Finding effective and acceptable approaches to managing international collaborations in a geopolitically turbulent world

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Foreword

In a world marked by rapid geopolitical changes and increasing international tensions, Swedish universities face new issues in their international collaborations. These issues require new approaches to internationalisation, and this report highlights the key reasons why this is necessary and suggests possible actions going forward.

The research presented in this report has been conducted on behalf of the government assignment on Responsible Internationalisation, which was given to The Council for Higher Education, The Swedish Research Council and Vinnova, Sweden's Innovation Agency, in 2023. The purpose of the government assignment was to propose national guidelines for responsible internationalisation, and to suggest a support function that can provide assistance for international collaborations in research and innovation. The study has provided essential input to the final report from the government assignment, which was delivered to the government on December 16, 2024.

The study confirms the dramatic change in the global research landscape over the past decades. While international research collaboration was once seen as purely positive, increased geopolitical turbulence and competition for scientific dominance have created new risks and challenges. Swedish universities must navigate this complex environment with a balanced and informed approach that captures the value of international collaborations, while protecting both academic freedom and national interests.

To effectively address these risks and challenges, the report stresses that a structured and continuous dialogue between academia, government, and other relevant stakeholders is required. By building mutual trust and understanding, a common ground for addressing the complex issues that arise in international collaborations can be created.

We hope that this report will serve as a valuable resource for all those engaged in international collaborations within the Swedish academic sector.

Opinions and recommendations expressed in this report are those of the authors.

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Authors' preface

The world is changing as we speak, and in several dimensions. The increasingly tangible effects of climate change, the continuing erosion of democracy, the growing number and extent of armed conflicts involving states, increasing geopolitical frictions, and the rise of disruptive technologies are forging a new order, the full ramifications of which we have yet to see and grasp. In such a volatile environment, it is particularly difficult but also particularly important to provide balanced and knowledge-based input and advice to help relevant actors and stakeholders make informed and timely decisions on international collaborations and engagement.

We would like to thank everyone who has provided input to this report. In particularly, we would like to thank the following for their excellent comments and feedback: Mats Benner, Professor, School of Economics and Management, Lund University, Andreas Göthenberg, Managing Director, Swedish Foundation for International Cooperation in Higher Education and Research (STINT), Ingrid Petersson, former Director General of Formas (A Swedish Research Council for Sustainable Development) and Chair of the Board, Lund University, and Astrid Söderbergh Widding, Professor and Vice Chancellor, Stockholm University.

Sylvia Schwaag Serger and Tommy Shih, November 2024

Summary

This report discusses how a rapidly changing geopolitical context is reshaping the context for international academic exchange, and more specifically Swedish universities. It explains why and how the context has changed and summarizes and assesses how higher education actors and governments have responded so far. It presents frameworks for understanding and developing suitable responses to the changing context. Finally, it makes some suggestions on how universities, governments and other relevant actors can respond effectively and appropriately to the changing context. Below we present our recommendations.

1. **Identify the problem:** While many actors contribute important insights and perspectives, it is integral that there is also a meta-understanding of the overall challenge lying ahead. This relates to the integration of matters such as openness, scientific advancement, academic freedom, finding solutions to global challenges, national security concerns, economic security, ethics, human rights, and democracy. A clear and common **problem identification** is needed through a continuous and structured dialogue between relevant parties (academia, government, agencies, and funders) that builds mutual trust and understanding. Examples of such an ongoing dialogue can be found in the Netherlands and the UK. It is integral that these dialogues are moderated and based on evidence and stringent analysis of current events and updated information.

2. **Substantial and structural investments in knowledge:** Identifying the problem and issue sets requires dedicated knowledge creation. Such efforts should combine and integrate different disciplines. Initial national responses have been guided strongly by experts on relevant countries (e.g., China) and national security, as has been evident in Europe and the US. While both areas of expertise are essential for designing responses, they need to be complemented with knowledge of research, science, and higher education systems and dynamics. Such a multi-disciplinary approach is also important for avoiding over securitization. Several initiatives are now under way to develop this knowledge foundation, but more is needed.

3. **Governmental guidance** ('vägledning' – i.e., guidelines) **and support** (support function). Due to the increased need to address national interests, government actors' guidance is needed to clarify expectations. But in order for government guidance to be effective, there is also a need for co-creation together with all involved stakeholders. Here national support structures play an important role, as has been evident in other countries. The process of aligning interests, to the extent that this is possible is a considerable challenge but can be helped by acknowledging and supporting recommendations 1 and 2. Support functions can also be seen as scaffolding structures. When and if not needed anymore some of the structures could be removed. Some important functions of a support structure include building a community of practice; invest in developing knowledge; and responding to direct inquiries.

4. **Combining defensive and offensive policies** (along with the "protect, promote and project" approach suggested by the OECD (OECD, 2023). To ensure long-term national security, countries need to combine efforts to protect the research enterprise from threats and foreign interference with appropriate investments in future scientific, technological and economic strength. The proportionality of measures/actions should be of the highest priority.

5. **Legal/rule changes or increased specificity regarding existing legislation**. (e.g., confidentiality and information sharing, student admissions, and screening). However, changes in the legislative sphere should be used with caution. There is already existing legislation that can be and is being applied to research and academic activities. Increased clarity of how these can be used separately and collectively needs to be better understood.

1 Introduction

In recent years tensions between scientific openness and national security concerns have become increasingly acute (European Commission, 2024a). As a result, concepts and terms such as responsible internationalization, research security, knowledge security, trusted research and foreign interference in research and innovation have become salient features of research policy in Western countries with advanced science capabilities (see JASON, 2019; UUK, 2020; STINT, 2020; European Commission, 2022; Government of the Netherlands, nd.; European Commission, 2024b). This report discusses how a rapidly changing geopolitical context is reshaping the context for international academic exchange, and more specifically Swedish universities.

Our analysis draws on primary and secondary sources, desk research and data analysis, and interviews and conversations with more than 100 experts, policymakers, researchers and university administrators in the Swedish but also other national contexts and at EU level. We have been studying the changing geopolitical context for international exchange and linkages in research, higher education and innovation for the past five years.[1] We have also advised and supported numerous agencies, higher education institutions (HEIs), governments and international bodies on these issues, as well as being directly involved in addressing these issues in university management.

Based on our analysis and insights, we provide some suggestions on how Swedish HEIs could navigate a more complex international landscape while safeguarding academic collaborations and what support could and should be provided by government and the public sector

The report is organized as follows. In section 2 we describe how internationalization has looked like until recently. Section 3 describes why internationalization is becoming increasingly contested by. In section 4 the Swedish policy context, and changes over time. Section 5 the forces that impact the possibility for Swedish actors to navigate in a turbulent landscape. The final section provides a discussion of lessons and recommendations.

[1] Among other things, Sylvia Schwaag Serger is currently leading a research project funded by the Marianne and Marcus Wallenberg Foundation on "International Science and Geopolitics". Tommy Shih has previously worked as senior adviser for responsible internationalization at STINT during the development of this report. He is currently leading the project "Developing State-of-the-art Knowledge on Responsible Internationalization" funded by STINT.

2 The post-Cold War period – an era of unprecedented and uncontested internationalization

2.1 Globalization

We are currently in the midst of a rather disruptive change in the international world order. Three key factors drive this change. First, several developments converge to slow down, even reverse, the continuous and perhaps historically unprecedented increase in international exchanges and interlinkages which has characterized the second half of the 20th century and beginning of the 21st century. Second, we are seeing a shift from a system dominated by the Western world - in terms of economic, military, scientific but also 'soft' power - towards a system where power, rather than being heavily concentrated among a few OECD countries, is being redistributed (Marginson, 2022). Third, the return of nationalism and authoritarianism on a grand scale, combined with the rise of polarization, both between and within countries and regions, has increased pressures, and incentives, to prioritize national interests.

In the aftermath of World War II, international trade flourished. After the end of the Cold War globalization became a widely accepted and promoted, even adulated concept, seen as a holy grail for efficiency, economic growth and prosperity. For science, globalization essentially meant that international co-publications exploded. Aksnes and Sivertsen (2023) show that "the share of publications representing international collaboration" grew from 4.7% in 1980 to 25.7% in 2021. Looking at individual countries, in most cases the increase is significantly higher.[2] For high-income countries, in 2020-2021, internationally co-authored papers accounted for more than half of all publications. In the case of Sweden, publications involving international collaboration increased from 19% in the early 1980s to 70% in 2020-2021 (Vetenskapsrådet, 2023). This development is comparable to e.g. Denmark, Netherlands, Belgium whereas the shares are lower for larger countries, e.g. 58% for Germany and 41% for the US. The increase in international collaboration has been more pronounced in natural and technical sciences than in social sciences and humanities (Aksnes & Sivertsen 2023).

Adams (2013) saw in the dramatic rise in international co-publications the emergence of what he coined "the fourth age of research", after the individual, the institutional and national ages, describing it as "international collaboration driven by elite research groups" (p.557). In a similar vein, Wagner (2018, p. 88) observed that "the early

[2] The share of international co-publications at country level is higher than when examining their share at global level due to the de-duplication effect (Aksnes and Sivertsen 2023).

1990s saw the birth of the global era for science and technology". In the light of this development, Wagner (2008, p. 2) argued that the age of "scientific nationalism" which characterized the 20th century was being replaced by the "rise of the invisible college", arguing that "[i]n the twenty-first century melting pot of science, national citizenship or allegiance plays a minimal role".

Several factors combine to explain the explosion of international science collaboration beginning in the late 1980s. These include the general shift from predominantly single authorship to multi-authored publications, the advancement of technologies conducive to knowledge sharing and cooperation (particularly digital technologies), the end of the Cold War, a general increase in R&D expenditure globally, and an increase in the number of countries spending more on R&D (Wagner, 2018). As a result, "[n]ot only has the proportion of article publications increased but also the number of countries that are engaged in international research collaborations has grown" (Haupt & Lee, 2023, p. 166).

2.2 Uneven internationalization

While international scientific collaboration has seen an unprecedented rise in the past three decades, it is important to bear in mind that the development has been strongly driven by a few countries or regions, and disciplines, particularly STEM fields. The global science landscape is still highly uneven with respect to qualitative factors and abilities to integrate science advancements in industrial activities. The development has been strongly dominated by a few countries, among other things by intra-European and Sino-US collaboration, and disciplines, particularly STEM fields. Regarding this observation, Aksnes and Sivertsen (2023) show that high income countries play a central role in international scientific collaboration. They also tend to collaborate strongly with each other and comparatively little with low-income countries. Figure 1 below depicts collaboration across income country groups for the year 2020-2021. It shows that high income countries account for the largest share of internationally co-authored papers, and they tend to collaborate most with each other, followed by collaborations with upper middle-income countries and lower middle-income countries. Overall, the income level of countries is positively correlated with their weight in international co-publications.

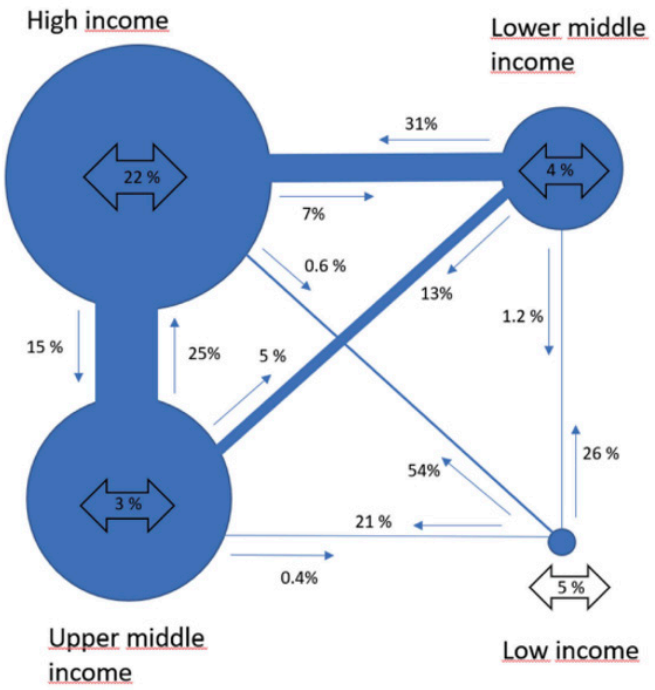


Figure 1: Collaboration patterns across country income groups, 2021-2021 (Note: The figure is from Aksnes and Sivertsen (2023, p.34), with obtained permission from the authors).

Moreover, while the share of publications involving international collaboration increased across the spectrum of research areas, some fields have significantly higher shares of international co-authored papers than others. Thus, according to Aksnes and Sivertsen (2023), in 2020-2021 more than one third of publications in biology, multidisciplinary journals were internationally co-authored, in humanities and social sciences the corresponding shares were only 11% and 22% respectively.

2.3 A changing landscape and the impact of China's rise

A striking feature of the international science landscape in recent decades is the rather dramatic shift in the distribution of knowledge resources from democracies to authoritarian regimes (The Economist, 2022) and from the West to the East (Schwaag Serger et al., 2021).

China has been the overwhelmingly dominant force illustrating this redistribution of scientific prowess. Figure 2 shows how publications involving countries such as China, Iran and Pakistan have grown considerably more quickly than those of countries such as the US, UK, Denmark or Sweden.

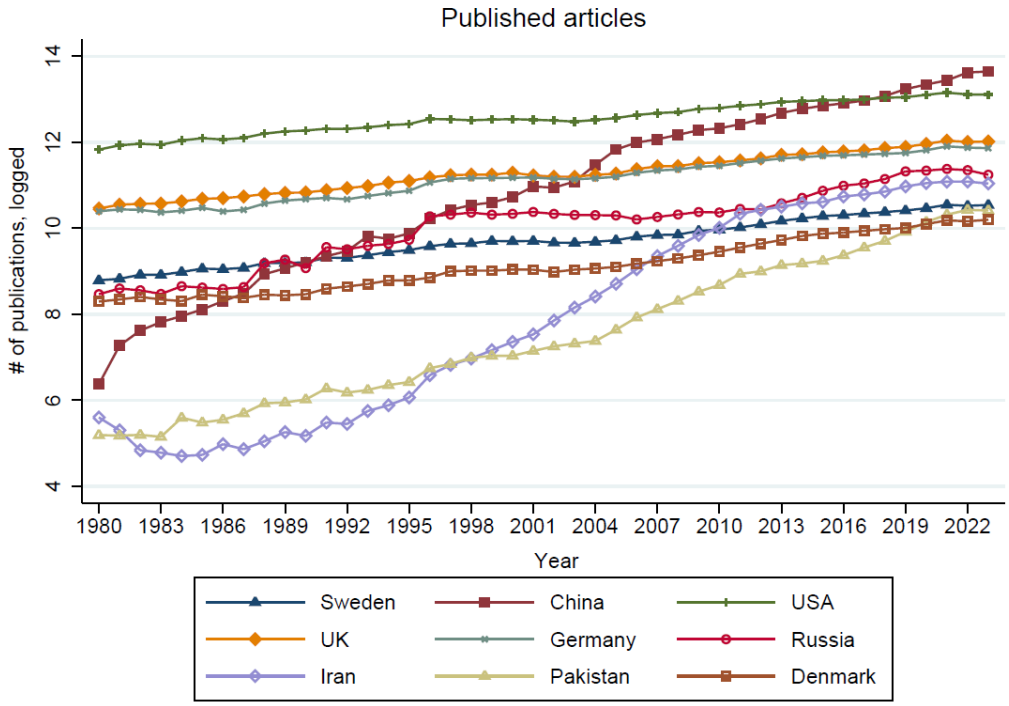


Figure 2: Published articles, selected countries, 1980-2022 (Note: The figure was made by Igor Martins, Lund University).

China's scientific rise, together with its re-opening to the world - after decades of isolation - have made it a central actor both in the global enterprise of science and in the growth of international scientific collaboration. Marginson (2021) and Haupt and Lee (2023) show the central role that US-China co-publications play in international academic collaboration. "China and the USA, the two largest science-producing countries, have for a long time emerged also as the most important scientific collaboration partners in the world, both in absolute numbers and in relative intensity" (Aksnes & Sivertsen 2023, p. 39).

Since the end of World War II and particularly since the fall of the Berlin Wall in 1989, international academic cooperation and exchange have been widely viewed as unequivocally positive and beneficial to science, to social and economic development and competitiveness and to addressing common challenges, such as fighting pandemics or climate change. Particularly, the period since the late 1980s can be described as an era of "unprecedented openness" (Benner, 2022). This openness in turn has led to the rise of what Wagner (2018) calls "The Collaborative Era of Science", which has had enormous benefits for knowledge creation, dissemination and utilization. However, as we show in the next section, this era is coming to an end, or, at least, certain developments look likely to slow down its momentum.

3 Growing geopolitical competition and contestation of scientific dominance

The redistribution of power is reflected in the decline of the advanced economies' share of global GDP, since the early 1990s, mirrored by the increase of the share of emerging and developing market economies, Thus, advanced economies' global share of GDP declined from around 60% to around 40% in 2023, while the corresponding share for emerging markets and developing countries rose from around 40% to close to 60% (IMF Data Mapper). In the same period, Europe's share of global GDP has dropped from a little less than one third to one fifth, at the same time as China's share has risen from less than 5% to a share that is only slightly below that of Europe.

Similarly to the change in the distribution of economic power, scientific power is also being redistributed. For example, in 1960 the US share of global R&D was 69%, but in 2020 the corresponding number for the US was 31% (Congressional Research Service, 2022). The relative redistribution of scientific power is not due to a decline in R&D spending in the US, but rather explained by the fact that other regions have dramatically increased their R&D spending. Global R&D spending has tripled between 2000 and 2020, with Asia's share of the global scientific enterprise growing significantly at the same time as the shares of North America and, to a lesser extent, Europe (NSF, 2022; 2024). Asia's increased role in global research and development is driven to a large extent by the dramatic, perhaps historically unparalleled, ascent of Chinese science: its share of global R&D spending grew from slightly below 5% in 2000 to close to 25% in 2020 (Congressional Research Service, 2022).

3.1 China's rise as a source of increased geopolitical tensions

Parallel with the economic and scientific rise of China, we are seeing an increase in geopolitical tensions. Rather than being isolated from each other, the two phenomena, and particularly the current friction between the US and China, interact in various ways and even mutually reinforce each other. As stated by the OECD (2023, p. 46), "[t]echnology is central to today's geopolitical competition". History shows that technological leadership is associated with military strength, economic leadership and control of markets, which in turn translates into soft power in the multilateral system (Shih & Wagner, 2024). The authoritarian political system of China significantly differs from those of other incumbent science powers, and advanced economies such as the US, the UK, Germany, and France. This has created tensions between liberal democracies and a strengthening authoritarian block of countries. With the rise of authoritarian political governance as an alternative to liberal democracy as an effective

development model, tensions at the geopolitical level have increased significantly (see Wagner, 2024).

Overall, we appear to be in the midst of a shift from a world shaped and even dictated by Western norms towards multipolarity. Combined with conflicting political ideologies, but also opposed views of both what the world order should look and like and what role they should play in such a world order, the result is a situation, where the established world order is being called into question. A result - and perhaps manifestation - of a changing world order is also a rise in armed conflicts. 2023 was the year with the highest number of armed conflicts since 1946 (see UCDP, 2024).

The era of geopolitical strategic competition is likely to intensify in the near future. Some commentators warn that the current rivalry between China and the US amounts to a "Thucydides' trap", i.e. a situation where a rising power (China) threatens the supremacy of an incumbent world power (the US), thus significantly raising the risk of confrontation and even war (Allison, 2017). At the heart of the competition seems to be a battle of technological leadership. With its clear ambitions to become a world leader in science, technology and innovation, and its impressive progress in achieving this goal, China is challenging the long-standing scientific and political supremacy of the US, and by extension, of Western democracies. Hence geopolitical competition coincides with a growing importance of science and technology for economic development but also national security and international influence, with all three factors mutually reinforcing each other.

Not surprisingly the context for international academic cooperation is also quickly changing. Geopolitical competition is forcing researchers, institutions and countries to re-examine and reconsider the premises, purposes and potential pitfalls of cross-border scientific collaboration. The above-mentioned shift coincides with the emergence of disruptive technologies, such as artificial intelligence, with far-reaching consequences for all dimensions of power. The competition over the mastery of these technologies further exacerbates geopolitical tensions, and particularly shines a stark light on international scientific and technological collaboration.

3.2 The rise of a multipolar world and strategic ambiguity

The rapidly and significantly changing context has produced a variety of reactions from decisionmakers, institutions and sectors. In countries such as Australia and the US, state actors have responded rapidly, even hastily and in some cases, one might say exaggeratedly (see Shih et al., 2024). In other countries, such as Sweden and Finland, state actors such as Sweden and Finland have responded more slowly, cautiously or reluctantly (Shih et al., 2024; Mäkinen, 2024). Recent studies (see Fjaestad & Gåsemyr, 2024; Grasten & Haakonsson, 2024; Shih & Forsberg, 2023; Shih, 2024a)

illustrate how countries[3] have different emphasis on national security aspects, and that the emphasis is highly correlated with the level of requirements/compliance measures for national actors. Figure 3 below illustrates the relationship.

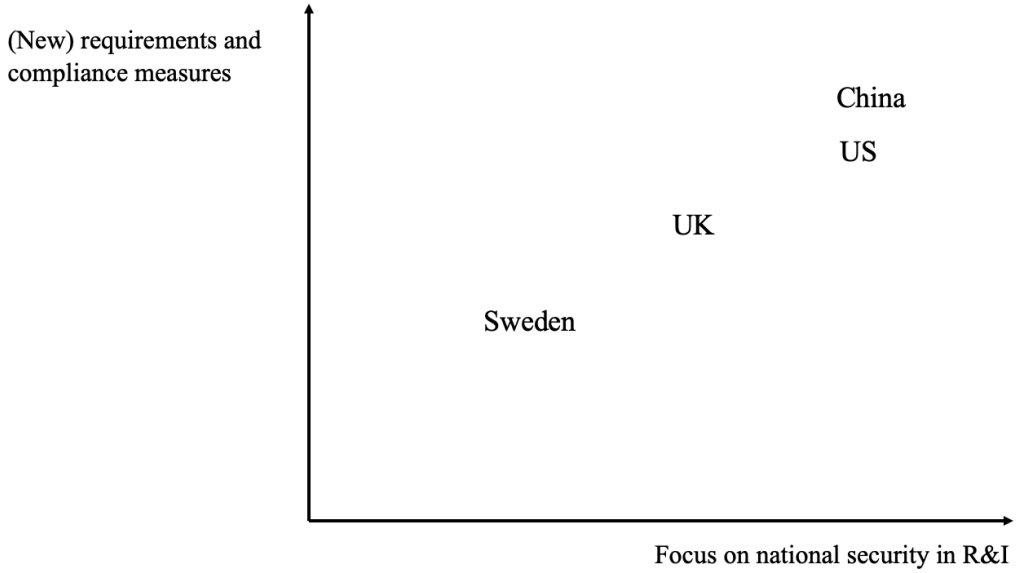


Figure 3: Relationship between focus on security and requirements for R&I sector

Figure 3 suggests that a significant change that has occurred in the wake of the changing geopolitical context is the rise of "securitization". The term refers to constructing various matters as a security concern (Buzan et al., 1998). As mentioned earlier, securitization has only recently become an important facet of the academic research sector. Over the course of a relatively short time span, security concerns have gone from rarely being considered by university researchers and administrations to becoming a salient feature of national narratives in relation to international collaborations. In recent years, the term research security has been used to characterize the need to protect or research, primarily from foreign actors and interests. While definitions of the term differ, the concept alludes that research findings are national resources used to create value for nations. The US National Science Foundation (NSF) was one of the early adopters of the term. The NSF started working with setting research security goals already in 2017 (NSF, n.d.). The EU, acknowledging challenges with 'unfettered' openness for the past few years, has increasingly emphasized the importance of research security. However, the EU was later in embracing and promoting the concept and only recently the European Council adopted recommendations to enhance research security (European Commission, 2024b).

[3] The studies have collectively looked at Australia, the Netherlands, Japan, the US, the UK, Sweden, Norway and Denmark.

Securitization is a response to a changing context in terms of ideology, geopolitics and technology. At the same time, it has far-reaching implications for society, and for science and scientific collaboration. It requires capacities, resources and instruments to respond to the needs for securitization without undermining fundamental freedoms and values that form the basis of the scientific enterprise, but also of democratic societies (for a deepened discussion see Shih & Wagner, 2024).

Overall, the above-described significant change in geopolitical context creates what Grasten and Haakonson (2024) refer to as "strategic ambiguity" with regard to international academic relations and collaborations. In their interpretation, the particular strategic ambiguity facing the Danish research system arises as a result of a rapidly changing world and new institutional context characterized by an increasing integration but also tension between different policy objectives and areas - such as trade policy, security policy, foreign policy and research policy. Examining the Danish national guidelines for international research cooperation, Grasten and Haakonson (2024, p. 47) argue that strategic ambiguity creates organizational ambivalence:

> On the one hand, it means that individual research institutions have more leeway to implement what the Danish authorities describe as a proper risk organization with clear chains of command for risk management. On the other hand, the interpretation process [of the national guidelines] is delegated down the organization to the individual researchers, who thus bear the real responsibility for implementation and adherence. This is a direct consequence of the ambivalent relationship between the importance of maintaining global leadership in knowledge and innovation, which relies on attracting an international talent pool (including from non-allied countries), and navigate a world order characterized by increased uncertainty and risks.[4]

Building on the paper by Grasten and Haakonson (2024) we see several meanings but also sources and implications of strategic ambiguity. First, ambiguity can be unintentional or intentional. The former arises when the government does not speak with one voice – in other words different ministries convey conflicting messages, for example the ministry of trade promoting trade with a certain country, while the ministry of security cautions against interaction with the same country. While unintentional ambiguity can occur when the government or other actors send mixed messages to constituents because they are uncertain, uncoordinated or in disagreement, sometimes ambiguity arises because actors actually intend to send mixed messages. An example of the latter is when the head of a government institute was told by a ministry official "we expect you to interact with China to know what is happening there, but we also expect you not to do anything that could be interpreted as harming our national interests". Second, government is not the only source of strategic ambiguity: we also see ambiguity emanating from research funders and academia itself. Third, and perhaps most

[4] Translated using Deepl

importantly, strategic ambiguity should not be seen as something necessarily bad that should be eliminated. It is also not unique to international scientific collaboration. There are many examples where actors must balance and manage a variety of objectives, which potentially conflict with each other, for example when the government asks its agencies to provide good public service while at the same time practicing budgetary restraint and avoiding overreach. Furthermore, strategic ambiguity, rather than being the problem, is a manifestation and consequence of the fact that international relations and international collaboration have become more complex, requiring new approaches, resources and institutional responses.

Thus, strategic ambiguity in international scientific collaboration needs to be managed. The unambiguous signals regarding open international collaboration seen since the end of the 1990s and until late 2010s are unlikely to return. The ambiguities now being conveyed to the academic sector by varied actors will need to be understood by academic institutions collectively. This largely entails safeguarding (defend), responsibly and proactively manage the discretionary space that will ensure a nuanced, granular and effective response to a more complex and challenging international context.

3.3 Responses by and for the academic sector

The effects of the changing context manifest in various ways. Perhaps most obviously, researchers, institutions and a number of countries are increasingly cautious or even concerned when it comes to international scientific collaboration in general and with certain countries in particular[5]. Whereas international cooperation was previously generally viewed as unequivocally positive, with numerous institutions and countries promoting internationalization across the board, governments now increasingly warn of national security and foreign interference risks of international engagements (see Australian Government, n.d.; European Commission, 2022). In Table 1 below, we identify some noteworthy examples of responses by or directed at the higher education sector.

The reports listed below are not exhaustive. Rather, they have been selected because they have been impactful in Europe and Sweden and have presented certain approaches and principles for how academic sector should handle the changing geopolitical situation. They include a variety of perspectives, framing and concepts, such as foreign interference, research security, responsible internationalization, trusted research, and knowledge security. They also reveal a trend towards convergence, particularly from the side of government and agencies around research security and economic security. The academic sector, in turn, emphasizes autonomy and advocates academic freedom under responsibility.

[5] Especially China, Russia and Iran that have been identified as threats to Sweden by the Swedish intelligence service.

Table 1: Examples of reports, guidelines, statements cautioning against certain types of international collaboration (topics, forms or partners)

Document	Issuer	Comments
Fundamental research security[6]	JASON (2019) (an independent science advisory group)	The JASON was commissioned by the NSF to balance the open research landscape with the needs for national and economic security.
Responsible internationalization: guidelines for reflection on international academic collaboration[7]	STINT (2020) (Swedish Foundation for International Cooperation in Research and Higher Education)	STINT's report was one of the first in Europe to address the need for researchers and HEIs to address in a systematic way the broadened portfolio of challenges in internationalization.
Managing risks in international research and collaboration[8]	Universities UK (2020)	The report was jointly developed with the National Protective Security Authority, and UK Research and Innovation (UKRI). The report outlined how universities can implement existing guidance to manage security risks in their international research and innovation.
Guidelines and standards in international university cooperation[9]	German Rectors' Conference, HRK (2022)	As a response to changes in the global environment, the HRK offered advice to the higher education system in Germany for critical evaluation and orientation. The HRK report addressed the needs and formulated guidelines and standards for the international partnerships of German universities.
Tackling Foreign Interference in R&I[10]	European Commission (2022)	The European Commission's staff working document provides direction, makes recommendations and contains tools on how research and innovation (R&I) actors should deal with foreign interference. It seeks to support European research actors such as universities, research institutes and companies to make sound decisions on R&I collaborations outside the European Union (EU). The Commission document aims to mitigate the effects of foreign interference in research and innovation within the EU.
National knowledge security guidelines	Universiteiten van Nederland, KNAW, Vereniging Hogesholen, NFU, TO2 federatie,	The national guidelines for knowledge security provides guidance to Dutch HEIs, and research performing organizations on managing risks in international collaborations.

[6] https://new.nsf.gov/news/nsf-announcement-jason-report-safeguarding

[7] https://www.stint.se/wp-content/uploads/2020/01/STINT_rapport_Responsible_internationalisation.pdf

[8] Managing risks in Internationalisation: Security related issues (universitiesuk.ac.uk)

[9] Guidelines and standards in international university cooperation - German Rectors' Conference (hrk.de)

[10] Tackling R&I foreign interference - Publications Office of the EU (europa.eu)

	Riksoverheid, NWO Netherlands (2022)	
Guidelines and tools for responsible international knowledge collaboration[11]	Norwegian Directorate for Higher Education and Skills and Research Council Norway (2023)	The national guidelines for Norway were developed to support the knowledge sector on how to manage risks in international collaborations. The guidelines connected to a website that is regularly updated.
Global responsible engagement: checklist[12]	Association of Swedish Higher Education Institutions, SUHF (2023)	Inspired by STINT's report from 2020. SUHF's checklist provides guidance to Swedish HEIs by identifying six different indicators to assess international collaborations.
Ansvarsfull internationalisering Delrapportering av ett regeringsuppdrag[13] ("Proposal for national guidelines for responsible internationalization")	Swedish Council for Higher Education (UHR), Swedish Research Council (VR), Vinnova (2024)	The first part of the Swedish national guidelines on responsible internationalization. The report identified a broad portfolio of considerations to make in international collaborations.
Council recommendations on enhancing research security[14]	European Commission (2024)	The council recommendations were accepted by all Member States in May 2024. The recommendations focus on the risks that European HEIs and RPOs face in international collaborations, and how they can be addressed. Principles for responsible internationalization are also part of the recommendations, including the need for continued international collaboration and proportionate responses.

Guidelines for responsible internationalization and research security have been developed by a range of actors, including HEIs, funders, government agencies and supranational bodies (e.g. European Commission). Over time it appears that national level guidelines are becoming more important. Reasons for this include the need for more authoritative documents and national coordination, the need for government funding to implement national level changes (as well as legislative frameworks), and the greater attention to national interests in research policy. What has been particularly noticeable are the references to national interests such as economic security and national security. The increased attention aimed at national interests and the necessity for HEIs to consider a broadened portfolio increases the ambiguity.

[11] Guidelines and tools for responsible international knowledge cooperation | HK-dir (hkdir.no)

[12] SUHF-Checklist-Global-Responsible-Engagement-REC.-2023-4-230411-REVISED.pdf

[13] Förslag på vägledande nationella riktlinjer för ansvarsfull internationalisering - Universitets- och högskolerådet (UHR)

[14] Council adopts a recommendation to enhance research security - Consilium (europa.eu)

Valuable insights on how to manage strategic ambiguity can be gleaned from countries outside the European or Anglo-American spheres. In particular, South Korea, provides an interesting alternative example of how a complex geopolitical context is navigated (see Box 1).

Box 1: South Korea – An innovative democracy navigating ambiguity **(Note: The text in the box has been written by Hyejin Kim (Lund University) and Erik Mobrand (Seoul National University).**

How should governments, universities, and research teams manage the balance between international openness and the imperatives of security? Various actors around the world have answered this question differently. South Korea's response can be useful to understand, because it is another democratic country that is driven by innovation and also increasingly squeezed between China and the United States. The response also diverges from what is better known globally from European and Anglo-American contexts.

South Korea is entangled in international science collaborations with the United States and China as the top two partners. These collaborations occur in the context of wider relationships with these countries. While the security relationship with the United States has remained close, China has over the past two decades become crucial for South Korea's economy. Signals from Washington to adjust interactions with Beijing thus put Seoul in a challenging position.

International science has in South Korea long been a national project for enhancing security. The peninsula's division and the failure of the subsequent war (1950-53) to resolve anything meant that national security was the top priority. Science grew in the 1950s and 1960s as part of efforts at national strengthening for the sake of security. A defence research institution, created after the Korean War, was the country's first public institution for science research (Chung 2009, 2). This organization served as the model for later science institutes in all fields (Yoo 2020). In other words, defence research set the paradigm for science. Scientific accomplishments, including in technologies such as nuclear power, were presented as symbols of national pride (Bak 2014, 163).

As South Korea industrialized and spent more on the development of civilian technologies, these efforts were also tied to national security. The purpose of industrialization, as presented by the country's leaders, was to enhance the security of the country vis-a-vis North Korea. Given this background, South Korean authorities developed an attitude toward innovation as something that must be both cultivated and protected. Intellectual property was one of these to catching up economically – and therefore enhancing security.

While for much of the industrialized world the end of the Cold War ushered in a period of openness in trade, investment, and science, the Korean peninsula was in a different position. The peninsula's division continued and tension between Pyongyang and Seoul hit emergency levels at points during the 1990s. Security remained a priority for South Korea. The country was certainly part of the globalization of flows in goods and innovation, but the end of the Cold War was not a big a turning point as it was elsewhere. South Korea's science remained oriented to economic growth and national security.

Even as the country assimilated into international research networks and became a liberal democracy, the value of international science has remained attached to national objectives. "Internationalization" of universities, as reflected in higher education ranking schemes, has become an indicator of reputation. It serves this instrumental purpose. Public discussion around international collaboration thus differs from Europe. Openness and cosmopolitanism in science are rarely celebrated as values in themselves. Rather, internationalism is a way of establishing or proving national value.

In South Korea, the growing external tensions of today have done little to prompt reflection on practices in international scientific collaboration. Authorities have always understood that the country operates in a dangerous world. Research security has not become a hot topic on university campuses or in the relevant ministries. While there is attention to protecting key intellectual property, this moment is not one of questioning internationalism or introducing measures to limit collaboration with foreign institutions. International science has not come in juxtaposition to security, so there is no perceived trade-off between these today.

There are caveats when thinking about South Korea's experience from a European perspective. The relationship between science and international collaboration in South Korea is not identical to that in Europe. The East Asian country's research environment is more domestic oriented, both in terms of funding and researcher recruitment. Institutional history and the legal framework also permit greater monitoring of research for security purposes. Still, the country offers an instructive example of remaining coolheaded under external pressure and avoiding the excessive measures that can result from seeing security as a threat to internationalism. It is possible to define international cooperation as fully compatible with national security rather than as something external and threatening to it.

In the international science landscape today, there are loud claims to see the world in black and white terms: the United States versus China, democracy versus authoritarianism, openness versus security. Yet as the body of this report points out, research institutions today face a range of ambiguities and contradictory signals. South Korea is no exception. Like many other Swedish partner nations, South Korea operates more in grey than in black and white. Finding ways to navigate the grey can be crucial for serving all values associated with the promotion and protection of science.

Every two years, the OECD publishes a "Science, Technology and Innovation Outlook", which "aims to inform policy makers and analysts on recent and future changes in global science, technology and innovation (STI) patterns and their potential implications on and for national and international STI policies".[15] In its 2023 report, the OECD noted a growing concern by countries with technology sovereignty and strategic autonomy and identifies three types of policy interventions that countries use to address this concern (OECD, 2023, p.47):

- *Protection: restricting technology flows and reducing dependency risks*, e.g. through regulatory policies like export controls, supply-chain diversification measures, etc.
- *Promotion: enhancing domestic innovation capabilities and performance*, e.g. through holistic innovation policies, mission-oriented innovation policies, national industrial strategies, etc.
- *Projection: extending and deepening international STI linkages*, e.g. through international technology alliances, active participation in international standards setting bodies, etc.

[15] OECD Science, Technology and Innovation Outlook | OECD iLibrary (oecd-ilibrary.org); accessed September 25, 2024

Box 2: Research integrity and security

In 2022, the OECD published a policy paper on "Integrity and Security in the Global Research Ecosystem". The report provided recommendations to countries and relevant actors for how "to safeguard national and economic security whilst protecting freedom of enquiry, promoting international research cooperation, and ensuring openness and non-discrimination" (OECD, p.5). It put forward seven overarching recommendations:

1. Underscore the importance of freedom of scientific research and international collaboration as a key element of the global research ecosystem
2. Integrate research security considerations into national and institutional frameworks for research integrity
3. Promote a proportionate and systematic approach to risk management in research
4. Promote openness and transparency in relation to conflicts of interest or commitment
5. Develop clear guidelines, streamline procedures, and limit unnecessary bureaucracy
6. Work across sectors and institutions to develop more integrated and effective policy
7. Enhance international information exchange on research integrity and security (OECD 2022, p.10).

3.4 Possible long-term effects

The broadening scope of factors that need to be considered in international scientific collaboration creates an undefined and changing space where a number of logics need to co-exist. Such logics include domains such as securitization, research excellence, global interests, national interests. etc. The tensions that result are obvious, and the effects of those are also highly visible. We are for example seeing a decline in scientific cooperation between China and the US, particularly in certain disciplines, such as the computer sciences, (e.g. Martin & Schwaag Serger, 2023, Nature, 2023a; 2023b). Jia et al. (2024) conducted a study which showed that NIH's investigations of grant holders between 2018-2021 led to a decreased productivity of those scientists, especially the ones with China ties. The scientific areas impacted were also those where the US is highly competitive.

It is important to note that, while political and economic relations between the US and China are increasingly fraught with conflict and competition, not least over the mastery of core technologies, the two countries continue to cooperate closely academically. In the period 2021-2023, 21.5% of all US internationally co-authored publications had at least one co-author with a Chinese affiliation, making China its largest publishing partner. Similarly, the US was China's largest co-publishing partner, with publications with at least one author with a US affiliation accounting for 30.4% of its total internationally co-authored publications.[16]

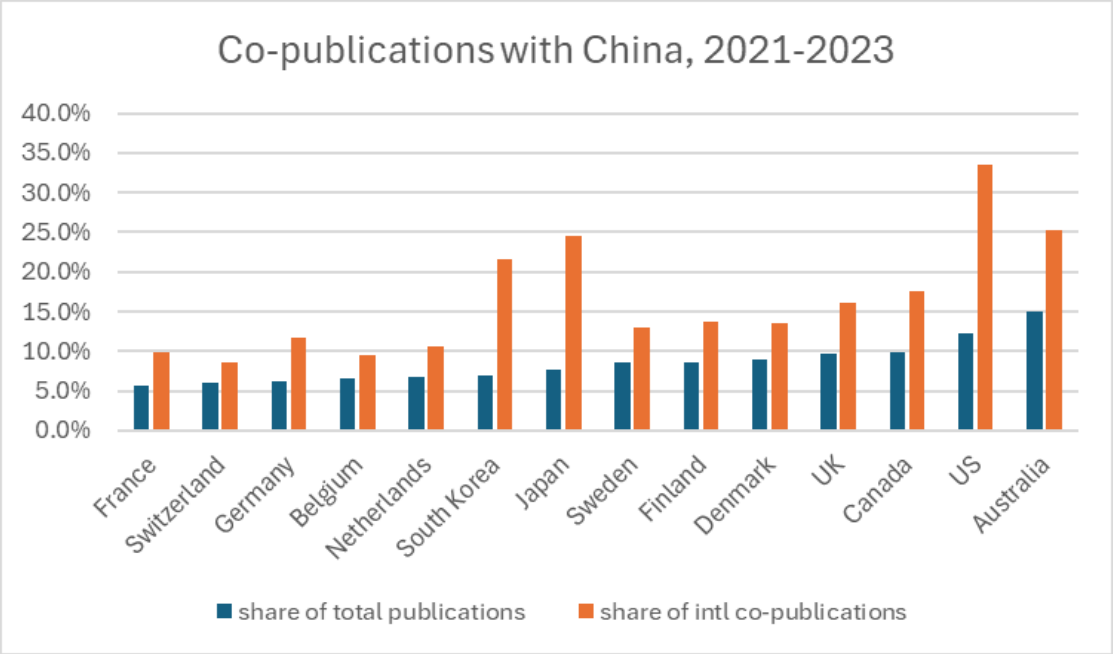
[16] Data from Scival, accessed August 25, 2024

Table 2 below shows selected countries' co-publications with Chinese authors, as well as their largest publication partners. EU countries tend to collaborate primarily with each other and other mature democracies. In comparison, China is a more important cooperation partner for Australia, Canada, Japan, South Korea, the UK and USA.

Table 2: Co-publications with authors with Chinese institutional affiliations, selected countries 2021-24 (Note: The data was retrieved from SciVal, August 6, 2024).

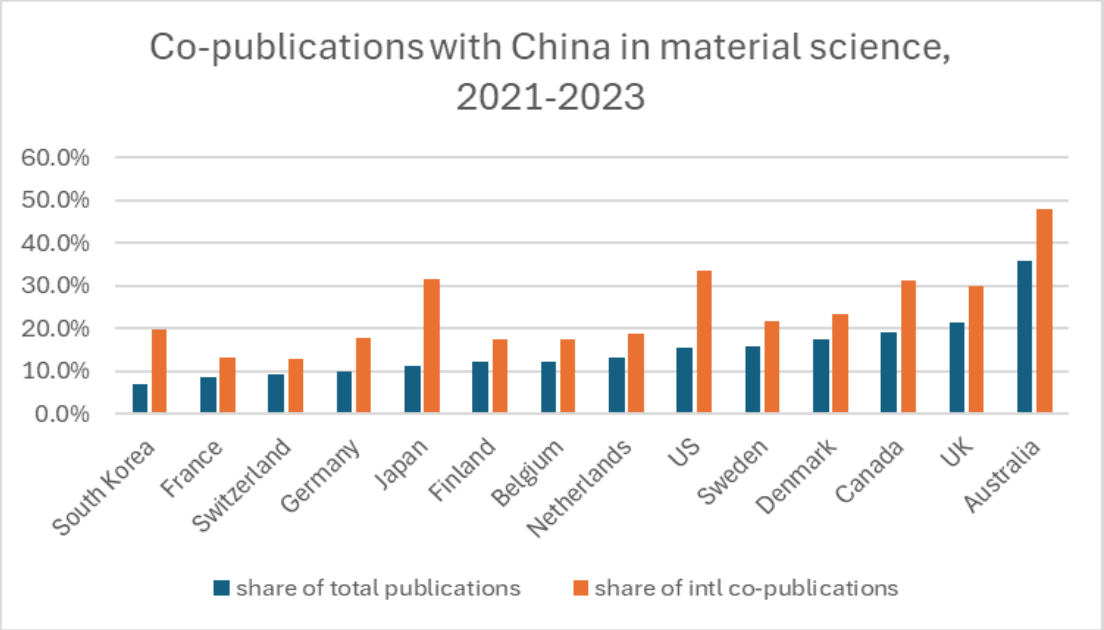
Country	Total co-publications	Co-publications with at least one author with Chinese affiliation	Share of internationally co-authored papers with at least one author with Chinese affiliation	Top collaborating countries
Australia	269724	69475	25.8%	US, China, UK, Germany, Canada
Austria	82645	6412	7.8%	Germany, US, UK, Italy, Switzerland
Belgium	105335	10403	9.9%	US, UK, France, Netherlands, Germany
Canada	271718	48373	17.8%	US, China, UK, Germany, Australia
Denmark	87277	11889	13.6%	US, UK, Germany, Sweden, Netherlands
France	269921	27092	10.0%	US, UK, Germany, Italy, Spain
Germany	396203	47501	12.0%	US, UK, Italy, France, China
Italy	271969	21963	8.1%	US, UK, Germany, France, Spain
Japan	126369	40567	32.1%	US, China, UK, Germany, France
Netherlands	174548	18683	10.7%	US, UK, Germany, Italy, France
Poland	87546	9505	10.9%	US, Germany, UK, Italy, France
Spain	223834	16949	7.6%	US, UK, Italy, Germany, France
South Korea	125242	27489	21.9%	US, China, India, UK, Japan
Sweden	123315	16248	13.2%	US, UK, Germany, China, Italy
UK	539939	89612	16.6%	US, China, Germany, Italy, Australia
US	996512	213492	21.4%	China, UK, Canada, Germany, Italy

To better understand both the concerns of different countries and the effects of their actions, it is helpful to examine the extent of their scientific cooperation for example with China, not just as a share of total international co-publications, but also as a share of total publications. This is because there are considerable differences in the degrees of internationalization of countries' research enterprise. Thus, Graph 1 below shows that co-publications with China account for a relatively large share of internationally co-authored papers in South Korea and Japan, while they account for a comparatively small share of each country's total publications. In the US and Australia, they account for a considerable share of both internationally co-authored publications - more than one third and one fourth respectively - and total publications - 12% and 15% respectively. Thus, China seems to play an important part in both the overall research output and the international scientific cooperation of the latter two countries. China is among the top two collaboration partners for Australia, Canada, Japan, South Korea, the UK and the US, whereas for most continental European countries it ranks between 5 and 10. China is a slightly more important collaboration partner for Sweden than for the other continental European countries except for the UK, ranking third.



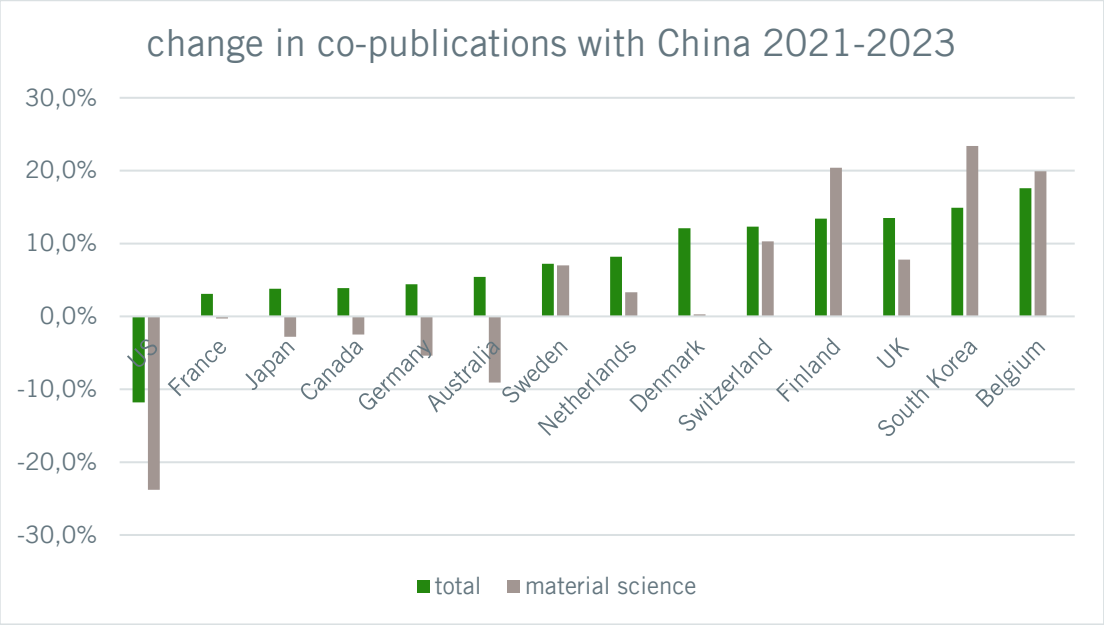
Graph 1: Percentage of co-publications with China for select countries (Note: The data was retrieved from SciVal, August 24, 2024).

Different patterns emerge when looking at specific disciplines. Material science is a field characterized by a high degree of international cooperation and where China is now one of the strongest research performers globally. In Graph 2, we can see that China is among the top two collaborating countries for all countries examined, except for France and Switzerland, where it ranks third and fifth, respectively. In Australia, close to every other internationally co-authored publication and more than every third publication in material science has at least one author with a Chinese affiliation, whereas in the case of France, less than one in ten material science publications and 13% of internationally co-authored papers have at least one Chinese-affiliated author.



Graph 2: Percentage of co-publications with China for select countries in material science (Note: The data was retrieved from SciVal, August 24, 2024).

Comparing changes in collaboration with China between 2021 and 2023 across selected countries, the US has seen a dramatic and by far the largest drop in co-authored publications both in total publications and in material science publications, which declined by more than 10% and more than 20%, respectively (see Graph 3). In contrast, in Denmark, Switzerland, Finland, the UK, South Korea and Belgium, the number of publications with at least one co-author from a Chinese institution increased by between 12% and 18%. In material sciences, co-publications with Chinese-affiliated authors grew by 20% or more in Finland, Belgium and South Korea.



Graph 3: Percentage change in co-publications with China for select countries in material science (Note: The data was retrieved from SciVal, August 24, 2024).

4 Navigating the changing landscape and context for international academic exchange – the case of Sweden

4.1 Swedish tradition of openness and neutrality

Sweden has a long and strong tradition of international openness and exchange, in the economic as well as the scientific realm. Free trade and economic openness are widely viewed as a foundation of Sweden's prosperity and competitiveness (Sveriges Regering 2007). In addition, neutrality and 'non-alignment' ("alliansfrihet") have been a defining feature of Swedish foreign policy since the Napoleonic Wars (Kungliga Krigsvetenskapsakademin, 2015). As a result, Sweden has not been directly involved in a war for over 200 years. These two defining features, a widespread consensus on the benefits of international exchange and trade, and its long-standing tradition of neutrality and non-alignment, have far-reaching ramifications also for Sweden's higher education sector.

Swedish, research and higher education policies have viewed and framed academic exchanges across national borders as creating value for national systems. The Swedish academic environment has benefitted from cross-border mobility and international exchanges. In 2023, 38% of academics based in Sweden were of foreign background. PhD students from Poland, Russia, Iran and China comprise the lion's share of foreign research students at Swedish universities and that stay in Sweden after finishing their PhD studies (Universitetskanslersämbetet, 2021). PhD students with a foreign background comprise one third of the total PhD student body, and the number is significantly higher for the STEM areas (Universitetskanslersämbetet, 2021). Overall, the statistics show the immense importance of mobility and openness for the academic sector. Regarding international research publications, 70% of Swedish publications had at least one author affiliated with an RPO and HEI outside of Sweden (Vetenskapsrådet, 2023). These were generally found in Europe or North America, but the number of co-publications with authors based outside of the Western sphere, especially in Asia, has continuously increased (Vetenskapsrådet, 2023). The numbers coincide also with a relative increase in the strength of non-Western science systems.

4.2 Policies have been driving openness in the academic sector

Every four years, the Swedish government adopts a bill ("Forskningspropositionen") which lays out the priorities for national research policy. These research bills have consistently emphasized the benefits and importance of international academic collaboration. Thus, for example, the 2012 bill highlighted the importance of cooperating particularly with China and India, arguing that:

> It is important that Swedish actors in research and innovation participate in the development and increase their collaborations with these countries to gain access to networks and new scientific knowledge, related research infrastructure, as well as new opportunities for innovation. Such collaborations also have great strategic importance for increasing the quality of Swedish research and for strengthening Swedish competitiveness and sustainable growth (Swedish government 2012, p.181).[17]

The research bill from 2016/2017 emphasized the importance of international collaboration and internationalization for tackling urgent societal challenges, to ensure high quality research and to further strengthen Sweden's international standing as a knowledge society. It also identified a need to improve the effectiveness and impact of Swedish internationalization efforts in and for the higher education sector (Swedish government, 2016). Following up on this identified need, in 2017, the Swedish government commissioned an investigation to propose new objectives and a new national strategy for the internationalization of Swedish higher education institutions. The investigation presented a range of proposals for strengthening internationalization at Swedish universities. Among other things it proposed to change the Swedish Higher Education Act ("Högskolelagen") to include a wording mandating them to "promote internationalization in higher education institutions" (Swedish government 2018, p.53).

In the 2020 research bill, internationalization was mentioned 111 times. Echoing the view of both the internationalization investigation and the previous research bill that there was a need to strengthen the effectiveness and impact of Swedish universities' internationalization efforts, the government announced its plans to task relevant Swedish government agencies with creating a platform for internationalization. The purpose was to create a long-term structure for the coordination of questions affecting internationalization in higher education, research and innovation (Swedish Government 2020, p.184).

[17] Original text: "Kina och Indien satsar stort på forskning inom naturvetenskap och teknik som underlag till framväxten av en högteknologisk och kunskapsintensiv industri. De gör även stora innovationsrelaterade satsningar. Det är viktigt att svenska aktörer inom forskning och innovation deltar i den utvecklingen och utökar sina samarbeten med dessa länder för att få tillgång till nätverk och ny vetenskapligt baserad kunskap, relaterad forskningsinfrastruktur samt för att få nya möjligheter till innovation. Sådana samarbeten har även stor strategisk betydelse för att öka kvaliteten i svensk forskning och stärka svensk konkurrenskraft och hållbar tillväxt" Regeringens proposition

In summary, up to and including the research bill presented in 2020, globalization or internationalization was regarded as something principally, even exclusively, positive, for Sweden in general, and for research and higher education and universities in particular. A perusal of the key policy documents regarding the higher education sector reveals essentially no mention of potential downsides to or risks with internationalization in higher education. This is not to say that the view reflected in the above government commissions was wrong, but rather that it, or rather that its context, have shifted significantly.

Perhaps the first sign of a shift in government stance on internationalization of higher education came in 2019, when the government presented a White Paper or *Government Communication* entitled "Approach to matters relating to China" (Swedish Government 2019). In it, there is, to our knowledge, the first mentioning that international cooperation in research and higher education could entail risks. In particular, while reiterating the importance of Swedish actors' interactions with and presence in "advanced education, research and innovation environments in China", it stated:

> cooperation with China involves particular challenges in relation to ethics, academic freedom and intellectual property protection, and to links to China's military sector regarding, for example, the possibility of transferred technologies being used for military purposes. (Swedish Government 2019, p.19).

The White Paper was preceded by an independent expert report commissioned by the government in 2018, to provide input to the government on how to strengthen cooperation with China in research and innovation. This input paper, written by the authors of this report, pointed to potential challenges or risks with cooperating with China, emphasizing that Swedish actors need to be aware of and weigh such risks against potential, and in some cases choose to abstain from cooperation (Swedish Government, 2018).

Overall, we would argue that Sweden and its higher education sector has taken longer than other countries to react to the changing context and its implications for higher education. This might partially be explained by Sweden's strong tradition and positive view of international openness and exchange and the long period of peace it has enjoyed.

4.3 Responses to a changing context

Several developments indicate a gradual shift in and towards the higher education sector with regard to international academic collaboration and challenges. In 2020, the Swedish Foundation for International Cooperation in Research and Higher Education (STINT) published a document entitled "Responsible internationalisation: Guidelines for reflection on international academic collaboration" (STINT, 2020). The document identified several dimensions that researchers should assess when considering engaging in international cooperation.

In response to the need for analysis and experience sharing, in 2021 Lund University, Karolinska Institutet, Royal Institute of Technology, Gothenburg University, Stockholm University and Uppsala University jointly established CASI – Coordinated Assessment for Strategic Internationalisation. Based in the administrative departments of these institutions, CASI sought to carry out joint analysis among member universities to better understand international academic cooperation in a geopolitically changing world (see Lund University, n.d.). In mid-2021, Karolinska Institutet (KI) also established an advisory board on internationalization. The purpose of the advisory board was to provide input and advice to the rector on geopolitical issues that may affect international academic cooperation. In April 2022 this group was transformed to become the "Global Relations Advisory Group" for the Association of Swedish Higher Education Institutions (SUHF).[18] The group's task was to advise the management of Swedish universities on international and geopolitical issues that can affect international academic collaboration, to offer knowledge support on the political and social development in relevant collaboration countries and regions and identify potential political consequences of universities' international activities, and to provide input on more general issues such as human rights and academic freedom[19].

Another initiative is Plint, the platform for internationalization. Plint was formed in Spring 2022 when the Swedish government tasked five government agencies with creating a cooperative platform with the aim to support HEIs in internationalization (UHR, n.d.). One working group was established on the topic of responsible internationalization. At the moment this group is dormant.

Starting in early 2023, a number of articles in Swedish newspapers started to report about 'problematic' academic cooperations between Sweden and China. In March 2023, the Swedish National Audit Office published a report on information security directed to Swedish HEIs. The report found significant deficiencies in universities' handling of sensitive data, concluding that:

- HEIs do not work effectively in identifying sensitive ("skyddsvärd") data
- they have insufficient knowledge and competence to assess what is sensitive or strategic information
- The leadership at Swedish universities has not governed and organized information security in an effective manner
- the government's and agencies' measures to improve information security at universities has been unsatisfactory.[20]

[18] SUHF:s rådgivande grupp för globala relationer - SUHF

[19] The group is composed of academics with expertise on different countries and regions (such as China and the Middle East) and on academic freedom and university autonomy, as well as the vice chancellors of several universities, including the Swedish Defence University, and the secretary general of the Association of Swedish Higher Education Institutions. As of August 2024, the group is chaired by the Vice-Chancellor of Lund University.

[20] Swedish National Audit Office (2023) 5. Slutsatser och rekommendationer | Riksrevisionen

In 2023, and in response to pressure by the government to act, SUHF published a checklist on global responsible engagement, which is strongly inspired by the STINT guidelines from 2020. In April 2024, the SUHF Global Relations Advisory Group published a position paper on "Higher education and international collaboration in a changing European and Swedish context".[21] The paper observed that:

> Our world today is in flux and some of the basic rules of conduct in politics, international and domestic, and society can no longer be taken for granted. These include the future of democracy, a consensus on the benefits of international collaboration and exchange, and the sanctity of personal rights and freedoms. Academic institutions are part of society and are thus affected by these trends as well. The purpose of this position paper is to map out some of these challenges that Swedish academia faces with a particular focus on international collaboration and suggest possible ways to manage them.

In April 2023, in connection with appointing external members to the boards of Swedish universities and university colleges, the government reduced the terms of these members from three years to 18 months. It justified this shortened term period with the changed geopolitical and national security context and the need to ensure that university boards had relevant competence in these issues.[22] In May 2023, the government tasked three agencies - the Swedish Council for Higher Education, the Swedish Research Council and the Swedish Agency for Innovation (Vinnova) with developing guidelines for responsible internationalization in education, research and innovation at Swedish universities. In September of the same year, it appointed a special investigator to assess how Swedish higher education institutions can strengthen their competence in security-related issues, with a particular focus on their boards (Swedish Government 2023).[23] In his report, published in January 2024, the investigator found significant shortcomings in how universities' and university colleges' handling of security issues (Swedish Government 2024).[24] He therefore recommended that the competence regarding security issues should be taken into account when nominating external members to university boards (ibid).[25] He also proposed amending the Higher Education Act to clarify that important decisions regarding security at universities should be made by the board. Furthermore, board members and vice chancellors should be offered competence-

[21] Position-paper-Higher-education-and-international-collaboration-April-2024 (1).pdf

[22] Swedish Government Offices (n.d.) Nya styrelser för 30 universitet och högskolor - Regeringen.se; see also SVT (2024) Regeringen vill halvera mandatperioden för styrelseledamöter på Sveriges universitet | SVT Nyheter, accessed September 24, 2024.

[23] Swedish Government Offices (n.d.) u2023-02485-bilaga-uppdrag-att-ta-fram-forslag-om-hur-universitets-och-hogskolors-kompetens-i-sakerhetsfragor-kan-oka.pdf (regeringen.se), accessed September 24, 2024

[24] Swedish Government Offices (n.d.) okad-kompetens-i-sakerhetsfragor-vid-universitet-och-hogskolor.pdf (regeringen.se), accessed September 24, 2024.

[25] Swedish public higher education institutions are mandated by law to have a certain number of board external board members. The government appoints two "nominating persons" for each university and university college to propose external board members.

building measures regarding security issues. Finally, he advised the government to look into setting up a support structure to support universities and university colleges but also individual researchers in security-related issues regarding international cooperation. In accordance with the investigator's recommendations, in 2024, the Swedish government changed the instructions to the 'nominating persons' - i.e. the people it appoints to propose external members of the boards to universities and university colleges (two persons per institution) - to take into consideration that board should have relevant security competence. It also passed a decision making it clear the university boards' overarching responsibility for the universities' security.[26]

As noted earlier, the Swedish higher education sector has been comparatively late in reacting to the changing context and its implications for higher education. We would like to point out that being a little late is not necessarily a bad thing. Rather it potentially allows Swedish actors to learn from other examples and to develop reflected, anchored and sustainable measures and approaches. Sweden's accession to NATO, the increasing friction between the EU and China and between the US and China, the ongoing war in Ukraine are likely to further increase the focus on security and national interests, and thus the pressure on Swedish universities to design effective responses real and perceived risks. These responses need to balance the benefits of international engagement and academic freedom against legitimate security, ethical and other concerns that arise from collaborating with countries and actors that could undermine Swedish security, democracy and other national interests. The latter is particularly important when considering how China strategically, often opaquely and in a zero-sum fashion, deploys an array of instruments to acquire foreign technology, restrict foreign access to its own technology, strengthen China's supply chain dominance and boost its domestic innovation and industrial capacity (see e.g. Arcesati, Chimits & Hmaidi, 2024).

Appropriate responses also need to be operationalizable and proportionate, providing effective guidance and support to researchers and instilling trust in and reassuring governments and society that universities understand and are willing and able to manage international cooperation responsibly. At the same time, they need to be reflexive - i.e. able to respond to rapidly changing circumstances, as well as being granular and nuanced. The latter is particularly important to avoid forgoing collaborations with countries and partners, that might be 'complex' but also offer substantial benefits to science, to tackling societal and planetary challenges, to economic development or to foreign policy objectives. As stated in the report by the high-level group on the EU framework program:

[26] Styrelserna vid universitet och högskolor får ett större ansvar för säkerhetsfrågor - Regeringen.se, accessed September 24, 2024.

> In a changed and complex world, European companies and researchers need to operate in key markets and cooperate with the best scientists even when they are in countries with which the EU competes politically, economically, technologically or militarily. They need to do so precisely to ensure Europe's future security, prosperity and competitiveness. They also need to manage potential risks with such collaborations and operate with caution, clarity and with purpose. This, in turn, requires different forms of and approaches to cooperation and new support functions to help assess and manage them, and to mitigate risks. (European Commission, 2024)

Finally appropriate responses to a new and complex international context also need to avoid being overly influenced by resistance to the rise of the scientific prowess and economic development of countries that are not fully aligned with Western values or interests. The US NSF (2024) noted:

> Staying at the frontiers of discovery requires leaning into internationalism. What are the most beneficial and strategic international collaborations, and how should they be sustained?

Acknowledging the fundamental benefit of scientific progress for people and the planet we inhabit and the universal right to development, as well as the fact that the overwhelming majority of international collaborations are benign and mutually beneficial, Swedish and European responses should welcome mutually beneficial cooperation, while identifying and containing the few, but potentially significantly harmful, damaging projects, interactions and initiatives. Developing and implementing such responses require resources, knowledge and institutional capacity. They also require a trust-based and constructive dialogue, interaction and mutual learning between academic institutions and the state, including security and defence agencies. In the following chapter, we delve more into what such responses could look like and how they could be developed and implemented. We conclude with some concrete recommendations to policymakers and HEIs and government agencies.

5 Forces that impact developing an effective and acceptable approach

5.1 Alternative narratives and policy frameworks

Two alternative narratives dominate in the Swedish discussion about academic sector responses to a more complex geopolitical setting and value creation under such circumstances. The first is related to **the need for increased securitization,** and the second one relates to **increased need for reflexivity**. In Figure 4 below the former is represented by the left-hand side, and the latter is represented by the right-hand side.

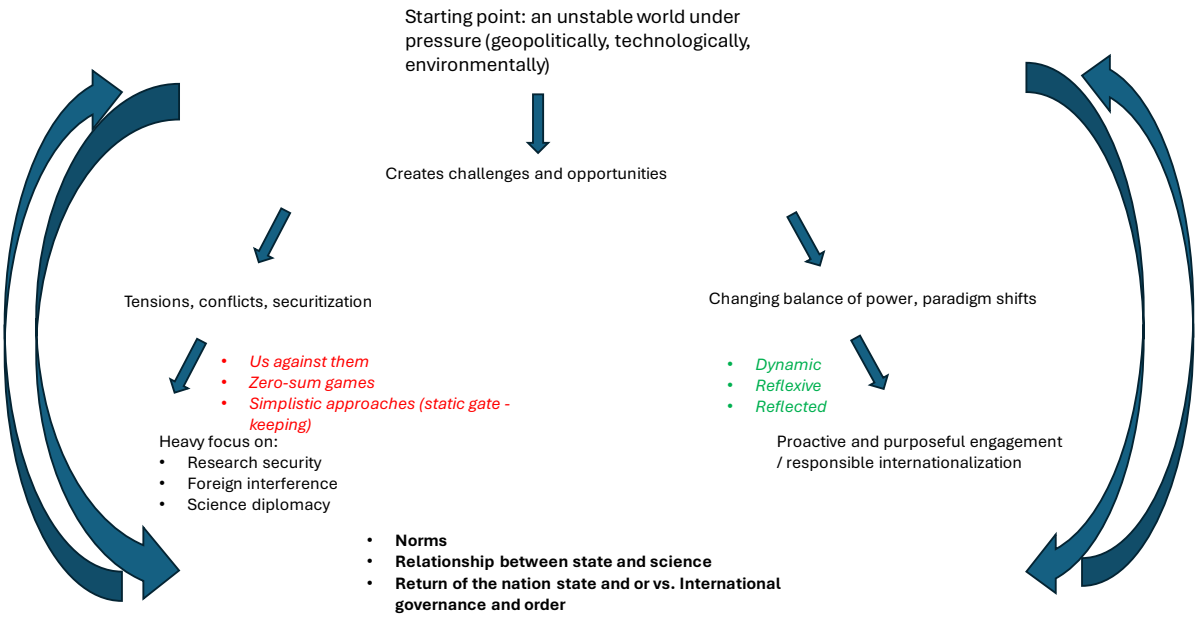


Figure 4: Dominating narratives and policy frameworks

The securitization narrative focuses on risks and threats to national research eco-systems, research organizations, and individuals at national institutions. The US NSF introduced the notion of research security in 2017 to manage risks associated with international collaborations and foreign interreference. Within the research security space, there are several expectations that need to be discussed. One issue concerns the notion of **absolute** or **total research security**. While this is seldom pursued as a goal by

itself, the discussion of securitization often comes with undertones of total research security, i.e., alluding to the goal that threats should be eliminated (Lindholm, & Salinen, 2023). The main question is whether this is a reasonable expectation without severely undermining the academic sector's openness, cultural underpinnings, and source of value creation.

There are several challenges to threat management, and at the same time, openness needs to be protected. First, the management of threats requires both reactive and proactive measures. The reactive measures require considerations of what the threats are, why they should be handled, what are mandates to handle them, and who is responsible for handling or dealing with them. Reactive management would need to answer these questions clearly. Proactive measures relate a lot to awareness raising. However, this is extremely difficult as the description of threats often focuses on whole countries rather than specific practices or risks. The proactive measures, thus, must rely on a more accurate description of threats. Second, we do not know to what extent the threats exist (see Dao et al., 2024). Without underlying information, how can they be handled? Is it up to universities? Third, the costs for handling threats are considerable in economic terms and for the academic enterprise as we know it. Fourth, the current threat management discourse in research and higher education suffers from a lack of problematization of how value is created in the first place.

The narrative focusing on reflexivity emphasizes the discretionary responsibilities that researchers and their institutions have in making informed decisions in international collaborations. The decisions need to me made along on a wide spectrum of considerations, including research integrity, ethics, equity, open science, academic freedom, and security concerns.

It is important to note that the two narratives do not mean that strategic choices are binary. Rather they seek to impact changes in the academic sector, the activities performed, and the resources utilized by actors through emphasizing different approaches. Hence, the integration of the two narratives is needed in the measures developed by national agencies, HEIs, and university leaders.

5.2 Guiding ideas

There are different logics driving research security and responsible internationalization measures. These are described in Table 3 below.

Table 3: Differences between responsible internationalization and research security

Aspect	Responsible internationalization	Research security
Focal unit of analysis	• The integrity of research networks. • Relationship-based.	• The integrity of the national research system.
The primary driver for change	• Discretionary responsibility.	• Compliance.
Point of departure	• Managing divergence in heterogeneous networks. • Value is created in the network.	• Creating convergence in a national research system. • Value is shaped in the national system.
Goals	• Reciprocity. • Avoiding grave transgressions. • Interdependence.	• Economic security. • National competitiveness. • Open strategic autonomy.

Most of the work that needs to be undertaken will not require compliance measures but the development of sound professional judgment. The grey area in Figure 5 below represents this.

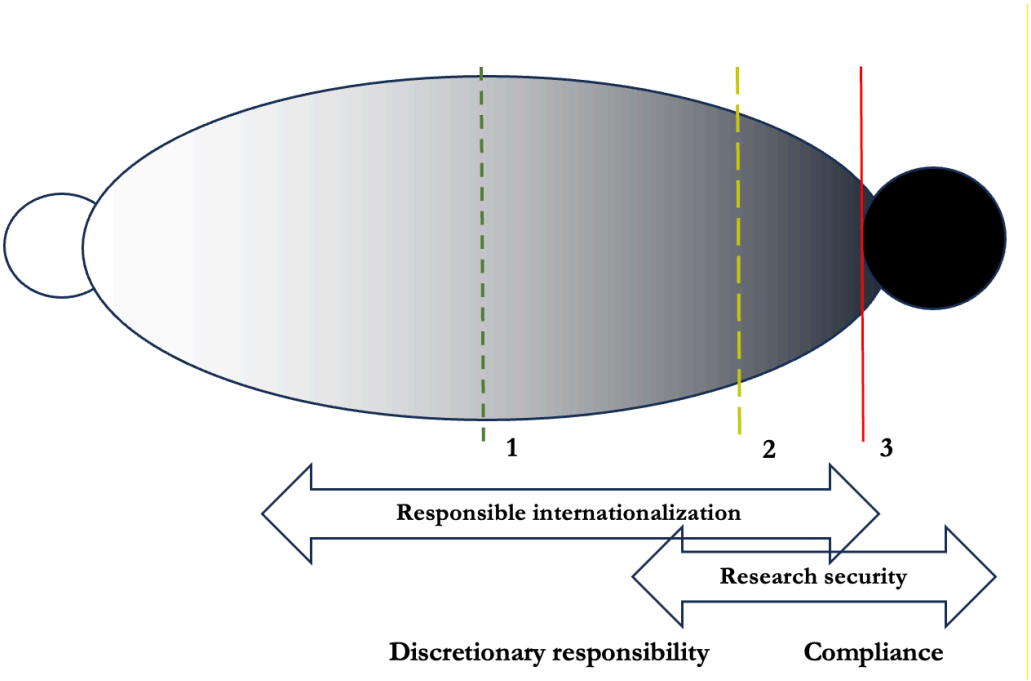


Figure 5: Responsible internationalization

Figure 5 (based on Shih, 2024b) illustrates how research activities are situated in different categories of appropriateness. Activities can be illegal or clearly transgress acceptable normative behaviours (e.g., highly unethical). Such activities can be categorized in the area right of the red line (3). Behaviours associated with crossing red lines fall in the space where compliance is often required. Research activities can also fall in the grey area (2). Behaviours here need to be informed by rules and professional judgment. Decision-making in international collaborations frequently ends up in the grey space area, i.e., where no clear answers exist to what is right or wrong (Shih & Forsberg, 2023). Hence, partners in international collaboration projects must be familiar with the risks and benefits of working across borders. Informed decisions need to be made by accounting for differences stemming from contextual differences.

As shown in Figure 6 below, the available space for managing international collaboration issues will range from legislation, rules principles to personal judgment. Generally, decision-making is based on discretion rather than compliance. A challenge with new legislation or too strict use of existing legislation is that it is difficult to draw back measures when they are in place or when precedence has been established. Since the overall understanding of the problem is not very clear with regard to geopolitics and international scientific collaboration it would also be prudent to not rely primarily on legislation unless clearly needed. As most activities in international collaborations will fall within a space that is not illegal or clearly transgress normative boundaries, most decision-making will be based on principles, for example, related to research integrity, respect for human rights, and academic freedom.

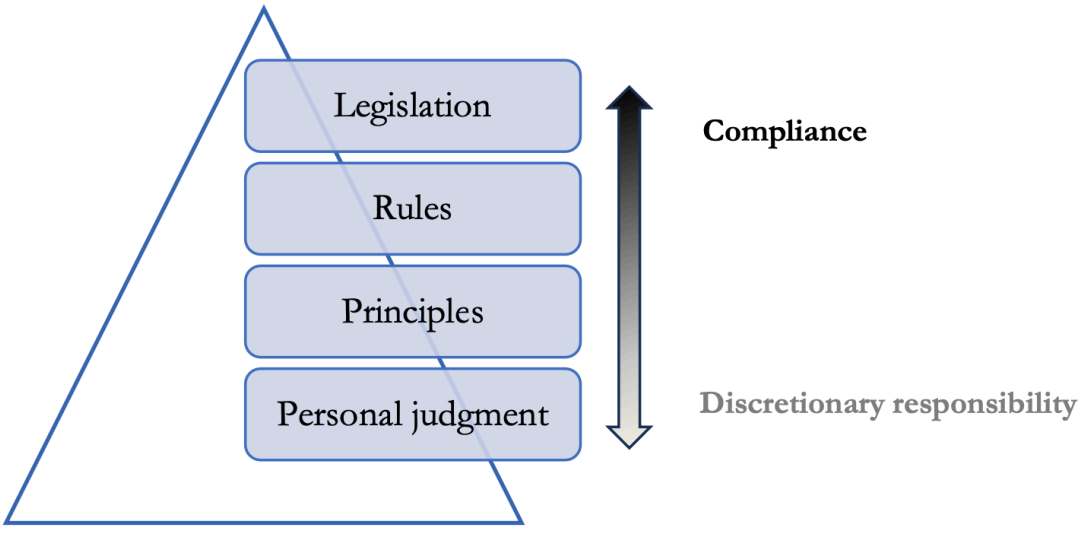


Figure 6: Guidance for decision-making

5.3 Factors impacting manoeuvring space

How the understanding of the different levels of the pyramid can co-evolve depends partly on the contexts in which risk management, routines, and norms can be developed. A slew of different forces impacts the manoeuvring space for Swedish HEIs in the current environment. These forces include the increasingly tense geopolitical landscape, the EU's push for economic security and open strategic autonomy, the recalibration of the state-HEI sector relationship in Sweden, and the internal dynamics at HEIs.

The geopolitical landscape: Current tensions in the global research and innovation landscape are heavily shaped by the competition between the US and China and Russia's invasion of Ukraine, which has put the limelight on European security in Sweden. National interests and self-reliance have increasingly become salient themes in science policymaking in advanced science nations. Significant measures have been taken in China and the US to protect national knowledge resources and industrial sectors, including critical and emerging technologies. The EU has similarly moved towards open strategic autonomy and derisking, emphasizing reducing dependencies. Hence, securitization and protection of economic interests are also becoming more explicit policy goals in Sweden. Generally, smaller knowledge- and innovation-based economies will need to adhere to the requirements being established by the power players. Sweden's accession to NATO will also move interests closer to those of NATO allies.

EU's internal dynamics: The EU has lately used a hardened narrative on China[27]. The upcoming US elections will also impact the EU's strategies related to self-reliance and autonomy. However, the work with research security in the EU is still evolving. The European Council's recommendations on enhancing research security from 2024 align with and were preceded by the EU strategy from 2023 to achieve economic security. The strategy was followed by five initiatives in January 2024. The initiatives included improved screening of foreign investment into the EU; stimulating discussions and action for more European coordination in the area of export controls; identify potential risks stemming from outbound investments in a narrow set of technologies; support research and development involving technologies with dual-use potential; enhancing research security at national and sector level (European Commission, 2024b).

National dynamics in Sweden: National dynamics also need to be considered in particular in order to develop feasible strategies. The relationship between different ministries and the dynamics that embed these interactions will influence the possibility of various solutions. A support function based on a whole-of-government approach, as seen in the Netherlands, will likely be challenging in Sweden due to the significant funding required and the arm's length distance to the academic sector of the government. However, a changing state-university relationship is seen. State actors'

[27] https://ec.europa.eu/commission/presscorner/detail/en/SPEECH_24_3510

intervention has increased in recent years. The most obvious example is the shortening of the mandate period for university board members. The increased pressure from government actors adds another layer of friction. The Swedish academic sector has responded firmly and argued that protecting academic freedom is of utmost concern.

SUHF (2024) has emphasized that Swedish HEIs are working on national security concerns, ethics, human rights, and personnel safety. However, the work with responsible internationalization is likely not something that can be single-handedly left to the HEI sector to manage due to the government and state actors pushing the academic sector to actively consider national interests. These national interests are best understood by those agencies and actors who are working with them on a daily basis. However, no one is more familiar with the structures and dynamics of HEIs and RPOs than those actors themselves. Hence, a process of balancing national interests with specific sectoral interests needs to be actively co-created. It is difficult to leave these matters to only one side to manage, as is the experience from other countries such as the US, the UK, Australia, the Netherlands, Norway, and Canada.

Internal organizational dynamics: Swedish universities, like those in many other European countries, are characterized by collegiality, which means that considerations for the organization's stakeholders are important in decision-making processes.

5.4 Support structures as mediators

In recent years, support structures have been developed to function as intermediary layers between a global context of growing geopolitical contestation that has made government policies more inward-looking and HEI's commitment to the pursuit of academic internationalization. Some examples include RCAT (UK), the National Contact Point for Knowledge Security (Netherlands), or KIWI[28] (Germany). While the national support functions are very different in nature, they generally seek to address several issues, including:

- Problematize: How can problems be solved if we do not know the problem? The problem formulation needs to address four layers: 1) Macro-level developments, 2) National interests, 3) HEI dynamics, and 4) The nature of international collaborations. The solutions need to be based on an integration of the three.
- Provide a forum to discuss meta-issues: Analysing the four layers together enables the identification of meta-issues. Failure to identify the relevant issues to be discussed on a broader arena means that solutions will continue to be developed in siloes or echo chambers.
- Provide an evidence base: More data will be needed to inform change.

In Sweden, there is a need to consider the underlying conditions that have been described in sections 4.1-4.3 when developing a national support function. Currently, evidence in Sweden and abroad shows that academic institutions need more support to

[28] https://www.daad.de/de/infos-services-fuer-hochschulen/kompetenzzentrum/

handle a broad portfolio of issues. These issues range from problem identification and information to building a culture regarding a new global reality, the need for new management models, and finding proportional responses.

The biggest challenge for HEIs arises from adapting to more pronounced national and economic security requirements. The academic community, particularly in Western Europe, does not generally view itself as a direct instrument of nation-building and being at the disposal of governments/politicians (or at least not explicitly); this makes the introduction of explicit national security ambitions a topic that is not easily received or managed. However, the impact of geopolitics is altering the underlying conditions for international exchanges. Here, academia is a vector that is seen by policymakers as an opportunity for economic growth and a risk for foreign interference (see European Commission, 2024b). Moreover, research and higher education are predominantly nationally funded and contribute to economic growth, welfare, and societal value. Hence, it has a strong connection to national policy goals. With increasing tensions in the geopolitical sphere, the risk that the research sector will increasingly become a bargaining chip in international negotiations and relations is overwhelming.

Hence, for the academic sector to handle matters pertaining to openness and securitization collectively, better organization, speed, and cross-functional and cross-sectoral intermediation are required. The developed structures should be able to manage the integration of national and sectoral interests. A hybrid model where government and academia are involved is probably needed. However, this requires that communication and co-creation work. A fully governmental support structure would not be able to consider the complexity of academic organization, and a fully academic sector-led support structure would not be able to fully understand the intricacies of national interests (about government actors' ambitions and needs).

Against this background, national intermediaries, such as those in the Netherlands, the UK, Canada, and Germany, interpret the intricate balance required between the openness of the research and HEI sector as well as the need for economic and national security. A "separated" and siloed way of managing the "new issues" stemming from a more complicated world will lead to suboptimal results in dealing with the challenges. Table 4 below provides examples of support functions seen in other countries.

Table 4: Support functions in the US, the UK, Australia, the Netherlands and Germany

	United States SECURE Center, and SECURE Analytics (2024)	**United Kingdom RCAT (2022)**	**Australia UFIT (2019)**	**The Netherlands NCP for Knowledge Security (2022)**	**Germany KIWI (2023)**
Placement	Universities	Government	Government and universities	Government	DAAD
Funding source	NSF	Government	Government	Government	DAAD and Department of Education
Primary stakeholders	Universities	Universities	Universities	Universities, RPOs	University, RPOs
Guidelines	No guidelines	Trusted research guidelines (MI5, and National Cyber Security Centre, 2019) UKRI has also developed Trusted research guidelines (2022)	Foreign interference guidelines (2019, updated 2021) Legislation: Foreign Relations Act (2020), UD	National knowledge security guidelines (2022)	2 reports by DAAD (for international collaboration, 2023; and China, 2024)
Main activities	Due diligence systems, awareness raising	Awareness raising, help desk	Awareness raising, help desk	Awareness raising, help desk, education	Awareness raising, help desk, education

6 Lessons and recommendations

In this report, we have examined the changing context for international scientific and academic exchange and the emerging responses in some countries, including Sweden. One of our most important conclusions, based on experiences from several countries, is that there is no quick fix regarding responding effectively and to the benefit of science, society, and security in the changing context of international scientific exchange and collaboration. The debate on responsible internationalization is frequently, and we would argue, unhelpfully, reduced to pitting academic freedom against security concerns. However, developing and implementing measured, appropriate and effective responses will require taking into consideration a broader set of issues in decision making processes, including those pertaining to openness, scientific advancement, finding solutions to global challenges, national security concerns, economic security, ethics, human rights and democracy. Integration of all these aspects into a collective portfolio will be challenging, but necessary in order to address challenges at the national and organizational levels. Our recommendations are as follow:

1. **Identify the problem:** While many actors contribute important insights and perspectives, it is integral that there is also a meta-understanding of the overall challenge lying ahead. This relates to the integration matters such as openness, scientific advancement, academic freedom, finding solutions to global challenges, national security concerns, economic security, ethics, human rights, and democracy. A clear and common **problem identification** is needed through a continuous and structured dialogue between relevant parties (academia, government, agencies, and funders) that builds mutual trust and understanding. Examples of such an ongoing dialogue can be found in the Netherlands and the UK. It is integral that these dialogues are moderated and based on evidence and stringent analysis of current events and updated information.

2. **Substantial and structural investments in knowledge:** Identifying the problem and issue sets requires dedicated knowledge creation. Such efforts should combine and integrate different disciplines. Initial national responses have been guided strongly by experts on relevant countries (e.g., China) and national security, as has been evident in Europe and the US. While both areas of expertise are essential for designing responses, they need to be complemented with knowledge of research, science, and higher education systems and dynamics. Such a multi-disciplinary approach is also important for avoiding over securitization. Several initiatives are now under way to develop this knowledge foundation, but more is needed.

3. **Governmental guidance** ('vägledning' – i.e., guidelines) **and support** (support function). Due to the increased need to address national interests, government actors' guidance is needed to clarify expectations. But in order for government guidance to be effective, there is also a need for co-creation together with all involved stakeholders. Here national support structures play an important role, as has been evident in other countries. The process of aligning interests, to the extent that this is possible is a considerable challenge but can be helped by acknowledging and supporting recommendations 1 and 2. Support functions can also be seen as scaffolding structures. When and if not needed anymore some of the structures could be removed. Some important functions of a support structure

include building a community of practice; invest in developing knowledge; and responding to direct inquiries.

4. **Combining defensive and offensive policies** (along with the "protect, promote and project" approach suggested by the OECD (OECD, 2023). To ensure long-term national security, countries need to combine efforts to protect the research enterprise from threats and foreign interference with appropriate investments in future scientific, technological and economic strength. With regard to defensive policies, the proportionality of measures/actions should be of the highest priority (for analysis and proposals regarding the need particularly for Europe to invest in future scientific, technological and strength, see, for example, Letta (2024), Draghi (2024) and European Commission (2024a).

5. **Legal/rule changes or increased specificity regarding existing legislation**. (e.g., confidentiality and information sharing, student admissions, and screening). However, changes in the legislative sphere should be used with caution. There is already existing legislation that can be and is being applied to research and academic activities. Increased clarity of how these can be used separately and collectively needs to be better understood.

The identified measures comprise a list of needed components. However, their configuration will differ depending on the national context, institutional factors, resources, and ambition. Countries and actors should strive for a well-composed portfolio where the different elements complement each other to achieve a holistic, integrated, and sustainable response. Together, the response will infer different levels of **institutional change**, for example, regarding the relationship between academia and the state or within academic institutions, including decision-making and knowledge- and information-sharing processes.

The elements described in recommendations 1 and 2 are both “must haves” and relatively uncontested and straightforward to implement. They are also prerequisites for achieving results within recommendations 3-5. The three latter recommendations are somewhat more challenging to agree upon and to achieve. They can happen to varying degrees and in varying combinations depending on national context and how interventionist the state wants, or thinks it needs, to act.

The above measures will require coordination, time, funding, and effort. However, not acting or implementing hasty, simplistic, or superficial measures also incurs significant costs and risks to both the state and academia in terms of credibility and legitimacy, attractiveness (to collaboration partners and talent), foregoing collaborations with high scientific, economic or strategic potential, and insecurity and frustration within and between institutions. Accompanying the above-identified measures, three approaches should guide any attempts to respond effectively, adequately, and successfully to the new context for international academic collaboration:

a) **Be proactive** in engaging with the issues**,** but base action on evidence and stringent analysis.
b) **Seek dialogue** and create a forum and a community for co-learning and evolution and professionalization of the response (Norway Dialogue meetings, USA, UK)
c) **Coordinate responses internationally** to achieve critical mass.

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