Tilburg University

Who benefits from ex ante societal impact evaluation in the European funding arena?

de Jong, Stefan P. L.; Muhonen, Reetta

Link to publication in Tilburg University Research Portal

Who benefits from ex-ante societal impact evaluation in the European funding arena?

A cross-country comparison of societal impact capacity in the social sciences and humanities

Stefan P.L. de Jong[1,2] & Reetta Muhonen[3]

1. Manchester Institute of Innovation Research, Alliance Manchester Business School, The University of Manchester, Denmark Building, Manchester M13 9NG, The United Kingdom
2. Centre for Science and Technology Studies, Faculty of Social Sciences, Leiden University, Kolffpad 1, 2333 BN Leiden, Netherlands
3. Research Center for Knowledge, Science, Technology and Innovation Studies, Faculty of Social Sciences, University of Tampere, FI-33014 University of Tampere, Finland.

Abstract

Increasingly, research funders include societal impact as a criterion in evaluation procedures. The European Commission is no exception to this trend. Societal impact determines one-third of a project's success in receiving funding from the Societal Challenges in H2020. Yet, there are large differences in terms of science and technology performance between countries that participate in the programme. In this article, we 1) compare societal impact practices in the social sciences and humanities in high-performing countries (HPC) and low-performing countries (LPC) to the evaluation of societal impact in funding procedures at the European level and 2) reflect upon consequences for the competition for research funding in the European funding arena. To this end, we introduce the concept of 'societal impact capacity' as well as a framework to analyse it. The analysis of 60 case studies from 16 countries across Europe shows that 1) researchers from HPCs have a higher impact capacity than those from LPCs and 2) researchers from HPCs report more details about impact than those from LPCs. This suggests that researchers from HPCs are better equipped to score well on the impact criterion when applying for funding than researchers from LPCs. We conclude with policy recommendations for the organisation and evaluation of societal impact.

Keywords: societal impact, productive interactions, evaluation, social sciences and humanities, European Framework Programme

Corresponding author: stefan.dejong@manchester.ac.uk / +44 (0) 161 275 5030

1. Introduction

Research funders increasingly expect societal impact of the projects they fund (Gulbrandsen, Mowery, & Feldman, 2011; Lyall & Fletcher, 2013; Mowery, Nelson, Sampat, & Ziedonis, 2001). The European Union (EU) is no exception to this trend. Its 8th and current Framework Programme for research, Horizon 2020 (H2020), is directly related to the European Commission's priority of '*Smart growth: developing an economy based on knowledge and innovation*' (European Commission, 2010, p. 3) as set out in its 'Europe 2020 Strategy.' The Commission highlights research as a key driver to realize this strategy and allocates 77 billion euros to H2020 (European Commission, 2013a; European Union, 2017).

Yet, there are considerable differences in the ability of European countries to contribute to this strategy. Using, among other sources, OECD and Eurostat data, the Commission regularly analyses the science and technology

1

performance of Member States and associated countries[1] that participate in H2020. Performance is measured across the full innovation process, from the main research and innovation investment policies, and research and innovation performance and reorganization, to the importance of technology intensive industries to the national trade balance, and results in a complex composite indicator (European Commission, 2013b, p. 3). The 2013 analysis served as an input for the 'Spreading Excellence and Widening Participation Part' of H2020. The Commission labelled countries that scored above 70% of the average performance as 'high-performing countries' (HPCs) or 'innovation leaders'. Countries that score below, a seemingly arbitrarily chosen, threshold of 70% are labelled 'low-performing countries' (LPCs) or 'widening countries (European Commission, 2017). For more details on the analysis of science and technology performance and the distinction between HPCs and LPCs, we refer to the cited documents. To address the systematic lower participation of the LPCs in the 7th Framework Programme, they receive additional support to participate in H2020 (European Commission, 2016a, 2017; Titarenko & Kovalenko, 2014). See table 1 for an overview of HPCs and LPCs.

Table 1: High- and low-performing Member States and associated countries

High-performing countries		Low-performing countries	
Member States	*Associated Countries*	*Member States*	*Associated Countries*
1. Austria	1. Iceland	1. Bulgaria	1. Albania
2. Belgium	2. Israel	2. Croatia	2. Armenia
3. Denmark	3. Norway	3. Cyprus	3. Bosnia and Herzegovina
4. Finland	4. Switzerland	4. Czech Republic	4. Faroe Island
5. France	5. Turkey	5. Estonia	5. Former Yugoslav Republic of Macedonia
6. Germany		6. Hungary	6. Georgia Moldova
7. Greece		7. Latvia	7. Montenegro
8. Ireland		8. Lithuania	8. Serbia
9. Italy		9. Luxembourg	9. Tunisia
10. Netherlands		10. Malta	10. Turkey
11. Spain		11. Poland	11. Ukraine
12. Sweden		12. Portugal	
13. United Kingdom		13. Romania	
		14. Slovakia	
		15. Slovenia	

Simultaneously, to ensure that research contributes to the Europe 2020 Strategy, the Commission uses impact on society as a criterion to evaluate applications in order to allocate funding in H2020 (European Commission, 2015). Governments and funders in many of HPCs have introduced similar criteria over the past decade, requiring researchers in these countries to comply or cope with such expectations (Dance, 2013; De Jong, Smit, & Van Drooge, 2016).

In this article, we 1) compare societal impact practices in the social sciences and humanities in high-performing countries (HPC) and low-performing countries (LPC) to the evaluation of societal impact in funding procedures at the European level and 2) reflect upon consequences for the competition for research funding in the European funding arena. To this end, we introduce the concept 'societal impact capacity' which we define as the ability of academic researchers to realize benefits to society based on academic research. Although it is defined as an attribute of academic researchers, we acknowledge that societal impact results from a collaborative process embedded in a context (Spaapen & van Drooge, 2011). Societal impact capacity is composed of the characteristics of academics, the stakeholders that are involved, the productive interactions between them, and the conditions provided by the context these interactions are embedded in. Productive interactions are *'encounters between researchers and stakeholders in which both academically sound and socially valuable knowledge is developed and used'* (De Jong, Barker, Cox, Sveinsdottir, & Van den Besselaar, 2014). Thus, our focus is on the processes and conditions that lead to societal impact rather than on the resulting societal impact itself.

---

[1] A non-EU country that has entered into a specific agreement ('association agreement') with the EU, to participate in a specific EU fund/funding programme (European Commission, n.d.).

We hypothesize that researchers from HPCs have a higher societal impact capacity than researchers from LPCs and are therefore better equipped to score well on the impact criterion when applying for H2020 funding. The hypothesis is explored by comparing policy documents on the evaluation of societal impact H2020 to societal impact capacity in 16 countries across Europe. To this end, we have collected 60 case studies from the social sciences and humanities (SSH) describing stakeholder involvement, productive interactions and the conditions these interactions are embedded in.

Previous research has predominantly considered societal impact on the national level (e.g. Gibson & Hazelkorn, 2017; Kitagawa & Lightowler, 2013). From these studies we learn that societal impact policies and evaluation procedures are ambiguous and create confusion and opposition among academics (Chubb, Watermeyer, & Wakeling, 2017; De Jong et al., 2016; Samuel & Derrick, 2015). Furthermore, it is known that societal impact evaluation procedures neglect relevant societal impact pathways (Olmos-Peñuela, Molas-Gallart, & Castro-Martínez, 2014). Nevertheless, academics have developed strategies to cope with societal impact in evaluation procedures (Chubb & Watermeyer, 2016). Yet, these studies on the national level do not reflect on the event in which multiple national practices meet in an international policy arena.

An exception to the national focus is the comparison of ex-ante societal impact evaluation by the National Science Foundation (NSF) in the United States and the European Commission in the seventh Framework Programme by Holbrook & Frodeman (2011). They conclude that the European Commission gives a larger role to policy makers in evaluating societal impacts, whereas the NSF leaves this task to the discretion of academic peers. However, this study did not compare evaluation procedures to societal impact practices. Other studies at the European level tend to address societal impact on the level of entire Framework Programmes in ex-ante (Delanghe & Muldur, 2007) and ex-post evaluations (e.g. Arnold, 2012; Arnold, Clark, & Muscio, 2005; Luukkonen, 1998) and therefore do not provide insights on societal impact evaluation on the project level.

Given the size of H2020's budget of 77 billion euros and its importance for the funding of research, it is rather remarkable that there are so few studies on the ex-ante evaluation of societal impact in research proposals on the European level. This paper aims to address this gap.

The remainder of this paper is structured as follows. In section 2 we concisely explain the arena in which academics with different societal impact capacities meet when competing for European research funding in H2020. We then introduce our analytical framework in section 3. Section 4 discusses the methodology, including data collection and analysis. Section 5 presents the results along three themes that emerged during the analysis. In section 6 we reflect upon our hypothesis. Last but not least, we formulate recommendations for practice as well as for future research.

2. Impact in the European Funding Arena

The current funding programme of the European Commission, H2020, has a total budget for science of 77 billion euro's. Of this budget, a third is earmarked for seven Societal Challenges. These challenges are 1) health, demographic change and wellbeing, 2) food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the bio economy; 3) secure, clean and efficient energy; 4) smart, green and integrated transport 5) climate action, environment, resource efficiency and raw materials 6) Europe in a changing world - inclusive, innovative and reflective societies and 7) secure societies - protecting freedom and security of Europe and its citizens (European Union, 2017).

Consortia applying to calls formulated within the Societal Challenges are required to include a section on 'impact' (societal impact) in their proposal, in addition to sections on 'excellence' (research quality) and 'implementation' (project management). Five evaluation criteria should be addressed in the impact section (see table 2). The first is 'expected impacts'. Expected impacts differ per call and are mentioned in the call text. Often, but not necessarily, clues are provided concerning the type of stakeholders to be involved and the ways to exchange knowledge with them. The other four criteria are not specified in call texts and thus require

applicants to develop and formulate their own ideas on the societal impact of their proposed project. Two of these criteria are more generic expectations concerning other societal impacts and knowledge production, whereas two are more specific expectations. One concerns impact on private business. This sub criterion suggests that the Commission considers impact on public stakeholders to be less relevant, which can be problematic for the SSH as many of their stakeholders can be found in the public sector (Benneworth & Jongbloed, 2010). The other concerns effectiveness of dissemination. The 'Guidance for evaluators of Horizon 2020 proposals' (European Commission, 2014b) sheds more light on how dissemination should be evaluated. The Commission stresses that dissemination should 1) be strategically planned throughout a project, as opposed to ad hoc; 2) have clear objectives, 3) be targeted at and adapted to audiences beyond the project's own community and 4) use the right medium and means (European Commission, 2014b). To put it differently, dissemination as a means to generate societal impact is expected to be an integral part of a project and it requires a deliberate strategy. This suggests that familiarity with societal impact processes is required in order to successfully respond to a call.

The impact section determines one-third of a proposal's chances in a highly competitive three-step evaluation procedure. The first step is an administrative check considering issues such as timely submission and complying to the page limit. The second step consists of peer review. The impact section and the sections on excellence and implementation receive a maximum of five points each and all three sections equally contribute to the final score. The peer review results in a ranking of proposals, yet proposals should receive at least ten points to be eligible for funding. In the third step, the Commission makes the final selection (European Commission, 2015). The first and only round completed so far is the 2014 and 2015 round. Approximately half of the submitted proposals in this round did not meet the threshold. Of the proposals that did meet the threshold, only 10.7% received funding. This makes funding addressing the Societal Challenges even more competitive than the highly competitive individual grants of the European Research Council (European Commission, 2016b; European Research Council, 2017).

Table 2: Evaluation criteria for impact in Societal Challenge applications (European Commission, 2014a)

	Evaluation criterion
1.	Expected impact (as listed in the work programme under the relevant topic)
2.	Enhancing innovation capacity and integration of new knowledge
3.	Strengthening the competitiveness and growth of companies by developing innovations meeting the needs of European and global markets; and, where relevant, by delivering such innovations to the markets
4.	Any other environmental and socially important impacts (not already covered above)
5.	Effectiveness of the proposed measures to exploit and disseminate the project results (including management of IPR), to communicate the project, and to manage research data where relevant

3. Analytical Framework

To systematically compare societal impact capacity, using HPCs and LPCs as a test case, we have designed an analytical framework that ties together the theoretical knowledge base on factors that influence societal impact. These factors relate to academics, stakeholders, productive interactions in which knowledge is exchanged and the context – the fourth factor, in which the other three types of factors are embedded. These factors are dicussed in more detail below. Together the four factors compose societal impact capacity. The individual elements have all received considerable attention in literature. We have drawn on these bodies of literature to design our analytical framework. A visual representation of the framework is presented in figure 1.

At the basis of this framework lays Spaapen & Van Drooge's (2011) definition of societal impact: '*a change in thinking and/or acting of stakeholders*'. Spaapen & Van Drooge (ibid) argue that societal impact is mediated and preceded by productive interactions. Studying productive interactions has been proven to result in a detailed understanding of practices leading to societal impact (Molas-Gallart & Tang, 2011). Productive

interactions are not established in isolation but are shaped by their context, which for example includes disciplinary and organizational factors (De Jong et al., 2011).
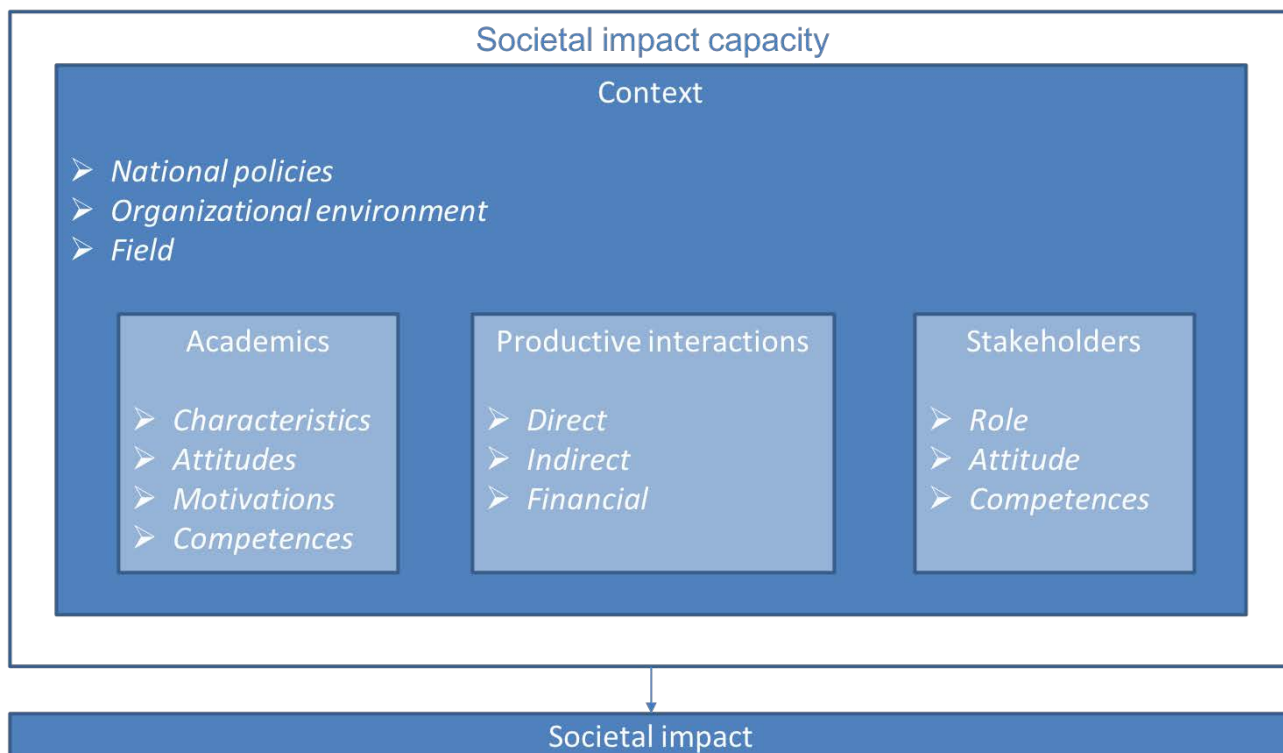

Figure 1: Analytical framework

3.1. Academics

Literature suggests a number of *characteristics of academics* that relate to their societal impact. According to Bastow, Dunleavy and Tinkler (2014, 59-64) there are two popular views on how the orientation of an academic influences his or her societal impact. According to the first view, academics with an applied orientation are developing the most societal impacts (Estabrooks et al., 2008; Landry, Amara, & Lamari, 2001; Landry, Saïhi, Amara, & Ouimet, 2010). The alternative view states that the societal impact of research derives from the scientific merit of an academic. This view is based on the assumption that advice is asked from top academics rather than from those less well-known. This seems to be in line with findings that suggest that experienced academics have more societal impact (Landry et al., 2010), although other authors find that younger academics have a stronger societal impact orientation (De Fuentes & Dutrénit, 2012; Jensen, Rouquier, Kreimer, & Croissant, 2008; van der Weijden, Verbree, & van den Besselaar, 2012). Bastow, Dunleavy and Tinkler (2014) conclude that in the case of the social sciences, both of these views are partially right and partially wrong. There is a relatively small group of top academics who are outperforming others both in terms of scientific and societal impact. However, a substantial group solely pursues scientific impact by concentrating on academic publishing. As a result, their external visibility is low. A third group scores moderately on both dimensions.

A rather influential attribute seems to be the *attitude* towards societal impact. Within the academic community, multiple attitudes can be found. Some academics feel an obligation to engage with society simply because their research generally is funded by tax payers' money or feel a responsibility to use their knowledge to solve societal problems (De Jong, Smit, & Van Drooge, 2016). Others feel that it distracts them from their core task of doing research or fear that engaging with stakeholders will diminish their, and thereby science's, autonomy (Chubb et al., 2017). Altogether, academics' ideas about their role in society result in different ways of interacting with society. Some might contribute to society's knowledge base by publishing their results in

academic journals, whereas others might actively advocate societal changes by engaging with stakeholders (Pielke, 2007).

Apart from the attitude towards societal impact, there is the *motivation* to commit to a specific societal impact endeavour. Such motivations might result from external pressures, resulting from societal impact policies, requests from stakeholders, expectations of academic disciplinary communities or a personal drive (De Jong et al., 2016; Olmos-Peñuela, Benneworth, & Castro-Martínez, 2015; Whitley, 2000). The latter have been linked to personal financial rewards, intellectual challenges and reputational rewards (Lam, 2011). The underlying motivation to have societal impact seems to determine the types of productive interactions with stakeholders that academics opt for. For example, those who aim to commercialize their research opt for less interactive ways than those who want to be intellectually challenged (D'Este & Perkmann, 2011).

Although attitude and motivation are important drivers, interacting with stakeholders requires additional *competences* that academics are not necessarily trained in (De Jong et al., 2016; Watermeyer, 2014)

3.2. Stakeholders

Many authors have identified the involvement of stakeholders in research as a factor conducing societal impact (e.g. Clark & Holmes, 2010; Meagher, Lyall, & Nutley, 2008; Raftery, Hanney, Green, & Buxton, 2009; Rogers, 1995; Walter, Helgenberger, Wiek, & Scholz, 2007). The *role* of stakeholders varies: in some projects, stakeholders have a formally acknowledged role in funding, conducting and/or implementing research, whereas in other projects their role remains informal, leaving no paper trail of their involvement, which does not exclude stakeholders from being an active research partner (Olmos-Peñuela, Molas-Gallart, et al., 2014). Literature suggests that the higher the involvement of stakeholders is, the larger the societal impact of the project will be (Peer & Stoeglehner, 2013; Pohl & Hirsch Hadorn, 2008; Voinov & Gaddis, 2008). Supporting findings include that research funded by stakeholders is more likely to be used by them (Gulbrandsen & Smeby, 2005; Landry et al., 2001, 2010). Also, stakeholder involvement is found to lead to more practical oriented research questions and access to data, facilities, research objects and research subjects (Brousselle, Contandriopoulos, & Lemire, 2009; Molas-Gallart & Tang, 2007; Phillipson, Lowe, Proctor, & Ruto, 2012; Rietchel, 2009). Furthermore, in dissemination, stakeholders facilitate the translation of academic knowledge to local user contexts (O'Fallon & Dearry, 2002; Weichselgartner & Kasperson, 2010).

However, in order for benefits for stakeholders and research to occur, stakeholders should have the *competences* to participate in research and to adopt knowledge (Landry et al., 2010; Perkmann et al., 2013). As many stakeholders generally have limited experience with SSH research, they should also have the goodwill, or *attitude,* to make additional investments in developing skills and acquiring a knowledge base to be involved in and adopt findings from SSH research (Rherrad, n.d.)

3.3. Productive interactions

We can discern three *types of productive interactions* between academics and stakeholders: direct, indirect and financial interactions (Spaapen & van Drooge, 2011). The first involve face-to-face encounters. Examples are bilateral meetings, workshops, e-mails and video conferences. The second involve mediated encounters, for instance books, articles, and exhibitions. The third involve economic transactions, such as contracts, in kind contributions or sponsoring of research. Financial interactions rarely are stand alone interactions. Rather, they support and regulate direct and indirect interactions.

The most effective types of interaction to result in societal impact, depend on the stakeholder(s) and the intended type of impact (De Jong, Wardenaar, & Horlings, 2016). In other words, ideally, productive interactions are selected according to their fit to goals (informing, consulting or including stakeholders) and fit to stakeholders (Rowe & Frewer, 2005). Yet, there are still many uncertainties about what types of interactions work best in specific situations (Mitton, Adair, McKenzie, Patten, & Waye Perry, 2007). Nevertheless, there seems to be a link between the efforts made by academics to interact with stakeholders and to select the most appropriate ways to do so on the one hand and the societal impact of their research on the other hand (Landry et al., 2001)

3.4. Context

The national, organizational and disciplinary contexts provide (dis)incentives for societal impact. National *policies* aiming for societal impact stimulate academics to collaborate with stakeholders (De Fuentes & Dutrénit, 2012; Hewitt-Dundas, 2012). Organisational *strategies* may affect the type of productive interactions academics opt for and determine the support academics may receive (Hewitt-Dundas, 2012). It is suggested that high-quality support fitted to the type of interaction results in more impact (Perkmann et al., 2013; Siegel, Waldman, Atwater, & Link, 2004). The organisation also affects impact through its more general orientation (Landry et al., 2001). Academics who conduct their research in a practice oriented environment, such as a university hospital, are more likely to involve with stakeholders and aim for impact (Estabrooks et al., 2008). Stakeholder orientation also seems to differ per *field*. Typically, the social sciences and humanities have a larger and more varied audience in broader society than for example physics and chemistry (Whitley, 2000). Furthermore, professional values might also be at play. Either negatively, as on the one hand academics may believe that interacting with non-academic audiences is looked down upon by their peers and therefore detrimental to their reputation (Jensen et al., 2008) or positively, as academics on the other hand may feel a responsibility to contribute to societal progress using their knowledge (De Jong et al., 2016) .

A major disincentive for societal impact experienced by academics, is the low reward in comparison to more traditional academic activities such as publishing (De Jong et al., 2016). Societal impact requires an investment of time (Estabrooks et al., 2008). If impact yields lower return on investment than other activities, such as publishing, academics are less likely to invest their resources in it.

4. Method

We take the SSH as a case to explore whether researchers from HPC have a higher societal impact capacity than researchers from LPCs and are therefore better equipped to meet the impact criterion when applying for H2020 funding. In many SSH fields there is no single obvious context of application, such as in the medical sciences, nor do most fields have an institutionalized relationship with commercial partners, as for example is the case in chemistry. Instead, many fields in the SSH have a large diversity of potential contexts of application and partners. On top of that, SSH fields are often characterized by engagement with local (national) issues rather than an internationally coordinated research agenda (Whitley, 2000). Its impacts are difficult to capture and compare using traditional impact indicators, such as patents, licensing income and spin-offs (Benneworth & Jongbloed, 2010; Olmos-Peñuela, Castro-Martínez, & D'Este, 2014). Given the above, it is no surprise that impact seems to pose the biggest challenge in the SSH. Therefore, in these fields we expect to find the largest tension between evaluation on the European level and national practices.

Also, impact of the SSH is still understudied (Hessels, Laurens, 2010; Olmos-Peñuela, Molas-Gallart, et al., 2014). Most of the previous studies on researchers' engagement with society has focused on measuring relationships, which are quantifiable. This has resulted in a lower recognition of the indirect, non-linear pathways to societal impact typical for SSH research (Frodeman, 2017).

Finally, H2020's Societal Challenge 6 '*Europe in a changing world - inclusive, innovative and reflective societies'*, which is generally known as the SSH challenge, is the most competitive of all societal challenges. It had a success rate of 5.1% among proposals submitted in 2014 and 2015 (European Commission, 2016b). These reasons makes the SSH both an interesting and a relevant case.

4.1. Data collection

A qualitative questionnaire in English was developed to guide the collection of case studies by members of COST Action 'European Network for Research Evaluation in the Social Sciences and the Humanities' (ENRESSH) during the second half of 2016 and the first quarter of 2017. Some of the members are societal impact and/or evaluation experts, others represent the wider spectrum of SSH fields. Apart from a general introduction of the case and the opportunity to mention other relevant elements of the case, to safeguard comparability between the cases, ENRESSH members were asked to collect data on the following topics: 1)

motivation of researchers to aim for the specific societal impact, 2) key people involved 3) the societal impact itself 3) productive interactions, 4) obstacles, 5) support and 6) evidence of use and relevance. Cases might be based on research funded by H2020 or one of its predecessors, but not necessarily. For a more detailed description of the data collection we refer to Muhonen et al. (forthcoming).

4.2. Data description

The distribution of the questionnaire resulted in a total of 65 submitted case studies from seventeen countries. Five cases were removed from the dataset. Two because the case study was not submitted in English (one from the Netherlands and one from Norway); two as they did not involve academic researchers (Portugal and Cyprus); and one as it did not describe any established productive interactions or societal impacts (Serbia).

The final set includes 60 cases that all describe productive interactions and impacts in which academic researchers from the SSH were involved. This unique dataset represents five LPCs (16 cases) and eleven HPCs (44 cases), resulting in a total of 16 represented countries. The higher number of cases from Spain and Belgium might be explained by the fact that ENRESSH members from these countries were involved in FP7 (SIAMPI) and H20202 projects (ACCOMPLISSH) that collected impact cases, making it relatively easy for these members to return multiple filled out questionnaires. Overall, our dataset covers 19% of the total number of LPCs and 61% of the total number of HPCs and 36% of all Member States and associated countries participating in H2020. An overview of represented countries is included in table 3.

5.   Table 3: Number of included cases per group of countries and per country

Group	Country	Number of cases
HPCs	Belgium	9
	Finland	2
	France	2
	Germany	1
	Iceland	2
	Italy	5
	Netherlands	4
	Norway	5
	Spain	7
	Switzerland	6
	United Kingdom	3
Sub total		44
LPCs	Croatia	7
	Estonia	1
	Portugal	5
	Serbia	1
	Slovakia	2
Sub total		16
Total		**60**

5.1. Analysis

The analysis was guided by a code book based on the analytical framework introduced in section 2 and on an exploratory analysis aiming to identify bottom-up emerging themes. For the exploratory analysis twenty randomly selected cases[2] were analysed using the 'free coding option' in Atlas.ti (v8.0) software for text analysis. The exploratory analysis revealed that societal impact can also be affected by the attitude towards impact of academic peers not directly involved in a project. A corresponding code was added to the codebook which was then entered into Atlast.ti. A first group of codes was used on the case level to characterise each case and to facilitate comparison between cases. Examples of such codes are 'social sciences', 'humanities' and the name of the country that the case originates from. A second group of codes was used at the quotation level: relevant selections of text, ranging from several words to several sentences. Examples of such codes are 'time', 'competences', 'academic researcher', private sector and 'indirect interaction'. Families of codes',

---

[2] Cases 5, 8, 9, 10, 13, 14, 18, 24, 25, 27, 31, 35, 37, 47, 51, 52, 56, 57, 63 and 64

grouping together two or more codes, were constructed to easily include all relevant cases for comparison. An example is 'LPCs', which included all the codes referring to a country that belongs to the group of LPCs.

All 60 cases were analysed using the 'select from list' option in Atlas.ti. After the coding was done, all quotations per code or family of codes were manually analysed in-depth to identify prominent themes per group of countries –HPCs versus LPCs. The results of the analysis are discussed in the following section.

6. Differences in societal impact capacity between high- and low-performing countries

Our analytical framework includes four components to compare impact practices in HPCs and LPCs: academics, productive interactions, stakeholders and context. However, the data demonstrates only minor differences between characteristics of academics in HPCs and LPCs. In our data, academics' motivations and attitudes related to impact mostly relate to the context. Thus, we are discussing characteristics of academics in relation to incentives provided by the context. Hence, in the remainder of this section we concentrate on the three main components where HPCs and LPCs differ: stakeholders, productive interactions and context. The combined picture shows significant differences between the groups in terms of their societal impact capacity. Finally, we discuss a difference in the reporting style between HPCs and LPCs. Although this was not part of our analytical framework, on the one hand it is a relevant bottom-up emerging observation and on the other hand it helps to interpret our results.

In some instances, quotes had to be edited to safeguard the anonymity of the involved academics. We have aimed to preserve the most detailed level of information possible. In other instances we have edited quotes for reasons of clarification, for example when abbreviations or short sections of local language were used. We have put edited text in between square brackets.

The dataset includes almost three times as many cases from HPCs than LPCs. We have taken this into account when interpreting the results by comparing relative presence of for example certain types of stakeholders rather than absolute numbers. Note that the overrepresentation of HPC cases can be interpreted as a first indication of a difference between the groups.

6.1. Type of stakeholders involved

Governments and politicians, ranging from local levels to national levels and the intergovernmental EU and United Nations, represent one of the two most prominent types of stakeholders that are reported in the impact cases. As they are present in 39 cases, this corresponds to almost two-third of the cases. Taking into account the under-representation of LPCs in our sample, governments and politicians are relatively slightly more mentioned in cases from LPCs (13 out of 16 cases) compared to those from HPCs (26 out of 44 cases).

The other most prominent type of societal actor are citizens. This type is also mentioned in 39 cases, although they seem to be more prominent in HPC cases (31 out of 44) than in LPC cases (8 out of 16).

The media are involved in half of all cases, which equals thirty cases. At the group level we see a similar pattern: about half of the LPC cases mention media (9 out of 16) as does nearly half of the HPC cases (21 out of 44). Despite governments, politicians, citizens and the media being prominent stakeholders, they are not specifically addressed in the societal impact evaluation criteria of the European Commission.

In total, twenty cases describe productive interactions with the private sector. This represents one third of the total number of cases. However, there is a difference between the two groups of countries. Only three cases from LPCs report interaction with the private sector, without providing any names of companies. The HPC sample contains seventeen cases in which the private sector is involved, which suggest an advantage of these countries to meet the criterion 'Strengthening the competitiveness and growth of companies' (see table 2). Again, many cases just refer to 'the private sector'. Yet, more specific examples are *'STIB (Brussels public transport company)'* (case 7, Belgium), *'Maison Chanel'* (case 21, France), *'notaries'* (case 31, Netherlands),

'a bank' (case 32, Netherlands), *'archaeology companies'* (case 49, Spain), *'oil companies'* (case 51, Spain), *'Coursera'* (case 58, Switzerland), *'academic publisher Brill'* (case 61, Netherlands) and *'Wired Sussex'* (case 63, UK). The number of cases that involve private stakeholders contradicts popular belief that the private sector has little interest in the SSH.

Other groups of involved stakeholders are from the cultural sector, such as museums and classical music festivals, the health care sector and the education sector. Strikingly, as all cases are from the SSH, hardly any of the LPC cases mention the involvement of the cultural sector. In HPC cases, the cultural sector is regularly reported. The involvement of the health care sector and education sector is more evenly distributed across both groups.

Finally, there is a variety of stakeholders that is involved in a single or just a few cases. In the case of LPCs these are mostly international organizations such as UNICEF, UNESCO and NGOs, but also libraries, local chambers of commerce and tourist information offices. The variety in HPCs appears to be larger. In these countries, NGOs are mentioned in many cases, international organizations are only sporadically involved. Other reported stakeholders are opinion leaders, the tourism sector, the church, administration of justice, the police, higher education, prisons, trade unions and interest groups, such as driver's associations.

6.2. Roles of stakeholders

Both in HPC and LPC cases, governments and politicians often are involved as commissioners of research, as research partners or merely as users. In some cases they provide researchers with data and tools, facilitate dissemination of knowledge, for example by publishing reports on their websites, or they are explicitly mentioned as being responsible for implementing results.

A few cases from LPCs report a lack of interest or even a hostile attitude of governments and politicians towards SSH research:

'[…] as SSH are considered 'weak' or even 'irrelevant' by official science policy, they are pushed to create societal impact and generate societal innovations in order to justify their existence', (Case 44, Serbia).

Such sentiments can be expected to introduce a barrier for academics to include these groups in the impact section of their H2020 proposal.

Conversely, a number of cases from the HPCs describe governments and politicians as taking the initiative in organizing events to exchange knowledge with SSH researchers and as appreciating SSH impact with awards:

'With this new event, the will of the Administration of the W-BF [Wallonia-Brussels Federation] *is to stimulate the links between the university research centers on the one hand and, on the other hand, the services and Observatories belonging (directly or indirectly) to the W-BF Ministry whose tasks are connected to scientific research in the SSH fields […].'* (case 9, Belgium).

And:

'The national research institutions recognised [name researcher]*'s work through several prizes (ex. Prix Anvie-CNRS for SSH-impact research, silver medal of CNRS in* [a year in 1990s].*'* (Case 2, France).

The distinction between the two groups is the ways in which knowledge is exchanged between governments and politicians on the one hand and academics on the other hand. Knowledge exchange in LPCs tends to be organized through reports, meetings and presentations. An exception is a webinar from a Portuguese case (case 39). In HPCs we see a larger diversity of ways to exchange knowledge. In addition to reports, meetings and presentations, bilateral meetings, training and consultancy roles are regularly mentioned:

'The research involved regular (about monthly) meetings, mostly between one of the practitioners and the PhD student,' (Case 55, Switzerland),

'[Professor in classics] *and* [director of innovation at Ministry of Economic affairs] *kept in touch and decided to jointly organise a masterclass',* (case 31, Netherlands),

and:

'Finally, [post-doctoral researcher in social sciences] *acts as a part-time consultant and independent expert in the framework of the 'Anti-radicalism network' of the Wallonia-Brussels Federation* [...]*',* (case 6, Belgium).

Synthesis notes, to enhance accessibility of insights, and discussion fora are also reported.

In both groups, citizens are primarily named as knowledge dissemination targets and knowledge users. In HPC cases citizens take part in events and are targeted through popularizing books, national public debate and sometimes training, which, apart from one exception (public debate in case 16, Croatia) are not being reported in LPC cases. In some cases they are involved in research, for example in providing input, as a research subject or as a more full-blown research partner. In the latter case, this mostly concerns specific groups of citizens, such as the deaf: *'The team is constituted of very complementary expertise, and co-creates research, products and services with the deaf community itself and the school teachers',* (case 8, Belgium) or Roma: *'In the field-work there were engaged app. 30 researchers (Roma-activists, employees of the Roma Plenipotentiary Office, university fellows, field social workers –app. Half of them of Roma ethnicity,'* (case 46, Slovakia).

In HPC and LPC cases alike, media is predominantly involved in taking up results and disseminating them, as exemplified by the following quote:

'The report was presented in public in December 2014 and gain[ed] *enormous interest by the media (press, electronic, internet-portals). All TV, radio and newspapers in Croatia informed about analyzed trends',* (case 11, Croatia).

A small number of cases mention the media as involved in data gathering, in workshops or in other events. What stands out is that in cases from HPCs interviews with academics or even documentaries about their project are much more abundant than in LPC cases. This is illustrated by cases from Iceland (case 23): *'Another important venue of interaction has been through the media with newspaper articles and interviews on radio and TV',* and Norway (case 35): *'The unlikely collaboration between researchers in music and medicine was featured in a mini-documentary on national TV (NRK Schrödingers katt) in 2008.'* This suggests that in HPCs academics and their research have a stronger presence in the media than in LPCs. A few academics in LPCs described the issue of negative media attention as a barrier to impact. Finally, social media play a role in just a few cases.

A bigger difference appears to be the way the private sector is involved. None of the LPC cases involve private partners as formal project partners. In HPC cases, private partners are not only involved as generic knowledge users, but also regularly more formally as funders of research: *'[…] interuniversity chair on companies and sustainable mobility (2016-2019) which came from the will of 12 private organizations to invest in a research chair through matched funding',* (case 1, Belgium), or making more substantive contributions to the project: '*Together with academic publisher Brill new modes of electronic publishing are explored and being developed',* (case 61, Netherlands). In a limited number of cases they are responsible for implementation or further development of results or they have an advisory role in the project.

Other types of stakeholders, such as the cultural sector, health care sector and education sector, are reported as commissioners of research (slightly more in HPC cases), as research partners or research subjects, as targets for dissemination and as knowledge users. However, in HPC, these groups are also targeted through trainings, courses and workshops are sometimes even invited to academic seminars or take up advisory roles in the project.

6.3. Conditions provided by context

The first condition that emerges from the cases is the attitude to impact of both academics and stakeholders. In the case of academics this concerns a negative attitude towards interacting with stakeholders. This issue is

most prominent in the HPC cases and concerns academics directly involved in the case as well as members from their peer community not directly involved. A considerable number of cases report negative attitudes towards interacting with stakeholders. The provided reasons include that it could give stakeholders too much influence, which would decrease academic independence (e.g. cases 4 and 5, Belgium) or that it could lead to oversimplification and instrumentalisation of SSH research (case 1, Belgium; case 56, Switzerland).

Concerning attitudes of stakeholders, besides their attitude towards interacting with academics, it is mostly about their attitudes towards the topic academics study in the specific case. Apart from one exception (case 12, Croatia), all LPC cases reporting on attitudes of stakeholders describe them as negative. This could concern the topic, such as Roma (case 17, Croatia) or drug decriminalization (case 41, Portugal), but also towards SSH researchers in general: *'There is a grooving* [possibly, 'growing' was meant here] *sentiment in our society too, that scholars are socially useless'* (case 44, Serbia). In HPC cases, attitudes of stakeholders are less negative and often seem to reflect a lack of interest or understanding concerning the topic rather than hostility. Such negative and indifferent attitudes can be expected to have a decreasing effect on the societal impact capacity in both groups of countries.

The indifferent or even negative attitude of stakeholders towards SSH research might relate to the second condition, the motivation of academics to have an impact on society. In both groups of countries a small number of cases clearly state that the motivation of academics to have societal impact relates to showing the societal value of SSH research. For example:

'The main motivation behind the intervention described was to demonstrate social usefulness of social sciences and humanities in general, and cultural anthropology in particular […]' (case 44, Serbia).

Other frequently listed motivations underpinning the impact relate to driving societal change, reacting to societal needs and the wish to apply academic knowledge. Yet, a reasonable number of projects were initiated purely on the basis of academic interests, aiming for impact only later on.

There are no large differences between HPC and LPC cases in the so far mentioned motivations. The biggest difference is that academics in cases from HPCs also strive for impact as policies or criteria of national funders require them to do so. Academics from LPCs do not display this specific motivation at all. This seems to confirm our assumption that academics in HPC countries have more experience in complying or coping with impact policies.

The third condition is the competences required to interact with stakeholders. These are mentioned in just 7 cases, remarkably all from HPCs. One case mentions that multimedia competences facilitated the dissemination of results. Other cases report that stakeholders lack competences to adopt and implement insights or mention the difficulty of combining scientific competences and dissemination competences: '*The largest obstacle was the lack of experience with similar collaborative projects.* […] [associate professor in anthropology] *stresses the need for the right support when academics enter a different world*' (case 32, Netherlands).

Indeed, impact support is the fourth condition. Despite some academics voicing a need for support, thirteen cases, relatively slightly more from LPCs, explicitly state not having received any support –of which one stressed support was not required anyway. Of the LPC cases, only one case explicitly mentions support in the form of incentives for young researchers to conduct policy oriented research (case 44, Serbia). The same case also reports that employers, such as universities and museums, increasingly accept researchers who combine basic and applied research. Among HPC cases, some cases include national and institutional policies aiming to stimulate societal impact as support. Others emphasise that the lack of appreciation for societal impact in the science system, for example in publishing results or in academic CV's (case 67 Finland), is not supporting societal impact related activities. This tension is clearly voiced in a case from the UK:

'Achieving and documenting societal impact has become a very important task for academics. However, these activities are not explicitly accounted in their workload models, and they may divert time and efforts that could be devoted to other equally important activities such as publishing academic articles.' (case 63).

Nevertheless, more direct support seems to be an exception. If provided, it is found in HPC cases and involves finances (case 30, Italy), societal impact awards (case 24, Iceland; case 59, Switzerland), communication support (case 31, Netherlands; case 22, Germany; case 57, Switzerland) and ICT support (case 58, Switzerland). In one case, external professional support was hired (case 31, Netherlands). However, not all cases that received direct societal impact support are positive about it:

'First, the Technology Transfer Office (TTO) of the university had no competence or experience in KT [knowledge transfer] *in the SSH, usually only working with STEM KT projects. Hence, it was very hard and time consuming for* [post-doc in terrorism studies] *to convince the officer of the relevance of the project.'* (case 6. Belgium).

Finally are time and money. Although money is mentioned in eleven cases as a limiting issue for societal impact and time in four, they do not appear to be crucial factors. A lack of these resources limits societal impact as it reduces the opportunities to interact with stakeholders or opportunities for further research: *'Budgetary constraints and time limit of the project limited the social impact, which could be deeper with the involvement of a higher number of patients and a longer duration'* (case 25, Italy).

5.4 Reporting style

There seems to be a difference in reporting between HPCs and LPCs: on average the former report more detailed on societal impact than the latter. Although, the differences are subtle, a typical example is the contrast between:

'Toolbox Gender at School (www.procrustes.be):

The toolbox contains about 50 tools and wants to initiate professionalization of teachers regarding gender, leaning on the research findings. To strengthen gender awareness of teachers, the tools focus on what is happening in class and school policy. Three training centra (Centrum Nascholing Onderwijs [Centre for In-service training Education] *(Universiteit Antwerpen), het Steunpunt Diversiteit en Leren* [Support Centre Diversity and Learning] *(Universiteit Gent) and het Centrum voor Ervaringsgericht Onderwijs* [Centre for Experiental Education] *(KU Leuven)) offer teachers a module based on Procrustes. A book has been published ("Gender op school: meer dan een jongens-meisjeskwestie")* [Gender at school: more than a boy-girl issue] *aimed for a broader audience, but in particular for teachers and educational policy makers.'* (Case 3, Belgium).

And:

'The report was distributed to all relevant ministries, media and to general public.' (case 15, Croatia)

The case from the HPC does not only mention the type of output, but also its title and it does not only mention the type of stakeholder involved, but also the number and the names of the stakeholders, whereas the case from the LPC only mentions generic categories.

This difference in reporting might have influenced our results. Building upon the example, it might have been the case that respondents in LPC mentioned the involved ministries and media by name, but that the reporter did not deem such a detailed level of information to be important and therefore opted for a more generic description. As a considerable number of ENRESSH members are experts in evaluation and/or impact and could therefore be expected to be aware of the importance of detail, this finding stands out even more. In contrast, respondents and reporters from many HPCs, whether impact and/or evaluation experts or general SSH scholars, are primed to mention such details as they are key in societal impact evaluations on the national level. Thus, the differences in reporting impact among non-experts might be even larger than our data suggests. Whatever the reason for the difference is, it suggests there might not only be a difference in societal impact

capacity, but also in demonstrating it. If this is the case, then academics from LPCs have an additional disadvantage when applying for funding from H2020.

7. Concluding remarks

In the introduction of this article we introduced the concept 'societal impact capacity', which we defined as the ability of academic researchers to realize benefits to society based on academic research. We hypothesized that researchers from HPCs have a higher societal impact capacity than researchers from LPCs and therefore are better equipped to score well on the impact criterion when applying for H2020 funding. To explore this hypothesis, we introduced an analytical framework to analyse differences in societal impact capacity, in this case between HPCs and LPCs. The framework proved to facilitate a systematic comparison of societal impact capacity. The results of our analysis suggest that the societal impact capacity in HPCs is indeed higher than in LPCs, which confirms our hypothesis.

To summarize the results of the comparison, first LPC cases show a smaller variety of involved types of stakeholders. This contributes to a lower societal impact capacity. Most importantly, it seems to be less common for them to involve citizens, the private sector and the cultural sector than in HPC cases. Especially the lower involvement of citizens and the cultural sector is surprising, as these are considered to be typical audiences of SSH research (Whitley, 2000). An explanation might be found in the differences in social capital among European countries. Most LPC countries can be found in Eastern Europe. In these societies, a lack of trust in formal organizations and lower involvement with civic society is common. Hence, there is less of a tradition of establishing links with organizations outside trusted informal circles than in for example the Nordic countries and the Netherlands (Pichler & Wallace, 2007). Still, we observed collaborations with government in LPCs. This might be explained by the convention that if government puts in a request, it should be answered.

Second, similarities between the two groups of countries concerning the involvement of stakeholders are that in both it is common for stakeholders to be involved as funders of research, as project partners or as knowledge users. However, cases from HPC report a larger variety of additional ways to involve stakeholders, which contributes to a higher societal impact capacity. Especially concerning dissemination, they seem to use a wider array of interaction channels that also seem to be more adapted to specific audiences, such as popularising books for the wider public or training courses and synthesis notes for governments and politicians. This suggests that academics from HPC countries are better equipped to meet the sub criterion 'Effectiveness of the proposed measures to exploit and disseminate the project results' (see table 2) than academics from LPC countries.

Third, the most significant differences between the context in LPCs and HPCs are the negative attitude of stakeholders towards SSH research that academics in LPCs face and the influence of policies and funding requirements on the motivation of academics in HPCs to strive for impact. HPC and LPC cases are more similar concerning societal impact support. Although there seems to be a general lack of support, in HPC support structures for societal impact of SSH seems to be on the rise. Insufficient money and time pose constraints in both groups of countries, but don't appear to be major issues.

When regarding societal impact capacity in the light of the evaluation criteria for impact in H2020, it becomes clear that academics from LPCs are in a disadvantaged position when applying to calls formulated within H2020's Societal challenges. The guideline for evaluators stresses two concrete sub criteria for the evaluation of societal impact: 1) impact on private business and 2) effectiveness of dissemination. Our analysis shows that SSH researchers in LPCs hardly collaborate with companies and that they have a smaller repertoire of dissemination models to tap into. On top of that, the reporting style of LPCs provides an additional disadvantage. In evaluation procedures it is not only about *what* can be presented, but also about *how* it is presented. The LPC cases provide less detail than HPC cases, which does not support the presentation of a deliberate impact strategy in applications to calls.

Concerning the evaluation criteria for impact, it stands out that impact on the public sector, including government, is not mentioned. Although impact on this sector could be considered as 'any other socially important impacts', it signals that the EC may consider this category of impact to be less important than impact on the private sector. Academics who respond to calls and who observe this signal, might favour including impact on the private sector over impact on the public sector in their proposal to increase its chance of receiving funding. However, an alternative explanation could be that the EC perceives itself, and governments, primarily as a funder of research, overlooking its potential of a knowledge user of the research it funds. In any case, the public sector constitutes a major stakeholder category of the SSH (Benneworth & Jongbloed, 2010). Note that president Juncker (2014) of the EC identified at least two major priorities – 'migration' and 'democratic change', in response to populism, for his commission that request a major input from the SSH. This example shows that impact on the public sector is too important to neglect or not to address specifically.

Policy recommendations

Our conclusion allows us to draw several policy recommendations, aiming at different actors, to improve the societal impact capacity and thereby societal impact of researchers in the SSH:

First, for the European Commission, as it aims to promote impact of the research it funds on the one hand and focuses on widening participation on the other hand:

- to take into account the different national impact practices in Member States and associated countries in evaluations
  - from the perspective of the evaluand: national practices and national policies may shape an impact section.
  - from the perspective of the evaluator: national practices and national policies may shape the evaluators assessment of an impact section.
- to intensify the briefing of academics, especially those from LPCs, on the impact criterion, including expectations concerning reporting.
- to consider specific financial support to further develop societal impact capacity in LPCs.
- to include impact on the public sector, and governments in specific, in the formal impact evaluation criteria.

Second, for academics from LPCs to actively search for collaboration with private parties, consider additional interaction channels with stakeholders and familiarize themselves with societal impact reporting –should they aim to successfully participate in H2020's Societal Challenges or succeeding funding instruments.

Third, for academics from HPCs, who prepare joint applications with academics from LPCs, to support them in designing societal impact strategies and reporting on these strategies.

Finally, a more general recommendation is for governments and universities in both HPCs and LPCs. If they consider their demand for impact to be serious, they should invest in support structures for a broad range of impacts. Our data suggests that at least some academics, most notably in HPCs, feel they lack the competences to have an impact on society. Professional support could benefit these academics. However, dedicated societal impact support for SSH scholars is an exception in the cases in our dataset. In those instances where support was provided, it was not per se of the level of quality that successful and efficient impact requires. In other words, impact of SSH could benefit from professional support within universities in similar ways as impact of STEM research has received from Technology Transfer Offices in HPCs for three decades now (Geuna & Muscio, 2009; Siegel et al., 2004). The junior Minister of Science of the Netherlands has recently announced such an investment. However, the interactions to receive support are narrowly formulated as interaction with business and industry (Ministerie van OCW, 2017). As our analysis and other studies show (Benneworth & Jongbloed, 2010; Olmos-Peñuela, Castro-Martínez, et al., 2014), SSH research has a much broader range of beneficiaries than the private sector only, in particular governments and politicians.

Further research

Finally, the study also leads to suggestions for further research.

Our dataset only allowed us to indirectly explore whether societal impact capacity poses an additional hurdle for academics from LPCs as our analysis was based on case studies rather than impact sections included in submitted proposals. Therefore, we call for studies that analyse impact sections of submitted proposals, as well as the corresponding evaluation summary reports, in H2020 and relate this to success rates of countries.

Furthermore, we have concentrated on differences between HPCs and LPCs here, but we are aware that there are differences in terms of national policies within these two groups. There are a few flagship countries of societal impact policies (e.g. UK, Netherlands, Belgium and Spain) among HPCs, but also several countries which devote little attention to impact in science policy (e.g. Iceland). This calls for a more fine-grained analysis of differences between countries based on the prominence of societal impact in national science policies.

European science policy makers deem both impact and 'Spreading Excellence and Widening Participation' to be important. Yet, as our analysis shows, the first may obstruct the latter and vice versa. Thus, we call for further studies on how different objectives of science policy interact with one another on a higher level (cf. Bos, Walhout, Peine & Van Lente 2014).

8. Acknowledgements

9. References

Arnold, E. (2012). Understanding long-term impacts of R&D funding: The EU framework programme. *Research Evaluation*, *21*(5), 332–343. https://doi.org/10.1093/reseval/rvs025

Arnold, E., Clark, J., & Muscio, A. (2005). What the evaluation record tells us about European Union Framework Programme performance. *Science and Public Policy*, *32*(5), 385–397. https://doi.org/10.3152/147154305781779335

Bastow, S., Dunleavy, P., & Tinkler, J. (2014). *The Impact of the Social Sciences* (1 edition). Los Angeles ; London ; New Delhi ; Singapore ; Washington, D.C: Sage Publications Ltd.

Benneworth, P., & Jongbloed, B. W. (2010). Who matters to universities? A stakeholder perspective on humanities, arts and social sciences valorisation. *Higher Education*, *59*(5), 567–588. https://doi.org/10.1007/s10734-009-9265-2

Brousselle, A., Contandriopoulos, D., & Lemire, M. (2009). Using Logic Analysis to Evaluate Knowledge

Transfer Initiatives. *Evaluation (London, England : 1995)*, *15*(2), 165–183. https://doi.org/10.1177/1356389008101967

Chubb, J., & Watermeyer, R. (2016). Artifice or integrity in the marketization of research impact? Investigating the moral economy of (pathways to) impact statements within research funding proposals in the UK and Australia. *Studies in Higher Education*, *0*(0), 1–13. https://doi.org/10.1080/03075079.2016.1144182

Chubb, J., Watermeyer, R., & Wakeling, P. (2017). Fear and loathing in the academy? The role of emotion in response to an impact agenda in the UK and Australia. *Higher Education Research & Development*, *36*(3), 555–568. https://doi.org/10.1080/07294360.2017.1288709

Clark, R., & Holmes, J. (2010). Improving input from research to environmental policy: challenges of structure and culture. *Science and Public Policy*, *37*(10), 751–764. https://doi.org/10.3152/030234210X534887

Dance, A. (2013). Impact: Pack a punch. *Nature*, *502*(7471), 397–398. https://doi.org/10.1038/nj7471-397a

De Fuentes, C., & Dutrénit, G. (2012). Best channels of academia–industry interaction for long-term benefit. *Research Policy*, *41*(9), 1666–1682. https://doi.org/10.1016/j.respol.2012.03.026

De Jong, S., Barker, K., Cox, D., Sveinsdottir, T., & Van den Besselaar, P. (2014). Understanding societal impact through productive interactions: ICT research as a case. *Research Evaluation*, *23*(2), 89–102. https://doi.org/10.1093/reseval/rvu001

De Jong, S. P. L., van Arensbergen, P., Daemen, F., van der Meulen, B., & van den Besselaar, P. (2011). Evaluation of research in context: an approach and two cases. *Research Evaluation*, *20*(1), 61–72. https://doi.org/10.3152/095820211X12941371876346

De Jong, S. P. L., Wardenaar, T., & Horlings, E. (2016). Exploring the promises of transdisciplinary research: A quantitative study of two climate research programmes. *Research Policy*, *45*(7), 1397–1409. https://doi.org/10.1016/j.respol.2016.04.008

De Jong, Smit, J., & Van Drooge, L. (2016). Scientists' response to societal impact policies: A policy paradox. *Science and Public Policy*, *43*(1), 102–114. https://doi.org/10.1093/scipol/scv023

Delanghe, H., & Muldur, U. (2007). Ex-ante impact assessment of research programmes: The experience of the European Union's 7th Framework Programme. *Science and Public Policy*, *34*(3), 169–183. https://doi.org/10.3152/030234207X218125

D'Este, P., & Perkmann, M. (2011). Why do academics engage with industry? The entrepreneurial university and individual motivations. *The Journal of Technology Transfer*, *36*(3), 316–339. https://doi.org/10.1007/s10961-010-9153-z

Estabrooks, C. A., Norton, P., Birdsell, J. M., Newton, M. S., Adewale, A. J., & Thornley, R. (2008). Knowledge translation and research careers: Mode I and Mode II activity among health researchers. *Research Policy*, *37*(6), 1066–1078. https://doi.org/10.1016/j.respol.2008.04.006

European Commission. (2010). *Europe 2020: A strategy for smart, sustainable and inclusive growth*. Brussels: European Commission.

European Commission. (2013a). Factsheet: Horizon 2020 budget. European Commission.

European Commission. (2013b). *Innovation performance in EU Member States and Associated countries Innovation Union progress at country level*. Brussels: European Commission.

European Commission. (2014a). Horizon 2020 – Work Programme 2014-2015. General Annexes. H. Evaluation. European Commission.

European Commission. (2014b, September 26). Guidance for evaluators of Horizon 2020 proposals. Version 1.1 of 26 September 2014. European Commission.

European Commission. (2015, May 28). Grants Manual - Section on: Proposal submission and evaluation (sections III.5, III.6, IV.1, IV.2). European Commission.

European Commission. (2016a). Widening Actions in Horizon 2020. Bridging the Research & Innovation divide in Europe. European Commission. Retrieved from https://publications.europa.eu/en/publication-detail/-/publication/c43e1c38-e849-11e6-ad7c-01aa75ed71a1/language-en/format-PDF/source-30929911

European Commission. (2016b, November 21). Horizon 2020 Annual Monitoring Report 2015. European Commission.

European Commission. (2017). *Horizon 2020: Work Programme 2018-2020 15. Spreading Excellence and Widening Participation*. Brussels: European Commission.

European Commission. (n.d.). Glossary. Retrieved January 15, 2018, from http://ec.europa.eu/research/participants/portal/desktop/en/support/reference_terms.html

European Research Council. (2017, February 22). Statistics. Retrieved January 12, 2018, from https://erc.europa.eu/projects-figures/statistics

European Union. (2017). *Key findings from the H2020 interim evaluation*. Brussels: European Union.

Frodeman, R. (2017). The impact agenda and the search for a good life. *Palgrave Communications*, *3*, 17003. https://doi.org/10.1057/palcomms.2017.3

Geuna, A., & Muscio, A. (2009). The Governance of University Knowledge Transfer: A Critical Review of the Literature. *Minerva*, *47*(1), 93–114. https://doi.org/10.1007/s11024-009-9118-2

Gibson, A. G., & Hazelkorn, E. (2017). Arts and humanities research, redefining public benefit, and research prioritization in Ireland. *Research Evaluation*, *26*(3), 199–210. https://doi.org/10.1093/reseval/rvx012

Gulbrandsen, M., Mowery, D., & Feldman, M. (2011). Introduction to the special section: Heterogeneity and university-industry relations. *Research Policy*, *40*(1), 1–5. https://doi.org/10.1016/j.respol.2010.09.007

Gulbrandsen, M., & Smeby, J.-C. (2005). Industry funding and university professors' research performance. *Research Policy*, *34*(6), 932–950. https://doi.org/10.1016/j.respol.2005.05.004

Hessels, Laurens. (2010). *Science and the Struggle for Relevance* (PhD Thesis). Utrecht University, Utrecht.

Hewitt-Dundas, N. (2012). Research intensity and knowledge transfer activity in UK universities. *Research Policy*, *41*(2), 262–275. https://doi.org/10.1016/j.respol.2011.10.010

Holbrook, J. B., & Frodeman, R. (2011). Peer review and the ex ante assessment of societal impacts. *Research Evaluation*, *20*(3), 239–246. https://doi.org/10.3152/095820211X12941371876788

Jensen, P., Rouquier, J.-B., Kreimer, P., & Croissant, Y. (2008). Scientists who engage with society perform better academically. *Science and Public Policy*, *35*(7), 527–541. https://doi.org/10.3152/030234208X329130

Juncker, J. C. (2014). *A new start for Europe: My agenda for jobs, growth, fairness and democratic change*. Strasbourg: European Commission.

Kitagawa, F., & Lightowler, C. (2013). Knowledge exchange: A comparison of policies, strategies, and funding incentives in English and Scottish higher education. *Research Evaluation*, *22*(1), 1–14. https://doi.org/10.1093/reseval/rvs035

Lam, A. (2011). What motivates academic scientists to engage in research commercialization: 'Gold', 'ribbon' or 'puzzle'? *Research Policy*, *40*(10), 1354–1368. https://doi.org/10.1016/j.respol.2011.09.002

Landry, R., Amara, N., & Lamari, M. (2001). Utilization of social science research knowledge in Canada. *Research Policy*, *30*(2), 333–349. https://doi.org/10.1016/S0048-7333(00)00081-0

Landry, R., Saïhi, M., Amara, N., & Ouimet, M. (2010). Evidence on how academics manage their portfolio of knowledge transfer activities. *Research Policy*, *39*(10), 1387–1403. https://doi.org/10.1016/j.respol.2010.08.003

Luukkonen, T. (1998). The difficulties in assessing the impact of EU framework programmes. *Research Policy*, *27*(6), 599–610. https://doi.org/10.1016/S0048-7333(98)00058-4

Lyall, C., & Fletcher, I. (2013). Experiments in interdisciplinary capacity-building: The successes and challenges of large-scale interdisciplinary investments. *Science and Public Policy*, *40*(1), 1–7. https://doi.org/10.1093/scipol/scs113

Meagher, L., Lyall, C., & Nutley, S. (2008). Flows of knowledge, expertise and influence: a method for assessing policy and practice impacts from social science research. *Research Evaluation*, *17*(3), 163–173. https://doi.org/10.3152/095820208X331720

Ministerie van OCW. (2017, January 19). Kamerbrief over wetenschap met impact - Kamerstuk - Rijksoverheid.nl [kamerstuk]. Retrieved September 18, 2017, from https://www.rijksoverheid.nl/documenten/kamerstukken/2017/01/19/kamerbrief-over-wetenschap-met-impact

Mitton, C., Adair, C. E., McKenzie, E., Patten, S. B., & Waye Perry, B. (2007). Knowledge transfer and exchange: review and synthesis of the literature. *The Milbank Quarterly*, *85*(4), 729–768. https://doi.org/10.1111/j.1468-0009.2007.00506.x

Molas-Gallart, J., & Tang, P. (2007). *Policy and Practice Impacts of ESRC FundedResearch: Case study of the ESRC Centre for Business Research*. London: Economic and Social Research Council.

Molas-Gallart, J., & Tang, P. (2011). Tracing 'productive interactions' to identify social impacts: an example from the social sciences. *Research Evaluation*, *20*(3), 219–226. https://doi.org/10.3152/095820211X12941371876706

Mowery, D. C., Nelson, R. R., Sampat, B. N., & Ziedonis, A. A. (2001). The growth of patenting and licensing by U.S. universities: an assessment of the effects of the Bayh–Dole act of 1980. *Research Policy*, *30*(1), 99–119. https://doi.org/10.1016/S0048-7333(99)00100-6

O'Fallon, L. R., & Dearry, A. (2002). Community-based participatory research as a tool to advance environmental health sciences. *Environmental Health Perspectives*, *110*(Suppl 2), 155–159.

Olmos-Peñuela, J., Benneworth, P., & Castro-Martínez, E. (2015). What Stimulates Researchers to Make Their Research Usable? Towards an 'Openness' Approach. *Minerva*, *53*(4), 381–410. https://doi.org/10.1007/s11024-015-9283-4

Olmos-Peñuela, J., Castro-Martínez, E., & D'Este, P. (2014). Knowledge transfer activities in social sciences and humanities: Explaining the interactions of research groups with non-academic agents. *Research Policy*, *43*(4), 696–706. https://doi.org/10.1016/j.respol.2013.12.004

Olmos-Peñuela, J., Molas-Gallart, J., & Castro-Martínez, E. (2014). Informal collaborations between social sciences and humanities researchers and non-academic partners. *Science and Public Policy*, *41*(4), 493–506. https://doi.org/10.1093/scipol/sct075

Peer, V., & Stoeglehner, G. (2013). Universities as change agents for sustainability – framing the role of knowledge transfer and generation in regional development processes. *Journal of Cleaner Production*, *44*, 85–95. https://doi.org/10.1016/j.jclepro.2012.12.003

Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D'Este, P., … Sobrero, M. (2013). Academic engagement and commercialisation: A review of the literature on university–industry relations. *Research Policy*, *42*(2), 423–442. https://doi.org/10.1016/j.respol.2012.09.007

Phillipson, J., Lowe, P., Proctor, A., & Ruto, E. (2012). Stakeholder engagement and knowledge exchange in environmental research. *Journal of Environmental Management*, *95*(1), 56–65. https://doi.org/10.1016/j.jenvman.2011.10.005

Pichler, F., & Wallace, C. (2007). Patterns of Formal and Informal Social Capital in Europe. *European Sociological Review*, *23*(4), 423–435. https://doi.org/10.1093/esr/jcm013

Pielke, R. A. (2007). *The Honest Broker: Making Sense of Science in Policy and Politics*. Cambridge ; New York: Cambridge University Press.

Pohl, C., & Hirsch Hadorn, G. (2008). Methodological challenges of transdisciplinaryresearch. *Natures Sciences Sociétés*, *16*, 111–121.

Raftery, J., Hanney, S., Green, C., & Buxton, M. (2009). Assessing the impact of England's National Health Service R&D Health Technology Assessment program using the "payback" approach. *International Journal of Technology Assessment in Health Care*, *25*(1), 1–5. https://doi.org/10.1017/S0266462309090011

Rherrad, I. (n.d.). *Utilisation of Humanities and Social Sciences Knowledge in Research and Development: Evidence from French Firms*.

Rietchel, E. T. (2009). *Evaluation of the Sixth Framework Programmes for Researchand Technological Development 2002–2006*. Retrieved from http://ec.europa.eu/research/reports/2009/pdf/fp6 evaluation final report en.pdf

Rogers, E. M. (1995). *Diffusion of innovations*. New York: The Free Press.

Rowe, G., & Frewer, L. J. (2005). A Typology of Public Engagement Mechanisms. *Science, Technology, & Human Values*, *30*(2), 251–290. https://doi.org/10.1177/0162243904271724

Samuel, G. N., & Derrick, G. E. (2015). Societal impact evaluation: Exploring evaluator perceptions of the characterization of impact under the REF2014. *Research Evaluation*, *24*(3), 229–241. https://doi.org/10.1093/reseval/rvv007

Siegel, D. S., Waldman, D. A., Atwater, L. E., & Link, A. N. (2004). Toward a model of the effective transfer of scientific knowledge from academicians to practitioners: qualitative evidence from the commercialization of university technologies. *Journal of Engineering and Technology Management*, *21*(1), 115–142. https://doi.org/10.1016/j.jengtecman.2003.12.006

Spaapen, J., & van Drooge, L. (2011). Introducing 'productive interactions' in social impact assessment. *Research Evaluation*, *20*(3), 211–218. https://doi.org/10.3152/095820211X12941371876742

Titarenko, & Kovalenko. (2014). *Analysis of participation of new EU Member States ("EU-13") in FP7 in the area of Socio-economic Sciences and Humanities (SSH) A Task 3.3 Report*. NET4SOCIETY.

van der Weijden, I., Verbree, M., & van den Besselaar, P. (2012). From bench to bedside: The societal orientation of research leaders: The case of biomedical and health research in the Netherlands. *Science and Public Policy*, *39*(3), 285–303. https://doi.org/10.1093/scipol/scr003

Voinov, A., & Gaddis, E. J. B. (2008). Lessons for successful participatory watershed modeling: A perspective from modeling practitioners. *Ecological Modelling*, *216*(2), 197–207. https://doi.org/10.1016/j.ecolmodel.2008.03.010

Walter, A. I., Helgenberger, S., Wiek, A., & Scholz, R. W. (2007). Measuring societal effects of

transdisciplinary research projects: design and application of an evaluation method. *Evaluation and Program Planning*, *30*(4), 325–338. https://doi.org/10.1016/j.evalprogplan.2007.08.002

Watermeyer, R. (2014). Issues in the articulation of 'impact': the responses of UK academics to 'impact' as a new measure of research assessment. *Studies in Higher Education*, *39*(2), 359–377. https://doi.org/10.1080/03075079.2012.709490

Weichselgartner, J., & Kasperson, R. (2010). Barriers in the science-policy-practice interface: Toward a knowledge-action-system in global environmental change research. *Global Environmental Change*, *20*(2), 266–277. https://doi.org/10.1016/j.gloenvcha.2009.11.006

Whitley, R. (2000). *The Intellectual and Social Organization of the Sciences* (Second edition). Oxford England ; New York: Oxford University Press.