

Science, research, and United Nations Security Council Resolution 1540: The need of a “Wiesbaden process” for Academia

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ABSTRACT: The necessary link between export controls/academia/technology transfers has lagged behind in policy agendas: while weapons and dual-use goods are being channeled through very detailed regulations and export control regimes, knowledge transfers within scientific collaborations are subject to disperse and heterogeneous rules. The normative vacuum concerning intangible technology transfers in academia is a clear proliferating risk. History proves that many big proliferation networks have started precisely within peaceful scientific research projects.

In this context, dialogue with universities and research centers—on the basis of an increasing awareness of the sensitive nature of research and its proliferating risks—could pave the way for states’ further attention on the matter. This could be achieved through a structured dialogue between public actors—in particular export control authorities—and researchers. In order to preserve scientific freedom, a better understanding of each other’s needs, requirements and concerns should be in the basis of any regulation.

This article sustains a three-fold idea: first, basic export controls concepts might not be always suitable for science and research, thus needing a constant adaptation exercise where the active role of researchers and scientists becomes irreplaceable; second: UNSCR 1540 resolution offers a good framework in order to steer cooperation between national regulatory authorities, export control regimes and academia; third, the suggested interaction could take a form similar to the “Wiesbaden process” which has already proven to be a successful platform for interaction between governments and industry representatives.

The comprehensive review of UNSCR 1540, expected to take place in 2021, will contribute to shape the nonproliferation agenda for the years to come. It seems a good opportunity for setting up the grounds for this suggested dialogue between public authorities and scientists. This new process could be a tangible achievement of the Comprehensive Review.

KEYWORDS: Weapons of Mass Destruction, Non-State Actors, Nonproliferation, Export Control Regimes, Scientific Research, Intangible Technology Transfers, UNSC 1540, Wiesbaden Process.

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INTRODUCTION

The Swiss dramatist Friedrich Dürrenmatt once wrote: “The content of physics is the concern of physicists, its effect the concern of all men” (Dürrenmatt, 1961)¹. Almost 60 years after his sentence saw the light, it is still a precise formulation of this paper’s starting point: proliferating risks associated to intangible technology transfers, particularly in the field of academic research, and the potential enshrined in multilateral solutions in order to deal with them.

The trinomial “export controls/academia/technology transfers” has lagged behind in policy agendas: while tangible transfers (weapons and dual-use goods) are the object of clear-cut export regulations, intangible technology transfers –a frequent practice in scientific collaborations of any kind- have been dealt with on a less systemic way, leaving room for uncertainties and diverging interpretations. This can be explained in various ways:

First, while it is relatively easy to impose efficient controls on trade of material items, it is comparatively more difficult to regulate information fluxes. In the digital world, the immediacy of data transfers overturns any attempt to track them –needless to say to regulate them. This is particularly the case of academia, a world presided by a spirit of collegiality and a widespread *publish or perish* philosophy. This might explain why most scientists and academicians are generally reluctant vis-à-vis any attempt to have their activity monitored or regulated by external actors.

Second, setting boundaries to knowledge could also prove to have a political cost and face lack of understanding by the public opinion. In digital societies, access to new technologies is a key factor for economic and social development. Barriers to knowledge –even those cemented on powerful WMD nonproliferation reasons- might be seen as a way to perpetuate competitive advantages and undermine international cooperation;

Third, monitoring and controls of whatever nature could collide with two fundamental principles on which the very concept of university based: freedom of research and freedom of teaching. University, from grassroots head-to-head connections to large collective scientific projects, involving thousands of scientist and technicians, are deeply rooted in this scientific freedom. The case of CERN in Geneva dealing with particle physics –an eminently ambivalent field of knowledge- would be unthinkable without a mixture between a large degree of scientific autonomy and lack of interference by its member states.

A last reason is the mutual dependence between academia and private companies (Roeser & Jalabert, 2018). Researches often knock the doors of industry in search for financing, and *vice-versa*: the industry supports science and research -even fundamental research- due to its economic potential and profitability. Interference by the public sector in this industry/academia dichotomy by means of setting additional controls could be seen as a way to drain resources from research and impede this fruitful interaction.

Nevertheless, the risk is still there: however good willing or peace-oriented they might be, intangible technology transfers within research projects are no less prone to diversion, abuse or misuse than those happening in other fields, such as trade or security. History proves that many big proliferation networks have started precisely

¹ Friedrich Dürrenmatt wrote his satyric piece the *Pisicists* (*Die Physiker*) in 1961, against the backdrop of the advances in nuclear technology s well as the ethical dilemmas inherent to dual use research.

within pacific scientific research projects². That's why for scientists the motto "trust, but verify" should be of no less value than for industry representatives or members of our security forces. Export controls and regulations should never be considered as a limitation to scientific freedom, but as its ultimate guarantee.

This article sustains a three-fold idea: first, basic export controls concepts might not be always suitable for science and research, thus needing a constant adaptation exercise where the active role of researchers and scientists becomes irreplaceable; second: United Nations Security Council Resolution 1540 (from now on, UNSCR 1540) offers a good framework in order to steer cooperation between national regulatory authorities, export control regimes and academia; third, the suggested interaction could take a form similar to the "Wiesbaden process" which has already proven to be a successful platform for interaction between governments and industry representatives.

This paper will be going through the concept of intangible technology transfer (ITT) as applied to research and university; different national and international regulations offer various solutions to technology transfers, giving rise to uncertainties among users (academicians, researchers, international projects). We will afterwards focus on the normative basis offered by 1540, as updated by UNSCR 2325, and its potential in order to further dialogue with science and academia. We will finally give some hints on how could a dialogue scheme for universities be like, mirroring the model of industry/state dialogue successfully proposed by the "Wiesbaden Process", thanks to the initiative of Germany and UNODA.

THE CONCEPT OF INTANGIBLE TRANSFER AND DISPARITIES ON ITS REGULATION

An Intangible Technology Transfer (ITT) can be defined as the release of any piece of knowledge or dual-use information representing a progress or comparative advantage on a dual use technology. While tangible transfers are related to a physical item (essentially, weapons or dual use goods), intangible transfers are basically pieces of information (data). Data being released in a material container (such as printed or electronic documents and maps) will be referred to as *explicit intangible transfers*. If they lack such material platform (v.gr. a lecture, a research collaboration) they will be referred to as *implicit intangible transfers* (Stewart, 2016). Information technologies tend to dilute limits between explicit and implicit information transfers.

Explicit ITTs take place on a regular basis in any conventional trade relation involving private or public actors (i.e. sale of a dual use machine and a specific software designed to operate it). Implicit ITTs are less easy to categorize, since they can happen almost everywhere: from a technology import in the framework of a research project to a scientific symposium where sensitive information is shared or distributed among participants.

While explicit knowledge transfers in a research/academic context are subject to export controls (i.e. a software bought by a university in order to enhance the

² The findings about the A.G. Kahn nuclear proliferation network, back in 2004, spread concerns about non-state actors having access to WMD and dual use technologies. The global awareness about the risk of non-state actors having access to WMD technologies was the origin of the diplomatic exercise which eventually led to the adoption of UNSCR 1540. It is worth remembering that A.G. Kahn himself, before becoming a world scale proliferator, was a researcher with frequent contacts with a number of top universities in Western Europe.

performance of a robot) norms applicable to implicit ITTs are obey to a more heterogeneous normative, ranging from classical export control measures (adapted to scientific research) to specific migratory policies (i.e visa-vetting the participants in research projects involving dual use technologies).

Although almost all export control regimes extend to technology transfers their dual use goods regulations³, there is no single international regulation regarding implicit ITTs, and it should be reminded that even UNSCR 1540 itself does not pay much attention to this concept⁴. As regards national regulatory systems, while the solutions they offer notably differ in various aspects, the following common principles can be identified.

First, there is widespread consensus on how important it is to preserve scientific freedom from state interference⁵. That's why in almost all regimes ITTs in the framework of fundamental or basic scientific research are excluded from export controls⁶. Second, there is a shared view in the sense that, as far as *physical* trade (arms and dual use goods) is concerned, no exemption can be made for scientific research⁷. Third, it is commonly assumed that proliferating risks associated to ITT might go beyond conventional trade operations, and that's why many governments have established specific visa requests for researchers of certain nationalities participating in dual-use experiments⁸.

Departing from these common grounds, diverse and even diverging regulations reduce predictability and raise numerous question marks among researchers and educators. The following are just some cases where ITTs exports that might give raise to doubts and concerns.

³ The dual-use list of the Wassenaar Arrangement includes a General Technology Note which states that the controls also apply to transfers of technology, which is defined as the 'specific information necessary for the "development", "production" or "use" of a product'. The language of the scientific note of the Wassenaar Arrangement is very similar to that included in the EU dual use goods export control regulation (European Council Regulation 428/2009).

⁴ Although the Resolution does not explicitly mention Intangible Technology Transfers (ITT), they are included in the 1540 Matrix (as well as in some UNSC sanction resolutions).

⁵ That's the case of Germany, where the scientific freedom principle is enshrined at a constitutional level. "Arts and sciences, research and teaching shall be free. The freedom of teaching shall not release any person from allegiance to the constitution" (Basic Law For the Federal Republic of Germany, art. 5 c).

⁶ There are differences, though, on the exact meaning of basic scientific research, and therefore on the range of this exemption. The European Commission (Zigirevitz, 2017) defines basic research as "as experimental or theoretical work undertaken principally to acquire new knowledge of the fundamental principles of phenomena of observable facts, not primarily directed towards a specific practical aim or objective". This definition puts the focus in process and governance rather than in the nature of discoveries. The United States export authorities take a different perspective, based on results rather than in the process. As stated in National Security Directive 189 (NSDD189), fundamental research is "basic or applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research and from industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reasons."

⁷ In the US System, there is no possibility to apply the Fundamental Research Exemption to items (objects) traded in the framework of research. As per the Bureau of Industry and Security, the FRE does not cover the transfer of export controlled commodities abroad, which will be in any case subject to a licence.

⁸ In the United Kingdom there is a very developed visa scheme called Academic Technology Approval Scheme (ATAS) that requires that a student applying for particular subjects of study in the UK is required to apply for an ATAS certificate before applying for a student visa or extension. This normally does not affect undergraduate studies, where knowledge are of the public domain, but it may very well be the case in postgraduate studies, particularly in those that refer to listed technologies.

- An educational seminar carried out by an international cooperation organization in a third country. Given that the international organization itself would appear as and end-user and not as a mere intermediary, which entity should it be subject to export controls?
- A scientist being engaged by a university where the host country does not impose any kind of restrictions, and whose teaching and research would include a number of ITTs. Should he be subject to any kind of control in his country of origin/permanent residence, if the third country appears to be considered as risks for its security?
- An informal communication being sent between two colleagues of different nationalities in the framework of a research project on a dual use matter, which would not constitute an export but could very well contain an ITT transfer. Would it require any sort of authorization?
- A paper on a sensitive dual use matter being distributed in the framework of a research seminar on dual use matters where some participants belong to third countries. Would it be considered an ITT to the effects of export control regulations?

Needless to say, digital electronic information technologies make it more difficult to control ITT and easier to undercut customs enforcement.

1540 RESOLUTION AND THE DIALOGUE WITH SCIENCE: NORMATIVE GROUNDS AND ALTERNATIVES

UNSCR 1540, adopted by unanimity at the Security Council in April 2004 under chapter VII of the charter, aims at preventing non-state actors from acquiring nuclear, biological, and chemical weapons, their means of delivery, and related materials, thus filling a gap in international law by addressing the risk that terrorists might obtain, proliferate, or use weapons of mass destruction.

Even if its main implementing actors are the sovereign states, UNSCR 1540 offers a sound platform for specific dialogue between states and academia, for the following reasons: first, it was adopted by consensus by the Security Council, and this universality—a rare quality among proliferation instruments—confers it unquestionable legitimacy as a framework for an extended dialogue. Second, it is not a regulation on itself, but rather a set of goals that have to be attained by the states through their own means, thus giving room for self-regulation experiences and soft law instruments; third, it is not a *politically loaded* resolution, since it sets up objective implementation mechanisms (reporting requisites and matrices) that minimize any suspicion of political bias; fourth, it establishes a Group of Experts, many of whom come from academia or have a strong academic background.

While UNSCR 1540 does not pay specific attention to interactions with academia, Op 8 calls upon all States to “develop appropriate ways to work with and inform industry and the public regarding their obligations under such laws”. This provision is further strengthened by UNSCR 2325, adopted in December 2016 at the initiative of Spain and generally considered as an update of the initial resolution’s provisions. Reference to science, civil society and academia can be found in the provisions:

- 7. Calls upon States to take into account developments on the evolving nature of risk of proliferation and rapid advances in science and technology in their implementation of resolution 1540 (2004);

- 29. Requests the 1540 Committee to continue to organize and participate in outreach events on the implementation of resolution 1540 (2004) at the international, regional, sub-regional, and, as appropriate, national level, including, as appropriate, inviting parliamentarians, as well as representatives of civil society, including industry and academia and promote the refinement of these outreach efforts to focus on specific thematic and regional issues related to implementation;
- 30. Encourages the 1540 Committee to continue drawing on relevant expertise, including industry, scientific and academic communities, with, as appropriate, their States' consent, which can assist States in their implementation of resolution 1540 (2004);

Building upon this basis, Germany organized, on November 23th and 24th 2019, a meeting with representatives of private companies and civil society members aiming at increasing dialogue on the needs and requirements of the private sector to better contribute to UNSCR 1540 implementation. Later on, the Wiesbaden process has developed an interesting regional dimension: South Korea, Mexico and India have already adapted the format and held regional Wiesbaden Conferences in 2016, 2017 and 2018, respectively. This is a way not only to focus on local specificities of export controls, but also to allow states not always participating in all export control regimes to have a say on how to reinforce export regulations and face the risk of WMD technology spread.

While the scope of the “Wiesbaden process” was never limited to industry representatives, meetings have been so far oriented towards private companies and the challenges they face when complying with export control requirements. The complexities of ITTs in the framework of research and science are somehow of a different nature. Researchers and educators are far less familiar with export control requirements and basic export control vocabulary is not necessarily in the domain of research activities. That’s why a specific, tailor-made forum for science and research should be created, with the identic outreach purposes than the original Wiesbaden process but with a slightly different scope.

Some universities have already started walking the walk towards stronger interaction between academia and export controls, by either promoting outreach events⁹, publishing informative leaflets and other materials¹⁰ or by adopting themselves interesting self-regulations¹¹. Many US universities carrying out research on dual use research

⁹ This was the case of a workshop organized in London in 2014 by King’s College, London on “Preventing Proliferation through Intangible Technology Transfer and Balancing Academic Freedom and Non-proliferation: A Role for UNSCR 1540?”. Or the even more comprehensive forum held in New York in April 2016 -by the time of the last comprehensive review of UNSCR 1540- under the auspices of UNODA and the 1540 committee, called “dialogue with academia and civil society”.

¹⁰ Some European Universities have also made a remarkable awareness raising and outreaching effort, aimed at explain the regulatory framework for research in Europe. The publication entitled “Scientific Freedom and Scientific Responsibility: Recommendations for Handling Security-relevant Research” by the German Research Foundation (DFG), or the “guidelines for research on dual use and misuse of research” designed by the Dual Use working group of the Flemish Interuniversity Council in order to give some clarity to the impact of EU regulation on dual use items –in particular as regards technology transfers- and its impact on research are just two examples.

¹¹ Building on some of these efforts, The European Union made an important step ahead, through its framework program for research and innovation, Horizon 2020, where an emphasis is made on the importance of an ethics self-assessment of research projects submitted for funding, and the risk of dual use and misuse are underlined, and universities are invited to set up their own internal committees to assess those risks. The “Horizon 2020 self-assessment ethics guide” (July 2014) invites participants to

programs have established dual use committees and created the figure of export control official within their own administrative ranks¹².

HOW A WIESBADEN PROCESS FOR ACADEMIA MIGHT LOOK LIKE

Built on the grounds on the already existing initiatives and exchanges, a specific dialogue with academia –either as a branch of the Wiesbaden process or as an independent forum- could contribute to clarifying concepts and preventing misunderstandings. This matter could be brought to the floor at the initiative of a particular state, or as a result of a specific exploratory meeting, maybe in the UNSCR 1540 group of friends.

Participation in the dialogue should be as universal as possible, in order to preserve the consensus of 1540. The following groups of actors should take the lead in a conference:

- Sovereign states, as the ultimate responsible for the implementation of export control regimes, should have a central role. Those that are in the vanguard of scientific research should be taking the lead in discussions, in particular countries possessing the largest nuclear, chemical or biomedical sectors. The largest global exporters and regional leaders should have a prominent role.
- As for scientists, educators and researchers, with should be the big interlocutor of sovereign states in this dialogue, they could be represented either their own research centers and universities (some of the mentioned above could offer a good example), through their own international consortia, such as the International Association of Universities of the Global University Systems or through sectorial research associations, such as the Atomic Scientists Association or the Union of Pure and Applied Chemistry (IUPAC).
- Amongst international organizations and bodies, a preeminent role should be given to WMD export control regimes (Australia Group and Nuclear Suppliers Group, as well as MTCR, due to the increasing relevance of delivering vehicles in the WMD debate) as well as the Wasenaar Arrangement¹³.
- Specific nonproliferation and disarmament bodies should follow, such as OPCW and IAEA, without prejudice of the preeminent role of UNODA and, of course, the 1540 committee itself.
- Regional organizations, in particular the European Union, could have an outstanding contribution, as well as universal organizations dealing with science (UNESCO).

Plenary Sessions –without prejudice to the holding of more restricted thematic workshops and panels- should be public and the floor should be open to NGOs, independent experts and any observer with a vested interest. Informality in the

appoint independent ethics adviser/ethics board, with relevant ethics and security expertise, to carry out a risk-benefit analysis of the intended research and to suggest appropriate safeguards to cover security risks (during, and beyond, the lifetime of the project) and training for researchers.

¹²The functioning of the dual use committee at the University of Michigan as well as other self-regulatory links can be consulted at the following link: <https://research-compliance.umich.edu/export-controls/management-control-plans-licenses/export-controls-review-committee-members>

¹³ The Wasenaar Arrangement issued in 2006 a catalogue of best practices for implementing ITT controls which expressly prescribes the need to promote self-regulation by academia.

exchanges should be preserved and the setting of a realistic and comprehensive working agenda could help focusing the debate. The initial meetings could touch upon any of the following issues:

- The impact of export controls on academic research: differences and similarities among different national export control systems. Possible regulatory gaps.
- How to align export control definitions with specificities of education and research. Debates could crystalize in a sort of basic vocabulary where export control concepts (as well as others, such as a clear notion of fundamental research)
- Lessons learnt by universities and research institutes on self-regulation experiences (ethics committees, codes of conduct). A catalogue of best practices could be devised as an outcome for discussions.
- How to better structure and institutionalize dialogue between academia and international export control regimes.
- How to promote further outreach, in particular in Africa, South East Asia and Latin America. The involvement of UN disarmament and nonproliferation regional offices should play a key role.

The 1540 Resolution Group of Friends in New York would be an adequate forum for a first brainstorming exercise on this idea¹⁴.

CONCLUSION

As the 1540 committee acknowledges in a 2016 report “State actions alone may not suffice to achieve full and effective implementation everywhere. It also requires the participation and cooperation of all elements of civil society. This includes academia and other institutions that conduct research, educate, or promote dialogue on implementation of resolution 1540 (2004). The primary organizations that pursue these activities are universities and colleges and non-governmental organizations, including professional societies”¹⁵.

States hold the ultimate responsibility on setting up of export control regulations, and UNSC 1540 was designed not as a way to circumvent such national controls, but as a platform where they could co-operate and exchange information in order to strengthen their own regulatory frameworks. So far, though, governments have shown small regulatory appetite as regards Intangible Technology Transfers, in particular the field of scientific research. This is probably due to reluctance to interfere in the scientific sphere in a way that could be considered intrusive and politically oriented.

In this context, dialogue with universities and research centers—on the basis of an increasing awareness of the sensitive nature of research and its proliferating risks— could pave the way for states further attention on the matter. This could be achieved through a

¹⁴ This Group, created at the initiative of Spain when it held the presidency of the 1540 resolution, is an informal gathering of states designed to promote and develop UNSCR 1540 as updated by UNSCR 2325. 47 States took part in its first meeting, held on 27 April. After some promising first steps, with sessions held in New York and Vienna, the follow up has been uneven, but it appears to be a good forum to launch new ideas concerning this resolution.

¹⁵ The 1540 Group of Experts background paper for the Civil Society forum on 1540 and Academia, entitled *Resolution 1540 (2004) Events Organized by Academic Institutions and NGOs, 2010-2015*, April 4th 2016, can be consulted through the website of UNODA, the United Nations university and UNOG (<https://www.unog.ch/80256EDD006B8954>)

structured dialogue between public actors –in particular export control authorities- and researchers. In order to preserve scientific freedom, a better understanding of each other's needs, requirements and concerns should be in the basis of any regulation.

The Wiesbaden Process offers a good model for this interaction. It is an informal and flexible platform for dialogue with industry about export controls and UNSCR 1540. A new, parallel process, or a branch to the already existing one, could be open for scientists, researchers and educators. While the primary aim of exploring the potential UNSCR 1540 and its provisions, discussions could further be oriented towards how should Intangible Technology Transfers be regulated in the field of academia and how to prevent diversion or misuse.

The comprehensive review of UNSCR 1540, expected to take place in 2021¹⁶, will contribute to shaping the nonproliferation agenda in the years to come. It seems a good opportunity for setting up the grounds for this suggested dialogue between public authorities and scientists. This new process could be a tangible achievement of the Comprehensive Review: a much-needed evidence that UNSCR 1540 is a cornerstone of the nonproliferation regime as well as a living document, capable to generate its own working dynamics as well as some innovative ideas.

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¹⁶ UNSCR 1977 (2011).

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