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Science, technology and innovation diplomacy: a way forward for Europe

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Abstract

This policy brief explores how innovation becomes an increasingly important topic in international relations, with a deep impact on collaboration as well as on competition between countries. It analyses how the patterns of techno-economic change lead to changes in the global distribution of innovative activities around the world. It outlines three near future scenarios of the international politics of innovation. The first, called "populism and protectionism" describes an international environment which is becoming dominated by populist and nationalist tendencies. The second outlines the consequences of an approach of "innovation as a global public good", in which ultimately everybody benefits, and global collaboration is the dominant model. The third scenario is called "bottom-up innovation" and describes what happens to the international dimensions when large international firms and the regions in which they are based become the dominant forces. Together these scenarios describe the range of potential developments over the next 10 years. The final paragraph discusses what Europe can and should do in its external relations to provide adequate answers to the forces outlined in the three scenarios. It results in a vision, which is laid down in four policy directions: a) the European "open" model of research and innovation should remain the starting point; b) Europe should actively seek to build level playing fields for commercial, technological and innovation powers; c) Europe should identify and foster its technological strengths and the critical technologies that need special attention, both in offensive and defensive ways; and d) Europe must identify and spread the key social values and goals (e.g. in relation to quality of life, quality of labour, culture including privacy, and sustainability) that it wants to pursue in its internal and external innovation policies and collaborations. This vision must guide the development of an international innovation policy and the work of innovation diplomats.

Introduction

This policy brief seeks to develop a framework for analysing how foreign policies and diplomatic actions may influence the strength of European innovation and related businesses. It explores the consequences of developments in science, technology and innovation in relation to changes in the political and economic relations between nations for Europe's external relations and diplomatic activities. It explores how a "new technological order" and the recent falling apart of what appeared to be a relatively stable world order, force Europe to reconsider its international role and activities. It will first look at the changes that characterised the past 10 years. This will be followed by 3 scenarios that together describe the forces which are likely to determine the near future. A final paragraph discusses the consequences for Europe's international policy actions and gives advice for future policy directions.¹

Why should Europe worry about innovation and international relations?

The second half of the 20th Century was a period of steadily growing globalisation of firms and growing interconnections between national economies. With the rise of new and cheap means of communication (fax machines and later the Internet) and changes in transportation (e.g. containers) since 1980, it became increasingly easy to coordinate global activities in production and in trade (Ortiz-Ospina & Roser, 2018). Europe benefited from this globalisation by amassing a large trade surplus². Globalisation was generally seen as beneficial for everybody. Optimisation of industrial production at a global scale created huge growth opportunities in South-East Asia, China and South Korea. The flow of cheaper products to Europe and the US contributed to increasing living standards in these regions.

Rather suddenly, the picture changed. Between 2000 and 2005, China and Russia, after more than a decade of internal (re-)orientation, became more self-aware actors in international politics. Populism grew in Europe and the US. Following the financial crisis in 2008, foreign direct investment, which had grown from 4% of global GDP in 1990 to 23% in 2007, fell to just 6% about 10 years later. For the last five years growth in trade barely outpaced global GDP growth (Lund & Tyson, 2018). The rise of populist politics in Europe and the US, and to a somewhat lesser extent in Asia, has changed the political discourse about globalisation and related policy actions completely. In the West, globalisation is seen as the cause of many problems, like job insecurity, growth of low-income jobs, or no jobs at all, unwanted migration and migratory labour, and a general lack of opportunities to improve one's living conditions. The latest implication (mid-2018) is an outright trade-war started by US President Trump based on "America First" thinking and attempting to reduce the huge US trade deficit.

Techno-economic change

Without any doubt, ICTs are the most transformative technologies of the past 50 years. Technological developments have driven the costs of communication and processing of information down while at the same time improving on speed and processing capacity. In the process, demand for their key enabling technologies has grown at a very fast pace. This holds for networking (e.g. speed, capacity, mobility, accessibility), processing (again speed and capacity but also size and weight), capturing data (sensing, measurement) and for storage of information. This has contributed to ICTs becoming ubiquitous, entering all sectors of society and (almost) all aspects of personal life (World Economic Forum, 2015). ICTs are also playing a key role in other fields of technology (e.g. nano-, bio- or environmental technologies), determining their speed of development and the characteristics of applications. Most influential are two developments which both have firm anchors in the basic technologies. The first is networking of almost all aspects of life and the second is availability of data. The vision of seamlessly integrated ubiquitous computing will remain important over and (most likely) beyond the next decade (IEEE, 2014). Demand for faster and more flexible networking, mobility,

¹ The work on which this policy brief is based has been reported in two publications (Leijten, Exploring the future of Innovation Diplomacy, 2017) (Leijten, Innovation and International Relations: directions for EU diplomacy, 2019). Extensive quotations from these publications are used.

² "... the largest surplus for international trade in goods and services was recorded by the EU (+€304 billion in 2016) ahead of China (+€226 bn), while the United States had the largest deficit (-€456 bn). (DESTATIS, Statistisches Bundesamt, 2018)

processing and storage capacity will continue to increase at exponential pace, mainly because it allows doing things easier, faster, simpler and at lower cost. New types of applications building on machine-to-machine communications (e.g. self-driving cars), internet of things, autonomous robots, new display and interfacing technologies (including virtual reality, augmented reality and telepresence), artificial intelligence, speech and language processing, etc. will add to this increasing demand.

The second feature of ICTs also has become a dominant force in society: the capabilities of making data available and accessible, and of analysing them in such a way that they can be presented as sensible information. Nowadays, all kinds of human and non-human processes leave behind an enormous trail of data. Data-gathering, processing and analysis are expected to make major steps forward in the coming years, mainly through increased data-collection (e.g. the internet of things), better data availability, increased computing capabilities, and possibly also through the development and use of new automated learning systems and analytical algorithms (Artificial Intelligence).

The further development of networking and the growth of data will be accompanied by several societal challenges. Some of these challenges will be highly political (Who has access to what? How open or closed and dedicated will the networks be?) and may undermine the openness that has driven internet developments over the past decades. Trust will become an increasingly important issue when we start to depend on machine-to-machine communication (like in self-driving cars), but even more in relation to the personal data-trail. Networked technologies, their applications and the underlying data- and information-systems have become vital for the basic functioning of society and, in many cases have also become vital for our personal lives. But they also have led to changes in the structure of economy and society.

One of the key issues for international relations is that technological power (and the related social, political and economic power) is not evenly distributed around the globe. Such powers are concentrated in *innovation ecosystems, hubs, clusters or megaregions*, to mention just a few of the terms that are used in the literature to describe geographical concentrations of technological power. The combination of networked technologies and data leads at the same time to a stronger concentration of powers and to a deeper penetration of these powers into economic, social, and political life. In many countries, this is a reason for putting technology higher on the political agenda. But when this happens, we can also observe great differences in the way national policies want to regulate technology-based power. Even in the single European market, we can see major differences in the ways in which, for example, Uber and AirBnB are regulated. The regulatory differences may become even bigger when so-called ethical issues start to play a role (e.g. in relation to embryonic stem cells) (Regulation of stem cell research in Europe, n.d.). These developments contribute to the growth of an international field of negotiated collaboration or, in some cases, outright competition or power struggles.

Competition and power struggles

New technologies are thus putting innovation more firmly on the international agenda. Of course, issues of technology catch-up still play a major role in international relations, in particular for developing and/or lagging countries. But with the globalisation of networked technologies, these networked technologies themselves, their applications and the people and organisations that use them in all domains of society, have become one of the prime factors to drive changes in foreign relations and in foreign policies around the world.

The technologies that helped to build global networks have done their work so well that the global value chains that were mostly built over the past 30-40 years, have now reached maturity (Lund & Tyson, 2018). It has become difficult to find further efficiency gains by splitting production processes in ever smaller parts that each benefit from favourable conditions in specific localities. The maturity of value chains contributes at least partly to improving the conditions for re-shoring (e.g. bringing production back from China to Europe or the US) (Kinkel, 2015). As the massive off-shoring of production to China is a factor that drives current populist and nationalist tendencies (more so in the US than in Europe), the fact that it has become difficult to find further efficiency gains by another relocation may very well make the call for re-shoring more realistic than it was 15 years ago. Reshoring may also be helped by the further penetration of ICTs in the core of production processes through new technologies such as on-demand-production and/or 3D-printing. However, re-shoring does not automatically lead to growth and a stronger competitive position. Therefore, it should be firmly based on innovations. Indeed, very

often re-shoring goes together with a higher capital intensity, with higher levels of automation and with fewer jobs, to counter-balance for lower wages and other advantages elsewhere. Reshoring thus requires powerful political action. But it also requires careful political action. Globalisation has led to strong and often vital interdependencies in value chains. Disruption of even a small link in a supply-chain may cause serious problems in delivering the final products. In other words, reshoring may be presented as a solution to vulnerabilities (decreasing interdependencies with other places in the world), but it needs to be done in such a way that all critical elements in the value chain are considered. Politicians who want to follow this path risk resistance from firms and from other nations that depend on the value chain. They risk contributing to growing international tensions around the availability of specific technological knowledge and products.

In addition to their impacts on economic growth and competition, the new technologies also have a more direct political impact in international relations. Electronic warfare and other disruptive actions, spying through hacking or hidden applications, influencing politics and voting through social media interventions and fake news are all examples of how the new technologies may help a state to intervene in political processes of another state at a scale not seen before.

The location of activities in specific value chains and thus the location of innovative capacities has become subject of international power struggles. The growing dependencies of society on an increasingly wider range of technologies and related vulnerabilities are contributing these struggles. Globalisation and international collaboration are no longer the norm.

The problem for Europe

Globalisation and international collaboration were the norm up to around the start of the 2008 financial crisis. Many international governance bodies that helped to facilitate and promote such international collaboration were established in the second half of the 20th century. Over the years almost all these organisations took issues of technological development and innovation on their agendas. Many countries around the world established special offices or stationed so-called science and (later) innovation attachés in their embassies. Their main role was to inform and to explore opportunities for collaboration (Leijten, *Exploring the future of Innovation Diplomacy*, 2017). Gradually this role had also been taken up by the representations of the European Union, in this case focusing mainly on collaboration with the European Framework Programmes for research and innovation.

Ten years after the start of the financial crisis, the picture looks completely different. The international governance bodies such as the United Nations and the World Trade Organisation are rapidly losing authority and impact. Among the major players in the global arena US politics has made a significant turn away from internationalism towards a transactional approach. China has become an active player in the global arena with a keen eye for self-interest and a strategy which could lead to technological dominance and making an increasingly larger number of countries dependent (e.g. through loans and debts in relation to the Belt and Road Initiative).

Europe may still be seen as a supporter of international agenda setting and collaborative action, but this position is increasingly weakened by internal fights and ad hoc reactions to external pressures.³ Facing the tendencies discussed above, Europe lacks a consistent future-oriented policy view to guide its international policies. This is particularly problematic for innovation related issues and policies, because in this case the division of labour between Commission and Member States is unclear. In general, trade and commercial policies, which are highly relevant for (the diffusion of) innovation, are in the hands of the Commission. Many other relevant policy areas, such as environment, transport and energy, are shared competences primarily in the hands of the European Union. Foreign policies, security and research are also shared, but primarily in the hands of the Member States. Industry and education are fully in the hands of the Member States. Science, but even more so, technology and innovation have strong linkages to all these policy areas. Europe urgently needs a vision about its international science, technology and innovation policy position, to align with the Member States (not to mention the stakeholders), to clarify the division of labour and to guide the international activities from Commission and Member States.

³ This is, for example, illustrated by the development of Europe's position about collaboration with China in the field of solar PV over the past 10 years (Gehrt, 2018).

Foreign policies and science, technology and innovation: three scenarios

The basic premises for this policy brief are that the growing importance of innovation and innovation policies in foreign relations will drive changes in three areas:

- It brings new issues to the domain of science diplomacy which drive the change to innovation diplomacy. The importance of national economic interests in the field is growing and puts issues like critical technologies, trade in high tech products, IP ownership and protection, and standardisation on the foreign policy agenda.
- It leads to changing stakeholder configurations. Firms, their representative organisations, NGOs and local/regional public bodies are becoming increasingly important players in the domain of foreign policy.
- It leads to changes in the set of policy instruments and working methods relevant for STI diplomacy. A wide range of economic and social policy instruments relating to economic power is added to the field.

How these changes may take shape in in foreign economic policy and innovation diplomacy is explored in three scenarios. These scenarios build upon the forces that were analysed and described in the previous paragraph. The first scenario reads as a direct reaction to the combined populist and nationalist tendencies and is called “populism and protectionism”. The second could be read as a continuation of the strong internationalisation forces of the recent past in which innovation and growth are there for the benefit of all. In this scenario innovation is a “global public good”, which also provides the title of the scenario. The third scenario builds on a mixed set of societal and technological tendencies, which largely escape official politics, although they are in many cases supported by innovation policies. It is about the strength of networking externalities and the resulting push for globalisation by firms which operate in the new technologies. It goes together with the growth of the role of global companies and of the regions in which these companies operate in international relations. And it is about the consequences of user driven innovations in sustainable development, urban development, employment and other fields. This scenario is called “bottom-up innovation”. The scenarios do not intend to describe what will happen, but rather to explore what may happen when a specific force or tendency becomes dominant. In the real world, all three forces that define the scenarios will be present at the same time in a more or less stronger degree.

Scenario 1: Populism and protectionism

The first scenario is a direct response to populist and nationalist tendencies in politics. The difference between populism and progressivism does not follow the usual right-left distinctions in politics. The US based think-tank the Information Technology & Innovation Foundation describes the distinction between what they have called Tech Populism and Tech Progressivism in the following table (Atkinson, Castro, & McQuinn, 2015):

<i>Tech Populism</i>	<i>Tech Progressivism</i>
Appeals to emotion	Appeals to reason
Motivated by self-interest	Motivated by societal benefit
Distrusts the system	Trusts the system
Focuses on possible downsides	Focuses on benefits of progress
Distrusts government and business	Sees business and government as extensions of collective action benefiting society
Sees problems as “us versus them”	Sees problems as opportunities to work together

Table 1: The differences between populism and progressivism (source ITIF)

Protectionism seems to go hand in hand with populism. The focus on the national economy results in defensive or protective policies like raising import tariffs on certain products, limiting international scientific and/or technological collaboration, preventing the take-over of national “icon-companies” by

foreign investors, requiring local content to get access to markets, and many other policies.⁴ Such policy measures are likely to have considerable impacts on innovation. The effects on innovation diffusion around the world will be almost immediate. Countries with high barriers to diffusion of innovations, resulting from protective measures, will have to invest more to realise these innovations themselves. But in the innovation averse political environment, which comes with populism, it is unlikely that expenditures for innovation can be raised. Generally, a slow-down of innovation and growth is to be expected. Examples of innovation related foreign policies, which are inspired by populism and protectionism, can now be found almost everywhere in the world. We expect a growing pressure on foreign (economic) policy and the diplomatic services to become more defensive and driven by short-term self-interest, certainly compared to the period which lies behind us, in which they had a strong focus on seeking collaboration agreements and alliances.

Scenario 2: Innovation as a global public good

The second scenario can be read as a continuation of the strong internationalisation forces of the recent past in which innovation and growth are there for the benefit of all. There are two important views on this. The first one is the generic perspective which says that innovation builds on knowledge which is largely public and global, even if certain applications are privately appropriated and protected by patents (Stiglitz, 1999). It is the basis for companies to build the global value chains that deliver the global diffusion of innovations. The second perspective focuses on the development of innovations needed to solve global problems, for instance, as stated in the UN sustainable development goals (UN Department of Social and Economic Affairs, n.d.). International collaboration is needed to build the necessary knowledge, develop the technologies and realise these innovations.

Both perspectives have in the recent past led to major efforts to build international collaborations and institutions, partly with a global reach and partly with a focus on connecting specific regions, not to speak of the numerous bilateral agreements. Most of these are of public origin and nature, but not exclusively. There are quite a lot of private sector initiatives that at least partly work in the perspective of innovation as a global public good, by exchanging experiences, joint skills development, etc.⁵ Next to fully private initiatives there are also mixed public-private collaborations. The global challenges perspective has led to a large number of international initiatives to solve for example health and food problems. Together these initiatives cover the complexity of functions that need to be present in innovation systems, from developing the visions and organising funding to managing the diffusion of innovations.

At national or multilateral government level a few different models are “under development” and deserve further discussion. Consider the cases of China, Europe and the USA.

With its Open Science, Open Innovation and Open to the World approach the official EU-policy is without any doubt the most idealistic among the three examples. This policy is entirely building upon the vision of science and innovation as a global public good. And it is trying to spread the vision and approach.

The US has for many years been an important initiator and supporter of the global governance institutions. And even when the Trump administration seems to be dominated by a rhetoric of retreat and self-interest, there are abundant signs that the US wants to continue its policies of innovation as a global public good. But it is also clear that the US wants something (mainly manufacturing jobs) in exchange. The private sector which is seeking to bring innovations to global markets is an important driver for presenting innovation as a global public good in the US.

As a relative newcomer in the world of science, technology and innovation, China is still seeking its place, but it seems to be determined that this should be a leading place. It has a keen eye for self-interest and is not afraid to use its powers to build on its own strengths. As research and innovation gradually have become more important drivers in the Chinese economy, China has increasingly become aware of the importance to build strong relations with the rest of the world, to access knowledge

⁴ For several years now, the Information Technology and Innovation Foundation (ITIF) makes an almost annual and worldwide overview of protective policy measures that work as barriers against innovation (Cory, 2018 (January 22)).

⁵ The European Industrial Research Managers Association (EIRMA) which brings together the R&D and Innovation managers from about 80 leading companies, is an example of this approach.

and experience necessary for building its own strengths, and to help to create increasingly wealthy and advanced markets that may adopt innovative Chinese products and services.

In other words, there are sufficient tendencies in different countries or world regions to make the vision of “innovation as a global public good” a viable force, which can have considerable influence on the spread of innovations and related growth around the world.

Scenario 3: Bottom-up innovation

The third scenario builds on a few widely diverse societal and technological tendencies, of which the consequences are not primarily the result of official politics.

This scenario supposes that the strength of networking externalities and the resulting push for globalisation in many of the new technologies of today and the foreseeable future is becoming a dominant societal force. Sectors are dominated by a small number of large firms with a global reach. To preserve their monopolies or oligopolies these firms make considerable efforts to influence politics. They have their private diplomatic services (public affairs).

Another tendency that shapes this scenario is the growth of user driven innovations in sustainable development, urban development, (self-)employment and other fields, that will become very strong forces for change. Social networking allows global linkage and mutual strengthening of these initiatives. The third scenario also recognises that local politics is better than national government in picking up these initiatives and at incorporating them into their local policies. The vision that is behind this, as expressed in concepts like clusters and innovation eco-systems, may turn local government into a global actor, by facilitating the exchange of experiences with similar initiatives around the world or by facilitating connections with regions which contribute to vital parts of the local value network. This brings local and regional governments into the domain of international relations, economic and innovation diplomacy.

In the bottom-up innovation scenario the role of national government is mostly one of following and then supporting the local societal tendencies and strengthening the key actors.

Recommendations: policy directions for science, technology and innovation in Europe’s international relations

In the search for the elements which should define its international and global role, Europe must take account of these scenarios and their interplay. Europe has a history of searching for these elements, both as a general political power as well as specifically in the field of science, technology and innovation. This search can be found in several different vision and scenario documents, from the European Commission, from EU funded research consortia, from interest organisations and from think tanks.⁶ The vision document of the current European Commission shows that at present Europe’s starting point is firmly anchored in the “innovation as global public good” scenario: *‘Fostering international cooperation in research and innovation is a strategic priority for the European Union so that we can access the latest knowledge and the best talent worldwide, tackle global societal challenges more effectively, create business opportunities in new and emerging markets, and use science diplomacy as an influential instrument of external policy.’* (European Commission, 2016, p. 1)

Is such a strategy good enough when it is, for example, confronted with the Chinese strategies of technological leadership on the one hand and the Belt and Road initiative⁷ on the other? Or with the international strategy of the US, which seems to go in the direction of a pragmatic transactional approach? Is it strong enough to face populist and nationalist tendencies within the Union itself and elsewhere in the world? And is it strong enough to provide a framework in which bottom-up innovation can flourish?

It can be, but only if it is matched by a set of other policies that address issues related to the changing characteristics of competition in the international arena and that address issues brought forward by the

⁶ An abundance of such documents can easily be found online.

⁷ Even when the Belt and Road initiative lacks systematic translation into Chinese policy, it convinces other actors, including the European Commission, to consider taking action.

populist and nationalist movements. The following outlines a few starting points or policy directions that Europe should follow in its international innovation policies and which must guide its diplomatic actions. These points are not new, on the contrary, some are strongly present in European external policies for quite some time, but in a rather disconnected way.

- 1) To start with, Europe should continue to foster, maintain and spread the message of open science, open innovation and remain open to the world. It clearly outlines the intentions and directions of Europe when it enters the international or global arena: Europe is seeking open collaboration to the benefit of all participants, taking international solidarity and the perspective of innovation as a global public good as its starting point. This starting point needs to be complemented with at least three other policy initiatives.
- 2) Europe should increase efforts to create a global level playing field, including free trade, free exchange of knowledge and of innovative products and services. Part of this is to take care of reciprocity in exchanging information, technology and innovations. There might be good reasons to transfer technology under favourable conditions to developing and/or partner countries, but the potential consequences in the home market may justify regulation of such transfers and the setting of limits to the freedom of companies to freely move their (technology) assets to other countries. In the same vein, the development and implementation of Europe's "Open Science Cloud" (facilitating the exchange of data and research tools) must include a number of measures, which regulate collaboration with global partners (Science/Business Network, 2018).
- 3) In the third place, it is necessary to identify and increase awareness of Europe's technological and related business strengths and in how far such strengths are critical for the functioning of Europe's economy and society. Europe represents a large and wealthy market, has a strong and innovative industry, which delivers high quality products and services, and it has several strong innovation eco-systems. Fostering such strengths and critical technologies⁸ is necessary to maintain a strong negotiating position in a world in which a major player like the US is moving toward a transactional approach to international relations. The actual policies may be both defensive as well as offensive. The intention of this third policy approach is to add a position of power to Europe's international relations and negotiations in the field of innovation.
- 4) The fourth and final group of complementary policies should focus on identifying and spreading the key social values and goals (e.g. in relation to quality of life, quality of labour, culture including privacy, and sustainability) that Europe wants to pursue in its internal and external innovation policies. Such values and goals can partly be spread to other countries via collaborative activities such as in the case of the transfer of European thinking about innovation eco-systems and the related smart specialisation strategies (Sanchez, Arrizabalaga, & Mendibil, 2018). International collaboration might also be the preferred mechanism to regulate the social impacts of the platform economy business and other oligopolistic sectors, but one-sided action could be just as effective, as the recent example of GDPR (General Data Protection Regulation) shows. In the case of GDPR Europe's example sets a standard, which finds many global followers. There are also cases where some form of force has been used, such as when Bangladesh was exempted from preferential trade arrangements with the US and Europe, to force the country to rapidly modernise the labour conditions in its textile industries. The societal goals which will drive future European research and innovation missions will, together with the UN Sustainable Development Goals, be very good starting points to invite other countries to join these missions and pursue similar societal goals.

It is important to bring these policy directions together in a coherent framework to present a clear future oriented vision of what Europe sees as its international role in innovation. With such a vision and the supporting policies, the role of Europe on the global platform gains in visibility and strength. The Union's external actions and the foreign and diplomatic services of the member states can become more effective when an improvement in the alignment in the field of external innovation policies between Member States, key business and other stakeholders and the Union is achieved. Such an action was already proposed by vice-president Kaitanen in 2016 (European Commission, 2016) considering the

⁸ Due to the dominance of the neo-liberal economic policy vision and the related generic innovation policies, thinking about existing and needed technological strengths is of recent date in Europe. An example can be found in (Reiss & et al, 2016).

broader field of economic diplomacy. But according to a Clingendael policy brief (Okano-Heijmans & Saverio Montessano, 2016) “*EU member state governments and private-sector organizations have barely discussed the issue – partly because they remain largely unaware of the increasing EU activism and/ or because they do not wish to encourage it.*” Over the past two years the interest has grown, not in the least because the Trump administration changed the international economic policy environment. Hopefully this “wake-up call” enables the development of a shared and coherent framework and of coordinated action in Europe. The complexities of applying these points both within and outside the European Union are fully acknowledged. It will be a challenge to align the Member States and an even greater challenge to apply the proposed points as policy directions in the international and global environment. But having such a set of policy directions will then provide the much-needed policy guidance to foreign affairs services and to innovation diplomacy.

Postscript: science diplomacy and innovation diplomacy

Throughout this brief it was argued that issues of innovation and competition have gained prominence over the collaboration orientation of science diplomacy. With innovation, science has also become an issue in the competitive relations between nations. This raises the question if there is still room for a view of science as a relatively neutral and authoritative function in society and if there is a special role for scientists in international relations. In other words: is it possible and useful to distinguish between science diplomacy and innovation diplomacy? In the case of innovation diplomacy, the diplomatic activities are clearly there to push science, technology and innovation forward, in the national interest or (as in the case of innovation as global public good) in the international or global interest. It is “diplomacy for science” (and innovation can be added here) in the terminology of the Royal Society and the AAAS (Royal Society and American Association for the Advancement of Science, 2010). But what can science do for diplomacy? In line with the “science for diplomacy” thinking, Berkman (Berkman, 2018) stresses the independent role of science and scientists: “*Science is a neutral platform that allows for less politically charged dialogues, which in turn create bridges that help overall diplomatic efforts.*” The classical example which supports this view is the Intergovernmental Panel on Climate Change (IPCC). Berkman also mentions international Arctic scientific collaboration and SESAME, the Middle East’s first major international research centre, designed to host both Israeli and Palestinian scientists. Although the conditions for such efforts, which usually take many years to show any political impact as the case of the IPCC illustrates (Montalvo & Leijten, 2015), are not getting better under the influence of growing competition, nationalism and populism, they remain valuable. In the perspective of responsible science and responsible scientists, the efforts to jointly develop scientific insights about shared problems and common views on international policy actions, should be welcomed. The world of science should, wherever possible, take collaborative action to build such insights and policy views on the many issues which transcend national boundaries. The UN sustainable development goals provide a good, but by far not the only starting point. The tensions that will arise between the two approaches (neutral and independent science diplomacy and competition-oriented innovation diplomacy) might very well be turned into socially productive insights and actions (see for example (Tatalovic, 2018)).

References

- Atkinson, R., Castro, D., & McQuinn, A. (2015). *How Tech Populism is undermining Innovation*. Washington DC: Information Technology & Innovation Foundation.
- Berkman, P. A. (2018, June 12). *Could science diplomacy be the key to stabilizing international relations?* Retrieved July 06, 2018, from The Conversation: <https://theconversation.com/>
- Cory, N. (2018 (January 22)). *The worst innovation mercantilist policies from 2017*. Washington DC: ITIF.
- DESTATIS, Statistisches Bundesamt. (2018). *Trade with goods and services: EU has worldwide largest export surplus*. Retrieved 12 06, 2018, from https://www.destatis.de/Europa/EN/Topic/ForeignTrade/EU_exportsurplus2016.html
- European Commission. (2016). *Open innovation, open science, open innovation - a vision for Europe*. Directorate-General for Research and Innovation. Brussels: European Union.
- European Commission. (2016, 02 26). *Vice-President Katainen's speech "Prosperity and Economic Diplomacy" at the EPSC seminar*. Retrieved 09 04, 2018, from https://ec.europa.eu/commission/commissioners/2014-2019/katainen/announcements/vice-president-katainens-speech-prosperity-and-economic-diplomacy-epsc-seminar_en
- Gehrt, D. (2018). *Innovation diplomacy caught between the two opposing logics of cooperation and competition: case study on EU-China S&T cooperation in the field of solar PV*. EL-CSID Working Paper, Brussels.
- IEEE. (2014). *The future we deserve. IEEE Spectrum, 50th anniversary issue 1964-2014*.
- Kinkel, S. (2015). Setting the scene: Global value chains, re-shoring activities, global innovation networks, and their impact on global innovation platforms. In 6CP, *Can Policy Follow the Dynamics of Global Innovation Platforms?* (pp. 15-40). Delft: 6CP.
- Kritikos, M. (2018, 09 27). *What if blockchain were to be truly decentralised?* Retrieved 10 16, 2018, from [http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_ATA\(2018\)624_248](http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_ATA(2018)624_248)
- Leijten, J. (2017). Exploring the future of Innovation Diplomacy. *European Journal of Futures Research*, 5(20). doi:<https://doi.org/10.1007/s40309-017-0122-8>
- Leijten, J. (2019). *Innovation and International Relations: Directions for EU diplomacy*. (submitted).
- Lund, S., & Tyson, L. (2018, May/June). Globalisation is not in retreat. *Foreign Affairs, Volume 97*.
- Montalvo, C., & Leijten, J. (2015, January/February). Is the response to the climate change and energy challenge a model for the societal challenges approach to innovation. *Intereconomics*, 50(1), 4-30.
- Okano-Heijmans, M., & Saverio Montessano, F. (2016, February). Who is Afraid of European Economic Diplomacy? *Clingendael Policy Brief*.
- Ortiz-Ospina, E., & Roser, M. (2018). *International Trade*. Retrieved June 15, 2018, from <https://ourworldindata.org/international-trade>
- Regulation of stem cell research in Europe*. (n.d.). (EuroStemCell) Retrieved 07 03, 2018, from <https://www.eurostemcell.org/regulation-stem-cell-research-europe>
- Reiss, T., & et al. (2016). *Study on EU Positioning: An Analysis of the International Positioning of the EU Using Revealed Comparative Advantages and the Control of Key Technologies*. Brussels: European Commission.
- Royal Society and American Association for the Advancement of Science. (2010). *New Frontiers of Science Diplomacy*. London: The Royal Society.
- Sanchez, B., Arrizabalaga, E., & Mendibil, J. (2018). *New Horizons shaping science, technology and innovation diplomacy: the case of Latin America and the Caribbean and the European Union*. Brussels: EL-CSID.
- Science/Business Network. (2018, November). *Priorities for the European Open Science Cloud*. Retrieved October 31, 2018, from <https://sciencebusiness.net/science-cloud/news/how-will-europes-science-cloud-fit-global-research-scene>
- Stiglitz, J. (1999). Knowledge as a global public good. In I. Kaul, I. Grunberg, & M. Stern, *Global public goods* (pp. 308-325). New York: UNDP.
- Tatalovic, M. (2018, 07 06). *Academies join forces in fight back against policymakers ignoring scientific evidence*. Retrieved 08 31, 2018, from ScienceBusiness.
- UN Department of Social and Economic Affairs. (n.d.). *Sustainable development knowledge platform*. Retrieved 07 27, 2018, from <https://sustainabledevelopment.un.org/>
- World Economic Forum. (2015). *Deep shift; Technology tipping points and societal impact*.

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