Chapter 7
Competing in the knowledge society

Traditional Ainu dance
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7 Competing in the knowledge society

Chapter presentation

Over the past decades, the growing importance of higher education and research as drivers of economic growth has led to an increase in international competition between countries, institutions and researchers. This chapter deals with the ranking of universities, the assessment of research and its role in project funding, the various ways in which different interest groups have responded to these, and generally, how international competition takes shape. Of particular interest is the divide between those countries, organizations and researchers that can compete at a global level and those that either do not have the abilities and resources to do so, or whose mission is more oriented to the local level.

The chapter begins by discussing the relatively recent phenomenon of the international ranking of universities, its problems, effects and likely future development. Besides cross-national rankings, various national governments and continental bodies have also set up more multifaceted research assessments and other approaches to the evaluation of research in the social sciences. Rankings and other assessment exercises are associated with efforts to improve research performance and quality as well as to guide the allocation of resources. In part because of the latter function, they have both proponents and opponents among scientists and representatives of academic institutions. An assessment that does justice to all universities would probably take into account the social and educational conditions in which these organizations operate and the diversity of missions that universities have. Research councils can adopt various approaches to the allocation of funding in the social sciences. Examples of the evaluation mechanisms used in these allocations, their benefits and limitations are discussed. The final section of this chapter consists of four papers dealing with the agenda-setting strategies of national funding agencies. Funding is central to intellectual advancement both in terms of individual careers and for the furthering of social scientific knowledge. It is therefore no small matter how research funding is allocated.

Rankings, research assessment exercises, resource allocation mechanisms and the other elements of the research system in which evaluation plays a role are based on two methodological approaches. The first consists of various forms of peer review, the appraisal of proposals, outcomes and organizations by other experts. The second involves metrics-based evaluations to which exercises using international bibliometric databases are central. Both types of evaluation have important limitations, some of which are specific to the social sciences; this is highlighted in various contributions. Rather than using one of these approaches in isolation, the best strategy seems to be for qualified experts to use a combination of both types; that is, both the quantitative type of evaluation and the more qualitative, peer-review process.

7.1 Global rankings

Introduction

In recent years, international rankings of universities have become a prominent feature of competition between research systems and research organizations. The first of these rankings was originally commissioned by the Chinese Government as a way to benchmark its own research universities in order to pursue its aim of developing 'world-class universities'. The publication of the Shanghai Jiao Tong University Rankings (SJTUIHE), however, had a worldwide impact, and other rankings followed (Erkkilä and Kauppi, Sanz-Menéndez and de Moya-Anegón).

The methodologies adopted to arrive at these rankings are controversial, to say the least, as all the authors in this section highlight. In spite of the many conceptual, methodological and technical problems with the ranking of universities, they have become popular and thus deserve to be taken seriously. Examining the problems, as the authors in this section do, is therefore crucial for both refining the rankings, and ongoing attempts to attain excellence in diverse settings and with unequal resources.

The ranking of measurable research performance, and thus the number of publications and citations, forms a large, or in some cases the exclusive, element of these approaches to university ranking. This approach has several important advantages. The indicators it generates are quantifiable and verifiable, which gives them some claim to objectivity. Furthermore they draw indirectly on the professional opinion that members of the global scientific community have of the knowledge claims published by researchers in each organization. However, the focus on international peer-reviewed journal articles rather than on other scientific output such as monographs tends towards an underestimation of university performance in the social sciences in comparison with the natural and medical sciences (van Raan and Erkkilä and Kauppi). To some extent, this problem can be addressed by ranking universities by scientific field: all three rankings mentioned in the articles now have a separate ranking for social sciences, which differ by the indicators used. Significant weight is attached to the number of researchers having received a Nobel Prize in economics in the Shanghai Jiao Tong ranking, high importance is attached to opinion polls ('peer review') in the *Times Higher Education Supplement* ranking, and publication and citation data are the sole indicators used in the Scimago ranking (Sanz-Menéndez and de Moya-Anegón). None of these address the non-inclusion of non-journal outputs in the analysis.

Another point of criticism concerns the reduction of a university's many complex functions into a single, measurable indicator. Such a single indicator increases the rankings' attractiveness to students, policy-makers and the media, but does not do justice to the complex and diverse nature of universities. In this respect it is interesting to refer to Japan, which has a long tradition of ranking its universities across a wide variety of indicators (Kodama and Yonezawa, 2009). In Europe the CHE Excellence Ranking compares the master's and doctoral programmes of a selected group of European universities across various indicators for several subjects including political science, psychology and economics. Such multi-faceted approaches may be less controversial than the search for a simple one-dimensional indicator of quality.

The existing rankings can have several potentially adverse consequences for social sciences and humanities research. One is to put pressure on universities to resemble the model of research universities at the expense of other functions, such as teaching, which universities also do and in which some are more specialized than others. Further, the attraction of highly ranked universities for students and teachers, as well as policy-makers' concentration of resources on a few elite universities that can compete in these rankings, may lead to an erosion of the higher education and research landscape. Nor does everyone agree that an over-emphasis on publications in international peer-reviewed journals included in the major citation indices, at the expense of other journals, monographs, doctoral theses and multi-authored books, is good for social sciences and humanities research.

Especially in developing countries, but also in Europe, most universities cannot hope to compete on the measures involved in these international rankings. Saleem Badat argues that they should not try to. This does not mean that the evaluation of university performance is of little value, because evaluations and benchmarking can be a central part of a strategy to improve quality. It is important, however, to adopt conceptual, methodological and technical tools and approaches which are suitable for the social sciences and humanities and the varied and different functions of universities.

However, the international ranking of universities is a reality which is likely to remain and multiply, and students, academics, university administrators and policy-makers do react to it. Considering the importance attached to rankings, several new actors are considering entering this market with alternative indicators for particular sets of disciplines, for teaching and learning and for third-mission activities. This includes university groups and newspapers, but also actors such as the European Commission. The authors in this section emphasize the prominence of world rankings, but also suggest ways of improving on them. This is crucial because the global hierarchies and norms established through them bring about significant shifts in national policies and the higher education landscape generally.

The social sciences and the ranking of universities

Anthony F. J. van Raan

During the last few years, rankings of universities, though controversial, have become increasingly popular. The rankings published by Jiao Tong University in Shanghai and those published by the *Times Higher Education Supplement* have attracted the attention of policy-makers, the scientific world and the public media. In these rankings, the emphasis is largely or even wholly on research performance. Consequently, the number of publications and other bibliometric elements, such as citations, play an important or even decisive role.

The number of social science publications in international journals is much lower than those for the natural sciences and medicine. Thus, the natural sciences and the medical fields dominate university rankings, while the strength of universities' social sciences scarcely contributes to their ranking position. Smaller universities, particularly those with an emphasis on social sciences, will have a better position as a result of the *Times Higher Education Supplement* (THES) ranking's peer-review element than in the more bibliometrically oriented and size-dependent Shanghai ranking. A striking example is the difference in the London School of Economics' position: a top position in the THES ranking and a low position in the Shanghai ranking.

Generally, social science research has a strong international orientation, but national orientation may play a more important role than it does in the medical and natural science fields (Kyvik and Larsen, 1994; Moed, 2005). There are considerable differences in the research and communication cultures between the medical and natural science fields, on the one hand, and the social sciences on the other. An exception is psychology, in which communication practices are similar to those in the exact sciences. In the social sciences, there is often less consensus on what constitutes successful scientific approaches. This may be an important conceptual issue: in the social sciences, the meaning of citations may differ from that in the medical and natural science fields. Publication practices in the social sciences are less standardized than those in the medical and natural science fields. International peer-reviewed journals are less important than in the exact sciences; the written scholarly communication system's structure often does not show a clear core–periphery structure; and English is not always a dominant language. Journals may even be multilingual.

What are the consequences of the ranking of universities for the social sciences (and for the engineering fields and the humanities)? Van Raan (2005) provides a comprehensive discussion of the conceptual, methodological and technical problems with the ranking of universities. The main points are that in the social sciences, the number of citations is generally an order of magnitude lower than in the medical and natural science fields, which complicates the statistical problems. And most social sciences need a considerably longer citation window (for example, counting citations up to five or six years after publication) than the natural sciences and medical fields (mostly four years).

Monographs, doctoral theses and multi-authored books are undoubtedly important sources of written communication in many fields of the social sciences. They should not be omitted from any assessment of social science research performance (Moed, 2005). However, bibliometric analyses usually only take citations from publications in journals covered by the Web of Science (WoS) or Scopus's citation index into account. Nevertheless, non-WoS or non-Scopus publications can be cited quite widely in articles in WoS- or Scopus-covered journals. Moreover, it is possible to determine the citation impact of non-WoS or non-Scopus publications, specifically books and book chapters, with appropriate analytical algorithms. Furthermore, comparison with a European benchmark is an effective means of coping with a possible US bias in the WoS or Scopus.

Besides WoS and Scopus, Google Scholar is becoming increasingly important as a source of citation data. Field-specific databases, such as ECONLIT, Psychological Abstracts and Sociological Abstracts, can also be used for output analyses. However, these databases have several properties that make them less suitable for calculating bibliometric indicators:

- None of the major field-specific databases systematically include cited references.
- The criteria for selecting sources may be unclear.
- The databases may have strong national or geographical biases.
- A considerable percentage of the processed documents do not mention the authors' institutional affiliations.
- The database producers may not include addresses in the database even if they are mentioned.
- Important data elements – even journal titles and country names – may not be standardized.
- Many databases are only available through host computers that offer only limited counting and statistical facilities.
- The use of these databases may be expensive.

A new and important development is the creation of national or university research databases in which publications in all fields of sciences, including the social sciences, are covered on the basis of field-specific quality criteria, regardless of whether a publication is covered by WoS or Scopus, and regardless of the document type. An important example of this development is FRIDA, a comprehensive bibliographical database for all scientific publications by Norwegian research institutions (FRIDA, 2008).ب

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Alternatives to existing international rankings

Tero Erkkilä and Niilo Kauppi

Ranking lists have turned into customary policy instruments for global governance in higher education. Despite their limitations, they serve as a basis for a number of significant higher education reforms. The European Commission's plan to challenge existing league lists by creating an alternative, multidimensional tool for the evaluation of world universities is an attempt to introduce new assessment criteria into this high-stakes global competition.

In the field of higher education, single league tables provide their users (administrators, students, politicians, journalists) with objectified information in a rapidly growing international student market. Existing ranking systems represent key tools for higher education reform.[1] For administrators and politicians, the quantitative social scientific information provided by these lists has become an indispensable part of policy planning (see for instance Harvey, 2008). As tools of symbolic power, ranking lists reinforce preconceived ideas for some users, while for others, they present a certain state of affairs as being inevitable, shaping reality in the field of higher education.

Two major university rankings (see Table 7.1) are published by the Shanghai Jiao Tong University Institute of Higher Education (SJTUIHE) and in a British magazine, *Times Higher Education* (*THE*) (formerly a newspaper, the *Times Higher Education Supplement*, *THES*). Jiao Tong has been producing an institutional ranking on a yearly basis since 2003. In February 2007 it published a ranking that covered five disciplinary fields. This ranking focuses on 'measurable research performance' (Liu and Cheng, 2005, p. 133). It is particularly favourable to universities in English-speaking countries: they represented 71 per cent of the world's top 100 universities in 2006. US-based institutions alone occupy seventeen of the world's twenty top-ranking universities.

The first *THES* ranking entitled *World University Rankings* was published in 2004. One of the driving forces behind

1. In the USA, evaluations of graduate programmes started already in the 1920s and a ranking of US colleges was published from 1983. The university rankings made their way to the UK in the 1990s. The rankings became internationally policy relevant in the 2000s, due to the marketization of higher education and increased mobility of students (Harvey, 2008: 187–88).

Table 7.1 > The assessment criteria used in the Shanghai Jiao Tong University Ranking and the *Times Higher Education Supplement Ranking*, 2007

Shanghai Jiao Tong University ranking (2007)[1]		
Criteria	**Indicator**	**Weight**
Quality of education	Number of alumni having won Nobel Prizes and Fields Medals	10%
Quality of faculty	Number of staff having won Nobel Prizes and Fields Medals	20%
	Highly cited researchers[2]	20%
Research output	Articles published in *Nature* and *Science*	20%
	Articles in Science Citation Index-Expanded and Social Science Citation Index	20%
Academic performance	Academic performance with respect to the size of an institution[3]	10%

Times Higher Education Supplement ranking (2007)[4]		
Criteria	**Indicator**	**Weight**
Research quality	Academic opinion: peer review[5]	40%
	Publications and citations per research staff	20%
Graduate employability	Recruiter review: employers' opinion[6]	10%
International outlook	Percentage of international staff	5%
	Percentage of international students	5%
Teaching quality	Faculty staff: student ratio	20%

Notes: 1. Academic Ranking of World Universities, Graduate School of Education, Shanghai Jiao Tong University (http://www.arwu.org). 2. Assessed in twenty-one subject categories. 3. Academic performance is composed of the sum of the weighted scores of the other five indicators (quality of education, quality of faculty and research output) divided by the number of full-time equivalent academic staff (see Saisana and D'Hombres, 2008: 20). 4. *Times Higher Education* (http://www.timeshighereducation.co.uk). 5. Sample of 5,101 respondents (2007). 6. Sample of 1,471 respondents (2007).
Source: Saisana and D'Hombres (2008, pp. 19–21).

the establishment of the league table was a perceived rising demand, in the UK and globally, for advice on higher education (Jobbins, 2005, p. 137). In contrast with the Shanghai ranking, the *THE* composite index partly rests on present reputation, thereby reproducing established global reputational hierarchies (Marginson, 2009b). Both the Shanghai and *THE* lists create a similar global order, in which US universities tend to do well. In the *THE* ranking, UK and Australian universities fare better than in the Shanghai ranking. Continental European universities are badly positioned in both university league tables.

These ranking lists, reproduced by a variety of think-tanks, present similar recipes for success in higher education: 'autonomization' of universities, concentration of resources through the creation of poles of excellence, and greater funding for certain types of research through R&D investment. This recipe has been extensively integrated into reforms of higher education. The single league table presents a clear, 'objective' order, a goal to emulate, and the means to attain this goal – all in the same package.

Problems and limitations of existing rankings

THE and Shanghai rank the top-rated universities consistently, but their overall correlation is only moderate ($r \leq 0.58$) (Saisana and D'Hombres, 2008, p. 11). Several scholars have criticized their dependence on bibliometric methods (for example van Raan, 2005). Rankings do not assess the research that is done in research institutes; they fail to appreciate, for instance, top research in such centres in Germany and France. Furthermore, they do not take into account the resources and institutional designs that are available for successful organizations. Rather, they impose the norms of leading research universities on the rest (Kivinen and Hedman, 2008). Counting the Nobel Prizes awarded to an institution (as in the Shanghai index) is also problematic since Nobel Prize laureates continue to influence their university's results even after their retirement. A large share of the *THE* ranking rests on an opinion-based peer review, lacking thorough assessment.[2] Although a major user group of the *THE* ranking system is students seeking a place to study, it offers very little information on the quality of teaching.

The ranking lists present a number of additional problems. One central shortcoming is their institutional approach: they measure universities without taking into account the variations between disciplines, let alone assessing the research by discipline. Furthermore, the information is presented as a fact and not as the result of a choice in terms of what to measure and how (Marginson, 2007, p. 139). Last but not least, the academic community have been passive in observing their profession's assessment, leading to calls for greater involvement on their behalf (Usher and Savino, 2007).

Despite these shortcomings, university rankings have become part of the global higher education landscape. The figures have contributed to the creation of a new 'status economy', which sets policies in higher education and innovation (Marginson, 2009a). Global hierarchies and norms are now reproduced, fought over and legitimized by a variety of research institutions specializing in the production of information on these hierarchies, and funded by nation-states or media corporations. Due to their global coverage and high visibility, these lists are causing significant shifts in national policies following a similar policy script. Sharing key causal beliefs and normative views, these symbolic power tools portray the world in a uniform manner. In so doing, their political nature is hidden. The figures produced and the perceptions of competition that they communicate tend to lock policy actors in an iron cage, leaving little room for policy alternatives (Erkkilä and Piironen, 2009).

The European Commission and the higher education rankings

In 2008, the European Commission declared that it would create an alternative European ranking list of world universities that would 'do justice'[3] to European universities. As a political actor with considerable organizational resources when compared with universities or specialized publications, the Commission entered the field of global higher education by attempting to transform its structure and criteria. This move can be understood in a context of escalating global competition in higher education, a competition over prestige that has a considerable impact on future economic development.

The Commission's strategy reveals the dualistic nature of struggles over classification. An internal competition occurs between figures and what they are supposed to reflect. Since European universities rank relatively poorly in all existing rankings, proposing minor changes to existing ranking lists was not an option for the European Commission. A second, far more radical solution was to introduce a new global assessment of higher education.

2. The notion of peer review is therefore downright misleading. Instead of a thorough investigation into the quality of research and teaching of a single institution, an opinion suffices to evaluate quality.

3. According to the Director General of Education in the European Commission, Odile Quintin (quoted in Dubouloz, 2008, p. 1).

This strategy will be successful only if the European Commission can succeed in delegitimizing existing ranking lists by producing credible alternative information.

The European Commission plans to create a new type of knowledge construct, a 'mapping' of certain key qualities in higher education that would include teaching and research, as well as elite and mass-commercial institutions (European Commission, 2008). Following the conclusions of the Berlin Principles on Ranking of Higher Education Institutions (produced by a group of mainly US and European experts in 2004), the aim was to produce a new 'fairer' ranking system to replace the existing league tables.[4] The winning bid for the European Commission's open call for tender for the creation of a multidimensional global university ranking came from the CHERPA-Network consortium, a consortium which is headed by the Centre for Higher Education Policy Studies of Twente University (Netherlands) and the German Zentrum für Hochschulentwicklung (Centre for Higher Education Development).[5] The basic framework should be operational in the course of 2010. During the pilot phase it will cover two disciplines (business studies and engineering) with a sample of some 150 (both European and non-European) universities, before being expanded to the social sciences as well.

In 2009, at least three overlapping Commission initiatives could be identified in the domain of higher education rankings, indicating the issue's growing politicization.[6] The Commission also participates in the OECD's AHELO initiative, whose purpose is to assess higher education learning outcomes.[7] What is remarkable about these different initiatives is a constant opposition to an accumulated figure, a single ranking number, such as the existing university rankings produce.[8] Ironically, however, in order for the criticism to gain in credibility, the Commission and other actors had to engage in the same venture of creating numerical information on university education and research. In so doing, they stepped into a trap typical of most struggles with classification, that of reducing a highly complex and contentious policy field (higher education) into a data set, albeit a more sophisticated one.

Conclusions

Public policy instruments such as ranking lists have the power to create reality. The global higher education map is different today from its shape prior to the creation of the 2003 Shanghai ranking of world universities. This global map has become more structured and ranking lists have turned into customary policy instruments for global governance in higher education. Despite their limitations, they have served and continue to serve as a basis for a number of significant higher education reforms. The European Commission's plan to challenge existing league lists by creating an alternative, multidimensional tool for the evaluation of world universities is an attempt to introduce new assessment criteria into this high-stakes global competition. It remains to be seen how successful this new ranking instrument will be. What is certain is that the actors involved in higher education assessment are gripped by a specific logic of knowledge production: numbers can only be challenged by more numbers produced by social science specialists.

4. Berlin Principles on Ranking of Higher Education Institutions (http://www.che.de/downloads/Berlin_Principles_IREG_534.pdf).
5. CHE (http://www.che.de).
6. In June 2008, the European Commission appointed an Expert Group on Assessment of University Based Research. Later the same year, during the rotating French presidency of the European Union, a project on design and testing of the feasibility of a Multi-dimensional Global University Ranking was launched. Along with these initiatives, there is ongoing work for profiling and classifying institutions of higher education.
7. OECD, AHELO (http://www.oecd.org/edu/ahelo).
8. In particular, the OECD's AHELO is explicitly critical of the rankings in higher education.

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A new industry: university rankings in the social sciences

Luis Sanz-Menéndez and Felix de Moya-Anegón

Despite objections and limitations, rankings – once disseminated – become taken for granted, and transform the environments of institutions by influencing their reputations. While rankings are no substitute for peer review or other types of assessments, they have become signals of quality in a global environment, and universities themselves are interested in being well ranked.

This paper discusses the impact of global rankings and compares two of these rankings – *Time Higher Education*'s (*THE*) *QS World University Rankings 2008* and the Scimago Institutional Ranking (SIR) in social science.

While rankings are popular with governments and the media, they are regarded as poor performance measures by most university administrators. Despite objections and limitations, rankings – once disseminated – become taken for granted, and transform the environments of institutions by influencing their reputations. While rankings are no substitute for peer review or other types of assessments, they have become signals of quality in a global environment, and universities themselves are interested in being well ranked.

Before the proliferation of rankings, institutions of tertiary education followed different procedures to position themselves in national and international markets and status systems. Institutional reputation depended on the opinions of professionals and recognized academics; status systems were based on a non-systematic aggregation of reputation and credit.

Status is a positional good that is necessarily comparative, relative and reciprocal. Comparisons build a status system that has symbolic value for organizations. In higher education and research, quality comparisons are a central measurement criterion, as information about reputation, productivity and performance is difficult to observe, measure and interpret in these contexts (Sauder and Espeland, 2009).

Rankings make status explicit and have several effects. First, they create a formal hierarchy. Second, by making status judgements public, rankings have caused institutions to become sensitive about their positions. Third, by imposing a shared metric, rankings help create or unify the organizational field (either in higher education or research) and produce isomorphic pressures. Finally, rankings also have the effect of creating 'good' and 'bad' reputation labels. This limits universities' and institutions' ability to build a reputation based on values or criteria other than those used to construct rankings. This is because assessment by third parties is more credible than self-assessment. There is evidence (Sauder and Lancaster, 2006) that the introduction of institutional rankings alters the structure of a status system and even the system's values and measures.

All measurement systems have problems and advantages. We next compare two different approaches to university rankings in the social sciences.

THE presents a 'multi-faceted' view of the relative strengths of the world's leading universities on its ranking list. It compares universities relatively by using a formula that combines six primary measurements of university quality:

- academic peer review (40 per cent)
- employer review (10 per cent)
- faculty/student ratio (20 per cent)
- citations per faculty (20 per cent)
- international faculty (5 per cent)
- international students (5 per cent).

THE has been criticized for its failure to take into account many of the attributes that constitute a university's quality and for the quality of its data collection. Additionally, the ranking's instability results from the effects of weightings and normalization, and especially from the peer-review survey.

THE includes 300 universities active in social sciences worldwide. The single classification criterion seems to be

'academic peer review'; the 'popularity' results are derived from a survey of 6,000 'experts'. Experts declare subject categories and specific subject competences for the survey.

The Scimago research group has produced an Institutional Ranking (SIR) using Scopus[1] publication data from 2003 to 2007. These data can be ordered by total output as well as by citations and citations per paper, and can be applied to the world as well as to regions and countries. A total of 2,000 institutions have been ranked, of which more than 1,800 are active in the social and economic sciences.

Owing to the journal coverage in the databases, general methodological problems arise such as biases towards countries, institutions and disciplines. There are a US bias in citation data, lower representation of languages other than English (van Raan, 2005), and limits to the use of bibliometric indicators in the social sciences (for example, Archambault and Larivière, in this Report; Clemens et al., 1995; Hicks, 1999; Nederhof, 2006).

While bibliometric methods lead to some problems and their use for research quality evaluation has been criticized (especially if they are decoupled from traditional peer review), they have, in comparison with a survey-based approach, the advantage of managing very large numbers and events (of publications and citations) to allow the visibility of small institutions.

Bibliometric rankings involve problems of production and usage. Responsible production entails solving technical problems such as matching citations with publications, normalizing institutions or affiliation-related problems. But 'popularity' rankings, especially in disciplines that still

Table 7.2 > *THE-QS World University Ranking 2008* (social sciences) SIR – Scimago Institutions Ranking 2003–2007 (social sciences)

THE rank	Institution	SIRR rank	Institution
1	Harvard University	1	Harvard University
2	University of California, Berkeley	2	University of California, Berkeley
3	Stanford University	3	University of Pennsylvania
4	London School of Economics and Political Sciences (LSE)	4	University of California, Los Angeles (UCLA)
5	University of Cambridge	5	University of London (includes LSE)
6	University of Oxford	6	University of Illinois, Urbana-Champaign
7	Yale University	7	University of Michigan, Ann Arbor
8	University of Chicago	8	New York University
9	Princeton University	9	University of Washington
10	Massachusetts Institute of Technology (MIT)	10	University of British Columbia
11	Columbia University	11	University of North Carolina, Chapel Hill
12	University of British Columbia	12	University of Toronto
13	University of California, Los Angeles (UCLA)	13	University of Maryland, College Park
14	McGill University	14	University of Wisconsin, Madison
15	Australian National University	15	University of Minnesota
16	University of Toronto	16	University of Oxford
17	Cornell University	17	University of Chicago
18	National University of Singapore (NUS)	18	Cornell University
19	University of Melbourne	19	University of Manchester
20	University of Michigan	20	Universiteit van Amsterdam

Source: QS Quacquarelli Symonds Copyright © 2004-2008 QS Quacquarelli Symonds Ltd. http://www.topuniversities.com.dev.quaqs.com/worlduniversityrankings/results/2008/subject_rankings/social_sciences

Source: Scimago Research Group, Copyright 2009. Data Source: Scopus® http://www.scimagoir.com

have a relevant local context, need clearer definitions of the respondents' universe, improved sampling procedures and specific data-collection exercises.

There is a significant difference between SIR's emphasis on scientific outputs and *THE*'s emphasis on 'popularity' within the academic community. Despite these diverse methodologies, however, some institutions appear among the top twenty in both rankings.

Both rankings show an overwhelming presence of Anglo-Saxon institutions. Communication in English as the lingua franca provides an advantage in terms of international visibility. But there are differences in the geographical breakdown of institutions: while *THE* has mostly US, Canadian and Australian institutions at the top, SIR has more North American and European ones.

Additionally, SIR offers quality indicators (such as citations per paper) to complement the output indicator. In this case, the universities of Michigan, Harvard and UCLA appear at the top, alongside Stanford and Columbia, which did not appear among the top twenty for total volume.

Combining the methods used by both rankings – for example, surveying the world's top researchers according to publications and citations – will probably improve the reputation of the measures' quality, even though they will continue to have serious limits as globally valid measures.

For the time being, a proper combination of scientific output and quality indicators – which SIR allows the user to do – can be a provisional solution to difficulties with representing institutions' research capacities. This provides the possibility of analysing better the positions of universities in different world regions in different status systems. Of course, caveats to the intelligent use of these rankings still apply (Weingart, 2005), especially regarding the social sciences, although the availability of data to compare performance has already changed status systems and the ways in which institutions see themselves.

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The world-class university and the global South

Saleem Badat

The global ranking of universities has come into prominence in the past few years. This paper analyses their value and what is at stake. It is argued that such rankings generate false perceptions and prejudice the global South, and that they should be replaced by alternative instruments that better serve educational and social purposes.

Global rankings

The Shanghai Jiao Tong University Institute of Higher Education (SJTUIHE) ranking has its genesis in the Chinese Government's quest to create 'world-class universities' as catalysts of development. The SJTUIHE ranking gives priority to six indicators for which data were available (Mohamedbhai, 2009).

The purpose of the *Times Higher Education*-Quacquarelli Symonds (*THE*-QS) ranking is 'to recognize universities as the multi-faceted organizations that they are, [and] to provide a global comparison of their success against the notional mission of remaining or becoming world-class' (*Times Higher Education*, 2007). It considers a mere six criteria to be pivotal for judging world-class (see Erkkilä and Kauppi in this Report).

Rankings: what value?

In order to establish their validity, university rankings need to be subjected to critical analysis in terms of their purposes, methodologies, and value to universities and society. I shall briefly address each in turn.

Regarding purposes, the SJTUIHE originated as an attempt to benchmark Chinese universities as a means of charting a trajectory for their development. However, SJTUIHE has become a global ranking of universities, despite being based on a narrow range of indicators which are wholly inadequate for measuring performance and quality in relation to diverse social and educational purposes, or a particular university's goals.

The *THE*'s precise purpose for generating a global league table of universities is opaque. Its discourse, however, is one of 'world esteem', with the world-class university representing the gold standard to which all universities should ostensibly aspire and according to which they should be measured. In the *THE* 'universe, higher education is primarily about reputation for its own sake, about the aristocratic prestige and power of the universities as an end in itself' (Marginson, 2007, pp. 138–39). The internationalization of the student body is valued less for enriching a university; instead, international students are a 'prized quarry' as 'universities are free to charge them whatever the market will bear' (*Times Higher Education*, 2007). Thus, 'it is not about teaching and only marginally about research'. Although it claims 'to recognise universities as multi-faceted organisations', the *THE*'s criteria are dubious as proxies for teaching and learning quality.

Methodologically, global rankings suffer from 'weaknesses in data collection and computation; the arbitrary criteria used in ranking; and the arbitrary weightings and standardization procedures used in combining different data sets into composite indexes' (Marginson, 2008a, p. 7). Such indexes 'undermine validity [as] it is dubious to combine different purposes and the corresponding data using arbitrary weightings. Links between purposes and data are lost' (Marginson, 2007, p. 139).

The indicators and their weighting privilege specific university activities, domains of knowledge production, research types, languages and university types. Thus, the natural and medical sciences are privileged over the arts, humanities and social sciences; articles published in English are favoured over those in other languages; journal articles are favoured over book chapters, policy reports and other studies. Furthermore, 'comprehensive' universities and generally larger institutions with a wide range of disciplines and larger numbers of academics – especially researchers – are privileged over others (Charon and Wauters, 2007). The rankings therefore enable the self-selection of universities

whose missions and academic offerings strongly match the rankings' performance measures.

What is at stake?

In terms of their methodologies, the SJTUIHE and *THE* rankings have little intrinsic value and serve no meaningful educational or social purpose. On the contrary, if they are not challenged, rankings and the assumed notion of the 'world-class university' as gold standard can have perverse and dangerous effects on universities in underdeveloped societies in the global South.

Modernization theory singled out Western capitalist societies as the apex of modernity and made 'catching up' with the West an ultimate development goal. With it came the view that underdeveloped societies' path to development lay in faithful adherence to the prescriptions of Western governments and Western-dominated multinational institutions, including the World Bank and the International Monetary Fund. Later on globalization and its supposed development benefits became the new goal.

If modernization theory depicts Western capitalist societies as the apex of modernity, global university rankings present the world-class university – essentially North American and European institutions – as the pinnacle and goal of all higher education development.

The value of uncritical mimicry of and 'catching up' with the so-called world-class university in order to further socio-economic development is questionable. It also cannot be assumed that creating world-class universities will in itself result in investment or development. Outstanding universities may be a necessary condition, but are not a sufficient condition of development. Many societies in the global South need to create favourable national environments for university work and for universities to contribute to society.

The SJTUIHE and *THE* rankings 'inculcate the idealized model of institution as a norm to be achieved and generalize the failure to achieve it' (Marginson, 2009b, pp. 13–14). The world- class university has until recently existed neither as a concept, nor as an empirical reality. Its status as the gold standard is the normative social construct of the rankers themselves.

The specific national conditions, realities and development challenges of societies in the global South, and the diversity of social and educational purposes and goals that universities in these societies must serve, require national higher education systems characterized by differentiated and diverse institutions. Institutional differentiation and diversity are to be valued over homogeneity and isomorphism. It makes little sense for all universities to aspire to a common 'gold standard' irrespective of socio-economic needs, missions, goals, capacities and capabilities. Graham has argued that universities should avoid aspiring to 'ideal[s] which they cannot attain' (Graham, 2005, p. 157). Otherwise, 'no sense of worth will be forthcoming' and they can have no 'proper self-confidence' (p. 157). There are many conceptions and models of the university, and these have changed over time. Furthermore, according to Graham, the 'name "university" now applies to institutions with widely different functions and characters' (2005, p. 157), and this means that the 'ideals each can aspire to' will be different (p. 258).

Instead of valuing a horizontal continuum that recognizes the need for universities to have different and diverse missions, and which makes provision for universities that pursue various missions, the idea of the world-class university as 'the idealized model of institution' has the perverse effect of privileging a vertical hierarchy. Universities that do not feature in the top 500 of the SJTUIHE ranking or the top 200 of the *THE*-QS ranking are devalued and are – by implication – poor-quality, second rate or failures. In the face of continuing global North–South inequalities, the burden of such characterizations weighs disproportionately on universities in the global South.

The rankings criteria favour publishing in English-language journals, and in effect privilege the English language. Especially in the arts, humanities and social sciences, prioritizing research and publishing in order to improve ranking can seriously undermine universities with important social, intellectual and cultural roles related to their local, regional and national societies.

Today, the competition for, and concentration on, economic advantage means that certain kinds of knowledge and research – especially those generated by the natural, medical and business sciences and engineering – are privileged. However, as Makwandire argues, 'attempts to improve Africa's prospects by focusing on scientific advances and the benefits accruing from them have all too often overlooked the important perspectives which the humanities and social sciences afford' (2009, ch. 7), and 'it is vital that the social sciences and humanities are granted their rightful place … if Africa's development challenges are to be fully and properly addressed'.

Rankings compromise the value and promise of universities as they 'divert attention from some central purposes of higher education' (Marginson, 2007, p. 139), and 'to accept these ranking systems is to acquiesce at these definitions of higher education and its purposes' (p. 139).

As important as new knowledge production and the scholarship of discovery are (Boyer, 1990), the foundation for the production of high-quality graduates who can advance development in the underdeveloped global South is high-quality learning and teaching. Moreover, community engagement and service learning are also vital functions of universities in the global South. Both are a 'means for connecting universities and communities with development needs' (Stanton, 2008, p. 3), and 'for higher education staff and students to partner with communities to address development aims and goals' (ibid., p. 2). However, the global rankings are only marginally concerned with learning and teaching, and overlook or omit the value of community engagement.

The extent to which the global rankings are embraced by numerous universities and higher education agencies must be considered a matter of great concern. The validation of rankings as knowledge of universities ultimately corrodes knowledge and science.

Conclusion

Global university rankings fail to capture either the meaning or diverse qualities of a university, or the characteristics of universities, in a way that values and respects their educational and social purposes, missions and goals. At present, these rankings are of dubious value, are underpinned by questionable social science, arbitrarily privilege particular indicators, and use shallow proxies as correlates of quality.

Universities in the global South must refuse to play the game as formulated by the SJTUIHE and *THE*, even if others collude with rankings for the sake of self-aggrandisement. Rather than permitting these rankings to prescribe a 'gold standard' and impose narrow definitions of quality, quality should be regarded as historically specific and related to institutional missions and goals as well as to educational and social purposes.

My critique of global university rankings is not a refusal of critical public scrutiny of universities or of universities in the global South. Besides rankings, there is much value in performance indicators and benchmarks if they are carefully conceptualized and designed with clarity of purpose, and are respectful of institutional missions and policy goals. Performance indicators have an important role in institutional development and, through these, the achievement of national socio-economic development priorities. Clearly, effective monitoring, evaluation and critical reviews of universities, including their goals, strategies, academic programmes, administration, governance and financial management, also have key roles in university development.

The challenge for universities in the global South is to effectively replace global rankings with alternative instruments that genuinely serve educational and social purposes, contribute to innovation and development in universities, enhance transparency in and critical public scrutiny of universities, and facilitate informed choices and judgements on the basis of robust social science and appropriate methodologies.

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7.2 Assessment and evaluation of research

Introduction

Alongside cross-national or worldwide comparisons, national governments and agencies have stepped up efforts aimed at the evaluation of the quality of research, the identification of productive individual researchers and the performance of departments on various criteria. These exercises are undertaken both to boost research performance and to optimize resource allocation. It is nonetheless clear from the contributors to this section that all this is not as easily done as said.

The UK's Research Assessment Exercise (RAE) is probably the best-known of the various assessment exercises carried out in countries such as New Zealand, Australia, the Netherlands, Romania, Germany and South Africa. In this RAE, panels of experts evaluate information on inputs and outputs provided by university departments. Even if they tend to be better regarded than simplistic international rankings, these assessment exercises have received considerable criticism of, and resistance to, the methodologies they adopt. They are also criticized for the perceived negative effects they have on the social sciences. Large-scale research assessment exercises such as the RAE involve considerable costs in terms of money, human resources and time. In combination with the level of bureaucracy they involve, these costs have led some national agencies to consider a more metrics-based approach, which has advantages in terms of cost savings and a supposedly higher objectivity.

However, the use of bibliometrics in the evaluation of social science and humanities faces considerable problems (Archambault and Larivière). The dominant bibliographical databases used for these analyses have a strong linguistic and geographical bias. This, many would argue, makes them less suitable for the evaluation of research outside the Anglo-Saxon world. The use of bibliometric indicators in the social sciences and humanities is also problematic for other reasons. Publications other than journal articles, such as books, reports and even non-academic outlets are considerably more important here than in the natural sciences. These other publication formats, as well as a large number of less prominent journals, are not included in the international citation indices and are therefore invisible to evaluations which rely on them. Another potentially problematic point is that much social sciences and humanities research aims for local rather than international relevance and may not be noted in the international literature. The Thomson Reuters Social Science Citation Index (SSCI) and its recently established competitor, Elsevier's Scopus, do engage in efforts to broaden the inclusion of non-English journals, which may alleviate some of the linguistic and geographical bias even if the intensity of citation traffic is likely to continue to favour the Anglo-Saxon world. Weingart and Schwechheimer highlight the specific limitations of the exclusive use of bibliometric tools in the evaluation of research performance in countries where only a small number of articles are published in international peer-reviewed journals. Other, qualitative, approaches may be more fruitful in such cases. While the use of bibliometrics for the evaluation of social science research is problematic in isolation, it can help support qualitative reviews (Weingart and Schwechheimer; Hazelkorn).

Research assessment exercises should combine indicator-based quantitative data with qualitative information, recognize the differences between research disciplines, include assessments of impacts and benefits, and therefore include indicators that are capable of capturing all of this (Hazelkorn). The review of the UK Research Assessment Exercise, however, highlights the complexity of designing a national assessment system that is both fair and effective (Oancea).

In Spain, bibliometric indicators are used for the evaluation of individual researchers (Cruz-Castro and Giménez-Toledo). Researchers' output in journals included in international as well as Spanish-language bibliographical databases is presented to national evaluation agencies. These and other outputs are used to support individuals' peer review evaluations when they apply for accreditation and salary bonuses. Taking into account quality Spanish-language journals as well as discipline-specific factors in the evaluation procedure may help overcome some of the previously noted limitations of bibliometric assessments.

Conceptualizing and measuring excellence in the social sciences and humanities

Peter Weingart and Holger Schwechheimer

Bibliometric analysis is a means to identify prominent researchers, important research results, and institutions that foster good research. The data banks are used as a tool for the evaluation of research as it is reflected in publications and for studies of communication patterns. For this purpose so-called bibliometric indicators have been constructed.

The easiest way to identify prominent researchers, important research results and institutions fostering good research is by way of bibliometric analysis. The principal sources of information for bibliometric analyses in social sciences and humanities are the SSCI and the Arts and Humanities Citation Index (A&HCI). These data banks provide a combination of information about the authors of a given article, their institutional address(es), and the article's citations of other papers. This means that searches can be made targeting authors, their institutions or the number of citations received by an article. These data banks have also been used as a tool for the evaluation of research as it is reflected in publications and for studies of communication patterns, in other words of social structures in science generally. For this purpose so-called bibliometric indicators have been constructed. The most important bibliometric indicators for activity (publications) and impact (citations) are:

- P: number of publications (indicating the activity in formal communication)
- C: number of received citations (indicating the visibility or impact of research but usually being taken as an indicator of the quality of research)
- CPP: citations per publication
- CPP/FCSm: normalized citation rate (against Field Citation Score mean).

To normalize citation rates per publication, which differ widely between disciplines, the absolute citation count is divided by the average citation rate of all publications of the same discipline or journal from the same year of publication. If computed for a sufficient number of publications, this indicator is widely accepted as a reliable measure for visibility in most areas of the natural sciences.

However, in the social sciences and more so in the humanities, this form of application is highly problematic, because of the inadequate coverage of books in the citation indices. In the social sciences and humanities, we cannot rely on the reliability and validity of these indicators in the same way as in the natural sciences because of the non-paradigmatic nature of most fields in the social sciences and humanities, the heterogeneity of publication behaviours between fields in the social sciences and humanities, and the insufficient coverage of the principal sources of information for bibliometric analyses in the SSCI and A&HCI. The latter is changing, at least for the social sciences, as a result of an increasing internationalization due to incentives for non-English-speaking authors to publish in English. This is particularly true for the European countries, where funding programmes promote publication in English in order to achieve the integration of European research.

To illustrate the problem, consider publications from the countries of the Commonwealth of Independent States and listed in the SSCI and the A&HCI. They show that in all these countries except the Russian Federation and Ukraine, the number of publications is in the tens or single digits. This means, in effect, that we cannot speak of social sciences and humanities communities in these nations, but at best of individual scholars who work more or less in isolation. The numbers themselves do not reveal any trend, whether towards higher or lower numbers of papers, with the exception of the Russian Federation and the Ukraine where the absolute numbers of articles published and

included in the two indices show a downward trend. The actual number of scholars and their output remains unknown because we cannot control for the percentage of coverage of CIS articles in the SSCI and A&HCI. Under such circumstances the application of bibliometric techniques is out of the question.

While in cases such as these, bibliometric indicators are insufficient by themselves to provide reliable assessments, they may be used in conjunction with other indicators and descriptions. For example, visibility in international peer-reviewed journals whose quality standards are established is one indicator of good international standing. However, the results must be controlled for the size of the national social sciences and humanities communities, as it may be the case that only a small number of individuals appear in these journals, representing a very small fraction of the particular national community. Such a lack of visibility may have different reasons: for example, politically motivated limitations to access, or resentment of international cooperation. Thus, publications in international journals, like cooperative authorships with international scholars, should not be taken as definitive indicators of quality of research, but rather as relative, and above all merely as descriptors. They do not reflect the potential quality of work done in the national context and hidden from international view.

As to qualitative assessments of the health and quality of social sciences and humanities research, we suggest two sets of criteria: organizational and intellectual.

Organizational criteria are about both conditions for research and expressions of research culture. A healthy-social sciences and humanities culture should have sufficient size to allow for a plurality of approaches and methods. Crucial questions are whether the social sciences and humanities have normal department status, where their students find employment after their studies (for example, in academia, as teachers, in industry, public administration or in the media), and whether the social sciences and humanities are represented in national scholarly associations and professional societies.

Intellectual criteria are at the core of any assessment of the health and quality of a discipline or research field. Social sciences and humanities do not have to be integrated into an international scholarly discourse to the same degree as the natural sciences in order to be qualitatively of a high standard. Those research activities that are more narrowly focused on national and culturally specific subject matters and topics must be judged on their own merits. They must, above all, exhibit originality in their theories and methodologies. Indications of this are lively intellectual debates among the relevant scholarly communities, a recognizable progress of research over time, and in the ideal case, an impact on public debates.

An important prerequisite is the existence of independent peer-reviewed scholarly journals and, especially in the case of the humanities, of more popular journals or print media catering to the intellectual elite of the country. Social sciences and humanities that are entirely dependent on a few external sponsors or are only small inbred circles can hardly prove their value to civil society. Nor will they be open to intellectual stimuli from outside.

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The limits of bibliometrics for the analysis of the social sciences and humanities literature

Éric Archambault and Vincent Larivière

There are several limits to the use of bibliometric analysis of scholarly communication in the social sciences and humanities. This paper reviews three of those limits: the lower proportion of social science and humanities journal articles; social sciences and humanities literature's ageing rate, and conversely its post-publication citation rate; and the local relevance of social sciences and humanities knowledge. It also discusses the choice of bibliometric databases when measuring social sciences and humanities research.

While the use of bibliometrics for policy purposes has mostly been limited to the natural and medical sciences, this emphasis is now changing. However, the extension of bibliometrics as an evaluation approach to the social sciences and humanities (SSH) may be a cause for concern unless due care is taken. There are several limits to the use of bibliometric analysis of scholarly communication in the social sciences and humanities (for instance, Glänzel and Schoepflin, 1999; Hicks, 2004; Larivière et al., 2006). Drawing on previously published data and original data, this paper reviews these limits.

Three issues are presented: the lower proportion of SSH journal articles; social sciences and humanities literature's ageing rate, and conversely its post-publication citation rate; and the local relevance of social sciences and humanities knowledge. The choice of bibliometric databases when measuring social sciences and humanities research is also discussed.

The importance of books and serials in social sciences and humanities knowledge diffusion

The importance of adjusting and clearly stating the limits of bibliometric methods becomes apparent when we consider the importance of books and other documents in the process of scholarly communication in various domains. Hicks (2004) argues that books form a sizeable part of publications in some social sciences and humanities disciplines, that they are also cited more often than other forms of publication, and that this impact cannot be extrapolated from that of journal articles. Thus, the validity of evaluations using bibliometric methods can only be assessed properly if the share of the various types of documents used in scholarly communication is known.

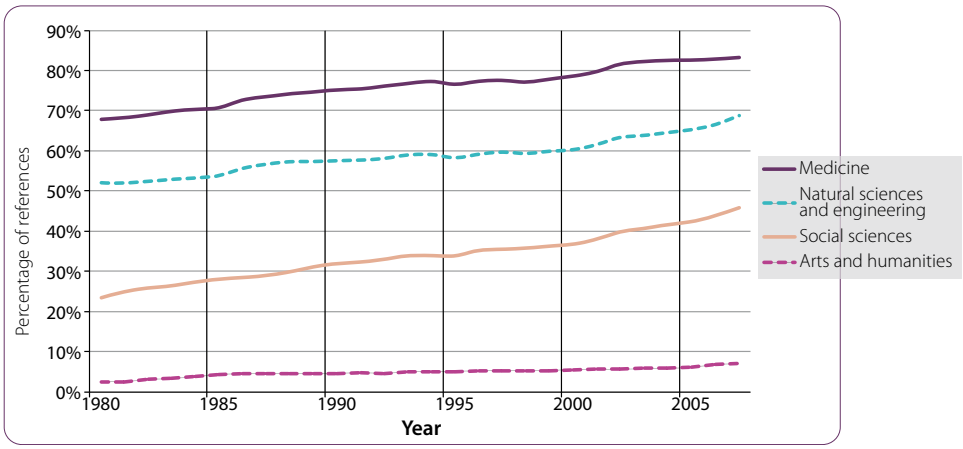
Numerous studies provide data on the relative proportion of journal to non-journal forms of publishing. In their analysis of social science co-citation clusters, Small and Crane (1979) found that 39 per cent of items cited in sociology and 24.5 per cent in economics were books, compared with only 0.9 per cent in high-energy physics. Based on these results, Hicks (1999) estimated that between 40 and 60 per cent of the literature in the social sciences is composed of books. In addition, Leydesdorff (2003) found that whereas 79 per cent of citations in articles covered by the Science Citation Index (SCI) were citations of other articles in the database, this percentage was only 45 per cent for the SSCI (a database produced by Thomson Reuters together with the SCI and the A&HCI). Glänzel and Schoepflin (1999) found that the percentage of references to serials varied between 35 per cent in history, philosophy of science and the social sciences and 94 per cent in immunology.

Building on a method presented at length in Larivière et al. (2006), Figure 7.1 presents the percentage of references made to papers indexed in the Thomson Reuters WoS by field (using articles, notes and reviews). The proportion of references made to WoS-indexed papers varies significantly across fields, with medical papers (MED) citing more than ten times the number of WoS-indexed papers or articles in the arts and humanities (A&H). In the natural sciences and engineering (NSE), slightly less than 70 per cent of the references are to WoS-indexed material, whereas this percentage is just under 50 per cent in the social sciences. These data suggest that A&H, including fields such as literature and philosophy, would be best examined using instruments that also consider other types of publications, such as books. The social sciences and the arts and humanities differ significantly from each other in terms of how frequently they refer to papers.

Rates of literature ageing and citation

The rate at which scientific literature ages and the rapidity with which it is cited have important implications for the way in which scientific impact must be measured in different academic fields. These patterns are particularly important in determining the length of the citation windows used for citation counts. To measure the NSE paper citation rate, a short window (typically two or three years) is frequently used, as knowledge is rapidly diffused and cited. As can be seen in Figure 7.2, in A&H references

Figure 7.1 — Share of references made to journal articles indexed in the WoS, by field, 1980–2007



Source: Saisan and D'Hombres, 2008, pp. 19-21

Figure 7.2 — Median age of cited literature by field (100-year citation window), 1980–2005

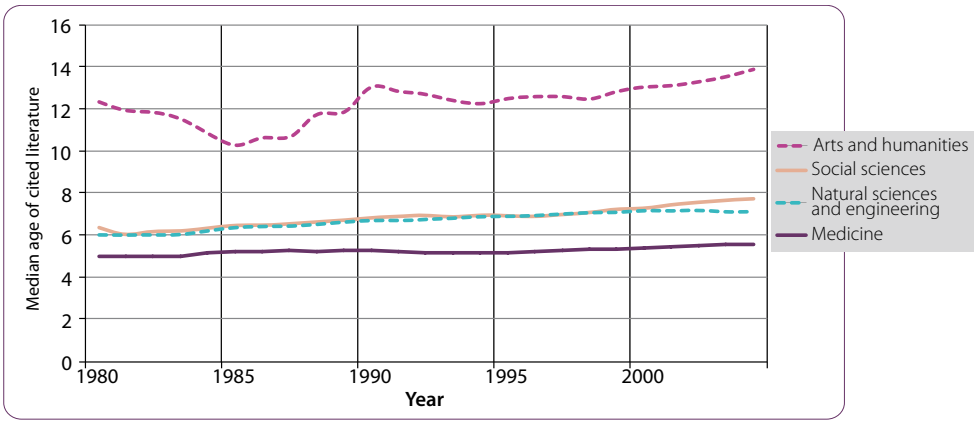


Figure 7.3 — Citations of papers per year following publication

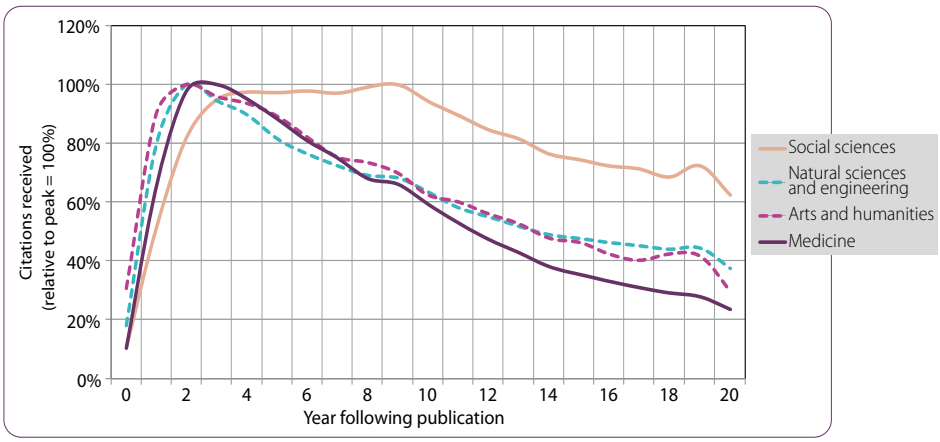


Table 7.3 > Coverage by Scopus and WoS of a sample of Canadian social science and humanities papers, 2009

Language of paper	Scopus		WoS		Scopus & WoS		Sample
	Coverage	(n)	Coverage	(n)	Coverage	(n)	(n)
English	53%	120	43%	97	58%	132	226
French	16%	10	7%	4	20%	12	61
Coverage Canadian sample	45%	130	35%	101	50%	145	289
English as multiple of French coverage	3.2		6.5		3.0		

Source: Compiled by Science-Metrix using Scopus and the Web of Science (WoS) (online versions, week of 23 March 2009).

are made to documents that have a median age twice that observed in other scholarly domains. The useful life of knowledge produced in A&H is longer than in other fields. This suggests that a longer citation window should be used when measuring impact in those fields. In social sciences, the age of what is cited differs from A&H and is highly similar to NSE.

Whereas Figures 7.1 and 7.2 examine how papers refer to the past in their references, Figure 7.3 shows the pattern of citations of papers after their publication. Papers in MED, NSE and – surprisingly – A&H are cited rapidly after publication, but the citation rate drops fairly quickly. Papers in the social sciences are less readily cited and only reach their citation peak some ten years after publication. The implication is that we should allow for longer citation windows when examining the impact of research in the social sciences than for NSE and MED. A window of approximately five years might be the minimum required to determine the effect of a social sciences and humanities publication on the community.

The local relevance of social science and humanities knowledge

Another aspect requiring careful consideration when performing bibliometric analyses of the social sciences and humanities is the relatively local orientation of social science and humanities research. Whereas the problems identified in the NSE tend to be universal by nature, social science and humanities research topics are sometimes more local in orientation. The target readership may be limited to a country or region (Glänzel, 1996; Hicks, 1999, 2004; Ingwersen, 1997; Nederhof et al., 1989; Nederhof and Zwaan, 1991; Webster, 1998; Winclawska, 1996). In many cases, the concepts and subjects covered in social sciences and humanities can be expressed and understood only in the culture that shapes them. Social science and humanities scholars reportedly publish more often in their mother tongue, and in journals with a limited distribution (Gingras, 1984; Line, 1999).

To assess the coverage of national literature by Thomson Scientific, Archambault et al. (2006) compared the journals list covered by its citation indexes with a comprehensive source of scientific journals from all over the world – the Ulrich directory. This showed that journals with UK editors were heavily over-represented in the Thomson Reuters database, especially in the social sciences and humanities. According to Ulrich, 18 per cent of journals have a UK-based editor. The Thomson Scientific figure is 27 per cent – an over-representation factor of 55 per cent. Social science and humanities journals with editors located in the Russian Federation, the USA, Switzerland, and the Netherlands are also over-represented, whereas virtually all other countries are under-represented. Archambault et al. (2006) also considered the actual language of journals. This revealed a clear selection bias in favour of journals in which the articles were written in English. Whereas 75 per cent of peer-reviewed journals indexed in Ulrich are in English, the Thomson Scientific figure is 90 per cent – an over-selection rate of about 20 per cent.[1] This evidence shows that in respect of the combined SSCI and AHCI coverage, there is a 20 to 25 per cent bias in favour of English-language scientific output in the SSH. Furthermore, French, German and Spanish journals are under-represented by 28, 50 and 69 per cent respectively.

Choice of bibliometric databases and indicators

Traditionally, most bibliometric studies have been based on the Thomson Reuters WoS, but Elsevier's Scopus database is becoming a legitimate alternative. Although there is evidence that WoS and Scopus are by and large congruent in their global content and in the NSE (Archambault et al., 2009), the social sciences and humanities coverage evidence is unclear. Examining the extent of WoS and Scopus's coverage in the context of Canadian social science and humanities research diffusion is therefore relevant. Canada, having both English-speaking and French-speaking scholars, is an interesting case. A random sample of 300 papers was drawn from the annual reports of researchers supported by the Social Sciences and Humanities Research

1. Gingras and Mosbah-Natanson (in this Report) give different estimates for the difference in English-language social science and humanities journals included in the WoS and the Ulrich directory. Their assessment refers to 'academic and refereed journals' whereas this paper states 'peer-reviewed journals'. Because the second is a subset of the first, both statements seem consistent with each other.

Council (SSHRC). Following the exclusion of a few anomalies, and with a resulting sample of 289 Canadian scholarly papers, the Scopus coverage was determined at 45 per cent and the WoS coverage at 35 per cent. Combining the two databases would not necessarily lead to a cost-effective solution, as the combined total coverage was 50 per cent – that is, five percentage points more than Scopus alone. Importantly, papers written in English are 3.2 times more likely to be covered by Scopus, which covered 16 per cent of French-language papers, whereas English-language papers were 6.5 times more likely to be covered by WoS. Based on this evidence, Scopus is slightly better overall, and much better at covering French-language research diffusion. In addition, Scopus is set to further expand its coverage of humanities journals. A sizeable number of Canadian journals will soon be added, thus increasing the gap between the two databases.

Overall, these data show that we cannot effectively compare the scholarly output of French-speaking and English-speaking Canadian scholars using these databases. By extension, it would be misleading to use these databases to compare the social sciences and humanities production of Canada's different provinces.

The data presented here show that social sciences and humanities knowledge production can be observed using bibliometric methods only when the greatest care is taken. The existing peer-reviewed journal databases are incomplete and do not satisfactorily cover languages other than English. This means that whenever language issues influence output in one way or another, it is impossible to perform robust comparisons, let alone rankings. This is not to say that questions cannot be studied using bibliometric methods; it simply means that we must be careful when drawing normative conclusions, especially if the questions examined are likely to be shaped by linguistic and geographic variables. In particular, developing countries are certainly under-represented, especially those that are not English-speaking. Moreover, as always, it is perilous to compare fields (such as the social sciences and the humanities) if the morphology of scholarly communication in each area is not taken into account. It is, for instance, important to bear in mind that books are the preferred mode of knowledge dissemination in the humanities. Furthermore, the current databases are not reliable enough to allow for the computing of statistics on book-based diffusion and the associated impact as measured in respect of books.

The development of a robust bibliographical book database comprising complete references as well as more universal coverage of social sciences and humanities journals would expand our capacity to understand social sciences and humanities knowledge diffusion and use. As long as our tools remain non-existent or limited, the bibliometric analysis of the social sciences and humanities will be less comprehensive than that of the natural sciences. Perhaps too much effort has been spent discussing what is good and what is not, and hence on what should be included in and excluded from databases. With the rapid development of electronic data interchange, inclusiveness and extensiveness should be the goal. Knowing that the supposedly best journals are included in the Thomson Reuters database is of no use when we want to understand how, for example, research on education has evolved in African countries over the past ten years. There are many relevant questions that bibliometric methods can help answer; however, for the time being, the most important question overall is how long we have to wait until this can be done.

Éric Archambault and Vincent Larivière

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Pros and cons of research assessment

Ellen Hazelkorn

Rankings and research assessment have become an integral part of higher education and publicly funded research. Research assessment is a means, at both the national and institutional level, for boosting research performance and quality, and optimizing resource allocation. International evidence shows, however, that ranking and assessment processes can have perverse effects, especially when indicators are considered in isolation and simple correlations are made.

Why assess research?

Rankings and research assessment now form a permanent and necessary part of higher education and publicly funded research. Research assessment is an important mechanism, at both the national and institutional level, for boosting research performance and quality, optimizing resource allocation, differentiating missions and institutional profiles, facilitating international benchmarking, and identifying peers for networking and strategic alliances. It also serves as a tool to increase public awareness and understanding and hence participation in broader discussions about higher education (IHEP, 2009, pp. 1–2). Because research assessment requires improved data collection, it can be beneficial for strategic planning and management, and institutional autonomy.

International evidence shows that ranking and assessment processes can have perverse effects, especially when indicators are considered in isolation and simple correlations are made. The evidence also shows that a number of governments, higher education institutions (HEIs) and researchers are making decisions and realigning their priorities in order to match indicators. This includes over-concentrating research in a few elite HEIs, focusing on particular disciplines (primarily the sciences), and neglecting local or regional issues in order to publish in high-impact international journals. Throughout the world, governments and HEIs have rewritten strategies and priorities, and have made significant changes at both the system and institutional level in order to improve their position in global rankings (Hazelkorn, 2008).

As indicators are not value-free, the chosen methodology and the interpretation of the results can have considerable implications and carry numerous risks. Throughout this section, we discuss the limitations of some frequently used indicators, and offer some possible alternatives for a 'good practice' model.

Limitations and unintended consequences

Research assessment and ranking can share a number of characteristics. They both seek to benchmark higher education performance on the basis of selected, and sometimes weighted, indicators. Rankings rely heavily on traditional research outputs captured in international bibliometric and citation databases, such as Thomson Reuters WoS and Elsevier's Scopus. The scores are aggregated into a final descending rank. Rankings are essentially one-dimensional, since each indicator is considered as independent from the others. Their popularity is largely related to their simplicity; as with restaurants, televisions or hotels, rankings of universities provide an easy guide to quality, at least at first glance.

In contrast, research assessment is often a multifaceted review of performance, conducted by public agencies, using qualitative and quantitative indicators. The UK's Research Assessment Exercise (RAE) is a good example of this. Organized every four years since 1986, it is based on institutional submissions in subject areas or units of assessment, which are ranked by a panel of subject specialist peer reviewers. The results determine the level of resource allocation. This is in sharp contrast to other systems that focus mainly on quality assurance, such as in the Netherlands. In recent years, concern about the financial cost, the human resources and time needed, the level of bureaucracy and allegations of 'gaming' have led to the adoption of a more metrics- or indicator-based system. Like the UK, Australia has abandoned its Research Quality Framework (RQF) in favour of the Excellence in Research for Australia Initiative (ERA).

The results of research assessment are rarely ordered in a hierarchical manner, but the publication of their results by the media or other organizations has often led to the production of a 'league table' of HEIs. This practice has facilitated the restructuring of the higher education system, and has arguably led to a growing convergence between assessment and rankings.

Bibliometric and citation databases seek to identify the core literature by selecting journals that publish the overwhelming majority of peer-reviewed articles (around 9,000 in WoS and 18,000 in Scopus). While there are efforts to extend coverage to arts, humanities and social science journals, the main beneficiaries of this methodology have been the physical, life and medical sciences. This is because these disciplines publish frequently with multiple authors. In contrast, the social sciences and humanities are likely to have single authors and to publish in a wide range of formats (monographs, policy reports, translations and so on), whereas the arts produce major art works, compositions and media productions, and engineering focuses on conference proceedings and prototypes.

Since, as Thomson Reuters say, 'English is the universal language of science at this time in history', international databases have tended to favour English-language publications. This disadvantages the social sciences and humanities, which often consider issues that are primarily of national relevance, and publish them in the national language. It can also benefit countries where English is the native language, and countries that publish the largest number of English-language journals.

This disparity is further reflected in citation practices. Citations aim to measure the impact of research on academic knowledge. The system, however, has natural limitations and is open to gaming. Authors are most likely to reference other authors whom they know. Given an intrinsic tendency to reference national colleagues or English-language publications, the reputational or halo factor implies that certain authors are more likely to be quoted than others. This may occur because of the significance of their work, or because of informal networks. Self-citation, by which authors reference their own work, can also have a knock-on positive affect.

Bibliometric and citation databases capture past performance, which is usually interpreted as an indicator of future potential. As a result, new research fields and interdisciplinary research can be neglected. It is sometimes hard to get papers that challenge orthodoxy published, or they are less likely to be published in high-impact journals. There is an underlying assumption that journal quality is a proxy for article quality.

> *Because articles published in new journals remain invisible to most citation indices, they also remain invisible to almost all ranking systems. Such invisibility dramatically skews scholarship … implicitly encourag[ing] conservatism …*
>
> (Adler and Harzing, 2009, p. 78)

By measuring impact in terms of papers cited by academic peers, citation and bibliometric indices can ignore research that affects policy, legislation or regulatory regimes, technological or social interventions, business creation and employment, and other non-scholarly forms of impact. This is a key omission – not just because it advantages certain disciplines over others, but because it projects a narrow image of research.

Research has traditionally been divided into two categories: basic and applied. Over time, these boundaries have tended to blur as research and researchers engage in all aspects of the knowledge triangle. Knowledge has also become more democratized as an increasing number of people become aware of the issues and contribute to the application of knowledge. Yet collaborative research and its social impact or economic benefits do not usually form a central feature of assessment. Admittedly, social impact or economic benefits can be difficult to measure, but its value, to paraphrase Einstein, derives from the ability to measure what counts rather than what can easily be measured.

Peer review represents a cornerstone for research assessment. Assessing research quality requires a detailed understanding of the field and its contribution to knowledge. But peer review also has its limitations. Evaluators often assess research in terms of what they know; novel and challenging ideas can be marginalized, as noted above. Marginson notes, 'Not all path-breaking innovations gain early peer recognition and some are sidelined precisely because they challenge established ideas' (2008b, p. 17). Peers often conform to conventionally accepted patterns of belief, and may be influenced by a researcher's reputation rather than their actual contribution to knowledge.

Finally, the results of the research assessment process are usually publicized as institutional results. Because research is increasingly conducted by teams, individual performance data is aggregated using the research field, discipline or department as the unit of assessment. (Individual

performance usually serves for promotional or award purposes.) While this method offers the best opportunities for comparison, both within and between HEIs, comparisons at the department level can be problematic, because departments are often historical constructs. Nevertheless, it is best to assess research at the subinstitutional level in order to overcome the natural distortions that arise when results are aggregated to the institutional level. This is because large HEIs, especially those with medical schools, do best in systems that simply quantify total output, such as global rankings. Most HEIs are excellent in certain domains and in need of improvement in others. Whole-institution comparisons brand everything according to the majority. Differences in disciplinary practice, or new or emerging fields of investigation, can be undermined by this method.

Research assessment 'good practice'

In order to overcome many of these limitations, careful attention must be paid to the purpose of research assessment. Its purpose depends on the end user: for example, policy-makers and government agencies, HEIs, public or private research organizations, potential researchers or graduate research students, employers, civil society and the media. Each group uses information differently to satisfy a diverse and often conflicting set of objectives. The experience of rankings suggests that the number of users and uses is increasing, and that it is not possible to control the ways in which people use or interpret the data once it has been published.

The choice of indicators is therefore vital. The results can impact on individual, institutional and national reputation and status, students' choices and opportunities, and our own understanding of knowledge and knowledge production (Hazelkorn, 2009). Thus, indicators should be appropriate and verifiable, and the process must be transparent and replicable. It should enable decision-making by internal and external users, and facilitate comparisons over time and across different types of HEIs. Indicators should not be affected by any bias, and they should instil trust. In other words, those being assessed must believe in the indicators' appropriateness and truthfulness. Having too few indicators can lead to distortion. Too many can make the exercise complicated and costly. Ultimately, the choice and weight of indicators should seek to strike a balance between fairness and feasibility (European Commission, 2006; Cañibano et al., 2002). 'Good practice' suggests that research assessment should:

- Combine indicator-based quantitative data with qualitative information, for example, information based on expert peer or end-user assessment. This enables the quantitative information to be tested and validated within the context and purpose of the assessment.
- Recognize important differences between research disciplines. Peer-reviewed journal articles are the primary publication channel for practically all academic disciplines. However, the complexity of knowledge has led to a diverse set of output formats: audiovisual recordings, computer software and databases, technical drawings, designs or working models, major works in production or exhibition, award-winning designs, patents or plant breeding rights, major art works, policy documents or briefs, research or technical reports, legal cases, maps, translations or editing of major works within academic standards, and others.
- Include impact and benefit assessment. Assessment should include indicators capable of capturing and recognizing the fact that research does not exist in isolation. This may differ along disciplinary lines. It may include indicators such as graduate employment, the number of companies established and employees hired, changes to policy, legislation and regulatory regimes, waste and pollution reductions or improvements in health care (see Australian Government, 2006). Stakeholder esteem indicators point to how research is viewed by the wider community. Among such indicators, we find keynote addresses; prestigious national and international awards and prizes; international visiting research appointments; and appointments to advisory committees in national or international organizations. The involvement of stakeholders or users in the process could be considered.
- Involve self-evaluation as a means of proactively including the research community in the assessment of its own contribution. It also represents a way of placing the research process – which includes the organization, management, and developments over time – in context and ensuring that it stays in line with the institution's mission (Spaapen, Dijstelbloem and Wamelink, 2007).

Conclusion

The European Council's 2006 communication, *Delivering on the modernisation agenda for universities: education, research and innovation*, illustrates the ways in which the legacy of rankings has become embedded in higher education policy:

> *Universities should be funded more for what they do than for what they are, by focusing funding on relevant outputs rather than inputs. … Competitive funding should be based on institutional evaluation systems and on diversified performance indicators*

with clearly defined targets and indicators supported by international benchmarking.

This has implications not only for research assessment processes but for academic behaviour as well. There has been a clear shift from self-declaration to external verification of quality. Greater attention is being given to the issue of knowledge access. Open science, open source and institutional repositories are just some of the many existing alternatives that are being explored and adopted. In some cases, national agencies are pressing for these changes in order to maximize the visibility, accessibility and scientific impact of knowledge for society and the economy.

An important obstruction to a more inclusive research assessment process lies within academia itself. Because research has the 'capacity to shape academic careers at the point of hiring and promotion' (Marginson, 2008, p. 17), it has become vital to identify indicators and methodologies that measure, assess and reward the full spectrum of research activity – across all disciplines, including interdisciplinary work, and all discipline outlets. This will help to incentivize academia, increase investor confidence and inform the public. It is also vital because a major handicap for researchers engaging in new forms of knowledge production is that recruitment, tenure, promotion and prestige still reward traditional, disciplinary Mode 1 outputs.

While governments and national agencies may wish to set up simple processes, there is no single set of value-free indicators. Thus, the choice of indicators, the methodology used and the weightings assigned to them are vital. Greater attention needs to be given to all these factors in order to ensure that the process is fit for purpose and avoids producing unintended consequences.

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Research assessment in the United Kingdom

Alis Oancea

The UK has been assessing higher education research at the national level since the mid-1980s via the Research Assessment Exercise (RAE). Every four years, departments have collected information on staffing, research income, research students, publication outputs, indicators of esteem and research environments. The submissions have then been peer-reviewed and graded. The resulting ratings of research quality have been used by national higher education public funding bodies in their funding and policy decisions.

Background

The assessment of higher education research at the national level in the UK has been carried out since the mid-1980s via the Research Assessment Exercise (RAE). Every four years (on average), departments have collected information on staffing, research income, research students, publication outputs, indicators of esteem, and research environments. The submissions have then been peer-reviewed and graded (from 1 to 4 in 2008) by subject panels and subpanels, consisting of a mix of academics and users relevant to each field, who had agreed on subject-specific criteria in light of generic guidance. The resulting ratings of research quality were used by national higher education public funding bodies in their funding and policy decisions. Up to 2008, only those departments that had scored highly in the RAE were subsequently funded. In 2008/09 funding was spread more thinly, not on the grounds of overall grades, but on the basis of departmental 'quality profiles'.

The RAE initially met with widespread support as a potential solution to problems generated by the expansion of higher education. The 1992 Further and Higher Education Acts had almost doubled the number of UK universities by granting university status to institutions formerly known as polytechnics. The argument was that the expansion had made block-funding for research, with low accountability levels, unsustainable.

The benefits of the exercise for the social sciences, aside from arguably putting research more firmly on the public agenda, included:

- development of research cultures in post-1992 universities
- enhanced management practices and structures in research units
- increased attention to human resources in research
- improved completion and publication of research
- better overall quality and international standing of research (Harley, 2002; Elton, 2000; McNay, 1997).

Initial support soon became concern. Assessment and funding, although separate processes, were inextricably linked in how most people saw the exercise and in institutions' strategic decisions, particularly as the exact amount of funding was only made known after the end of the assessment process.

Common concerns about the RAE

Research governance and administration

The exercise was accused of promoting an excessive concentration of funding (AUT, 2002) and of weakening the UK's 'dual support' system for research funding, which allocates block grants for research infrastructure separately from competitive grants for individual projects and programmes. Others, on the other hand, worried that the RAE had spread existing resources too thinly, particularly following the expansion of the university sector in the early 1990s (Elton, 2000), and after RAE 2008.

Managing the RAE created a considerable administrative burden at all levels of the system, seen by many as an excessive and stressful bureaucracy (AUT, 2002). For some, the RAE increased managerial control over research, to the detriment of professional autonomy (Harley, 2002). Further department-level impacts of the RAE included a perceived shift in the role of research directors from developer to fund-raiser (Dadds and Kynch, 2003), and resource transfers from teaching to research (McNay, 1997).

Research quality and diversity

It has been argued that RAE was aimed at eliminating wasteful funding, rather than rewarding excellence (Gillies,

2007). Less conventional, though arguably important, research and researchers may have fallen victim to the rigours of assessment and reward. In addition, the RAE was accused of making research more 'short-termist', due to pressures to publish, and the encouragement of bad practices (split papers, duplicate publication, mushrooming of new journals and so on).

Recent proposals to use bibliometric indicators in future research assessments seemed partly intended to redress such negative impacts by giving greater weight to quality-reviewed publications. These proposals, however, have led to further concerns about biasing assessments towards refereed journals (for example, those included in indexes such as ISI and Scopus), to the detriment of professional publications, monographs and edited books.

In addition, RAE has often been accused of failing to recognize and support diversity in research. For example, it was accused of discouraging innovative, applied and interdisciplinary research, while tilting professionally related subjects towards theoretical work (Elton, 2000; McNay, 1997); favouring policy-related research; or endangering pedagogic research. In addition, RAE-informed concentration of funding may have resulted in reduced regional research capacity (Deem, Mok and Lucas, 2008).

Many have argued that the RAE has been successful when it came to screening out poor-quality research through peer review, but that its financial outcomes threatened 'emerging' research cultures and 'pockets of expertise' in various subfields of social research (Dadds and Kynch, 2003). The 2008 exercise offered an interesting 'natural experiment' in this respect. In 2008, there only needed to be one individual with excellent outputs in order for their institution to benefit from some level of funding. Although the principle underpinning the new formula was sound, a fresh wave of concern emerged regarding its 'redistributive' effects: gains in funding throughout the system were offset by considerable losses by the top-rated institutions, particularly in fields outside science, technology, engineering and mathematics.

Human resources and work climate

Further concerns were expressed regarding the detrimental impact for individual staff members of not being submitted to the RAE as 'research active' and about the imposition of the role of 'active researcher', above that of 'teacher' or 'scholar', as the standard in academic careers (AUT, 2002; Elton, 2000; Hare, 2003). According to Harley (2002), although the RAE and the principle of research selectivity it embodied had been largely accepted within university management circles, mid- and early-career academics reported feeling under pressure to perform and to adapt to what they perceived as inappropriate criteria. Mills et al. (2006) also pointed to the negative influences of 'local interpretations' of the 'RAE culture' on the careers of young researchers; for example, the expectation, based on anticipated funding outcomes, that they produce four publications of 'RAE standard', despite the provision for special circumstances in RAE guidelines (Mills et al., pp. 13, 91). The RAE was also blamed for contributing to increased reliance on short or fixed-term employment contracts in social science research (Mills et al., 2006).

In addition, many commented on the role of the RAE in creating a 'transfer market' of researchers towards 'elite' institutions. Harley's (2002) respondents spoke of 'head-hunting and touting', and of 'RAE appointees', that is, 'academics … appointed to senior posts specifically to boost RAE ratings' (pp. 193, 199). Such transfers were reported to have occurred prior to each exercise in a bid to increase the chances of a good grade, but also following the publication of the funding outcome, due to the increased capacity of top-rated institutions to recruit and sustain larger numbers of staff. The financial outcomes of the RAE 2008, however, meant that in certain disciplines the top-rated institutions lost some of their financial power to further recruit, while departments with lower overall RAE rankings were sometimes able, through their pockets of excellence, to advertise new positions.

Finally, some argued that the exercise stimulated a climate of divisiveness, unfairness and demoralization among researchers (AUT, 2002; Harley, 2002), as well as a narrowly 'competitive, adversarial and punitive spirit in the profession' and a skewed hierarchy of values, which emphasized research over teaching (Elton, 2000, p. 279; AUT, 2002). These changes challenged academics' 'epistemic' identity, which relied on collegiate peer review, disciplinary recognition, and a balance between teaching and research (Harley, 2002).

Technical and procedural concerns

The RAEs have been criticized for their summative character, for parochialism, for unclear criteria, and for their tendency towards bias. Sources of bias, in the preparation of submissions and in their assessment, included gender effects, 'halo' effects in relation to the reputation of institutions, journals or individuals, and 'game-playing'. Peer review quality was also occasionally criticized.

Concluding comments

Some of these concerns arose early in the RAE process and began to be addressed as early as 1997, when the Dearing Report recommended that institutions should be able to choose between the RAE and a lower level of non-competitive funding. The 2003 Roberts review then proposed an overhaul of the RAE system. Further consultation in 2006–2007 concentrated on the idea of replacing the RAE with a metrics-based exercise (Oancea, 2007). At the time of writing, this idea has been considerably toned down, following strong reactions from within academic circles. The next exercise, dubbed Research Excellence Framework, will still have peer review at its core, although in some disciplines bibliometrics would also play a role.

Although the emphasis of this paper has been on the RAE's shortcomings (perceived or proven), the paper does not argue that the exercise was flawed to the extent that any change would be good change. Many of the effects attributed to the RAE cannot be traced directly to the exercise. Rather, they were responses of the higher education system to wider trends in the UK environment for research policy and public service governance.

The responses to the RAE summarized in this paper highlight the complexity of any attempt to rank research, and the difficulty of designing a national assessment system that is fair and effective. A recent in-depth review of the impacts of RAE 2008 teased out some of these complexities (Oancea, Furlong and Bridges, 2010). The review revealed a mixed perception of impact. Recent proposals for reform have answered some of the reservations about the RAE described above, but leave most of the objections of principle unaddressed. For example, the presuppositions that underpinned different rounds of the exercise and which were open to challenge included expectations of:

- the value of creating quasi-markets in state-funded research through competition and selectivity
- the importance of high-stakes assessment as driver of quality
- the meaningfulness of aggregates of quality at institution level
- the commensurability of research quality across subfields, types of institutions, research cultures, and communities
- the direct connection between research concentration and research excellence.

Reforms must begin by reassessing such basic principles rather than placing too much hope in the search for generic techniques to fill substantively different holes in the system.

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Flash
The assessment of social scientists in Spain

Unlike many other evaluation systems, the Spanish research evaluation system tends to focus on individual researchers rather than on research organizations (Cruz-Castro and Sanz-Menéndez, 2007). The system acts as a provider of individual rewards (grants, salary bonuses, reputation and so on) rather than as a means of steering and managing research institutions. In such a system, peer review forms a core pillar for the evaluation of individual research outputs. Curricula vitae (CVs) are partly assessed in terms of publications, and the quality of the journals in which a researcher's papers appear. Peer commissions in evaluation agencies have used a diverse set of criteria to assess local social science journals in which researchers have published articles. These are complementary to the traditional bibliometric approaches (Giménez-Toledo, Román-Román and Alcain-Partearroyo, 2007).

Two of the three main evaluation bodies are the Agencia Nacional de Evaluación de la Calidad y Acreditación (ANECA, the National Agency for Evaluation, Quality and Accreditation), and the Comisión Nacional Evaluadora de la Actividad Investigadora (CNEAI, the National Commission for the Evaluation of Research Activities). The first agency provides accreditation in order for academics to access

certain university positions. The second evaluates the scientific output of tenured researchers on a six-year basis. Each successful evaluation leads to a salary bonus. They operate through subject area, academic commissions and a peer-review system. The scientific community is their key source of governance.

The main criteria used by these commissions to evaluate social scientists are available in various public documents.[1] We have analysed them in order to evaluate the extent to which the processes rely on bibliometric indicators when compared with other fields. ANECA strongly values publishing in indexed journals. However, this agency also makes certain distinctions. In the hard sciences such publications form a 'fundamental element' in any evaluation process, but in the social sciences they form an 'important element' together with books and book chapters. CNEAI, on the other hand, requires that in order to obtain a positive evaluation, social scientists must have at least two ISI articles in referenced journals out of the five required contributions. This forms a standard (with a few small variations) for most other research areas as well – mathematics and chemistry require three ISI publications. Looking at the evolutions in the CNEAI criteria over time, it could be argued that behind this standardization of ISI publication requirements was an attempt to develop the internationalization of the Spanish social sciences (Jiménez-Contreras, de Moya-Anegón and Delgado López-Cozar, 2003). Certain disciplinary specificities are noticeable. In the economic and business sciences, for instance, only articles published in journals that are highly ranked in the Journal Citation Reports[2] are taken into consideration. In other social sciences, an article is positively considered by the commissions if the journal is covered by the Indexes, regardless of its position in the Report.

Institutions and researchers have observed how certain well-known publications in their fields were not taken into consideration on the grounds that they were not present in the traditional databases. In order to deal with this problem, new tools and sources of information on the quality of the social science publications have been developed. The evaluation committees now also assess whether journals are well positioned or valued in other publication evaluation systems such as ERIH (European categorization of journals), Latindex, DICE,[3] In Recs[4] and RESH.[5]

To conclude, peer evaluations of Spanish social scientists regularly use data on publication quality. They do not limit themselves to traditional bibliometric indicators but also use complementary evaluations of local journals in which academics have published their research.

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1. http://ciencia.micinn.fecyt.es/ciencia and http://www.aneca.es
2. The Journal Citation Reports is a Thomson Reuters product related to the SSCI and SCI. It includes a selection of journals covered in these databases and provides among other things their impact factor. See more information at http://thomsonreuters.com/products_services/science/science_products/scholarly_research_analysis/research_evaluation/journal_citation_reports
3. DICE is a tool built from RESH, but it does not include the two most controversial indicators in RESH: assessment of specialists and mean impact index. DICE does not allow for ranking publications. http://dice.cindoc.csic.es
4. In Recs bases its evaluation on the calculation of a 'Spanish' impact factor, as well as other bibliometric indicators. The aim is to compensate for the lack of coverage of Spanish journals by international citation indexes and, above all, to try to discover the real influence of national journals in the Spanish scientific community. It is developed for social sciences and law. http://ec3.ugr.es/in-recs
5. RESH provides seven different quality indicators to assess publications: permanence, compliance with publication frequency, external peer review, value given by Spanish specialists to each journal, number of Latindex criteria fulfilled, databases which systematically include the publication and mean impact index (a sort of impact factor calculated for Spanish journals with a five-year citation window). The final score allows for a ranking of journals by area. http://resh.cindoc.csic.es

7.3 Project funding and agenda-setting

Introduction

The way in which resources are allocated is central to the organization of national research systems, and the fine-tuning of these mechanisms may offer ways to improve the effectiveness and international competitiveness of these systems. A problem with the analysis of funding systems is that it is often unclear how much of the block grant funding to institutions is allocated to research, infrastructure and salaries. As discussed in Chapter 2, one of the major trends in the public funding of research in most regions of the world is a move away from block funding and towards competitively allocated project funding. This section is mainly restricted to a discussion of the allocation of funding to social scientists in public sector research organizations in OECD countries and China.

An important element of the research assessment exercises discussed in the previous section is peer review. Peer review is also used in the evaluation of research proposals and the allocation of funding. The use of proposal peer review implies certain trade-offs, and the system is facing several challenges at present (Hackett). As was discussed in various contributions to Chapter 2 of the Report, the peer-review process can also have its limitations. Favouritism and a lack of transparency can hamper the openness and fairness which should be basic principles of the review process. In small and developing research systems there may simply be insufficient peers to anonymously evaluate proposals on a variety of specialist topics. In these cases, drawing on the international scientific community or expatriate scientists may offer a solution. For some purposes, the use of carefully devised formulae to allocate resources may be preferred to the peer review process. Arriving at good metric-based formulae would however be difficult, especially in the social sciences. For the top segment of good proposals, neither proposal peer-review nor the bibliometric quality profiles of applicants explains the eventual funding decisions of several European funding agencies (van den Besselaar). Apart from these measures of quality or excellence, these research councils appear to consider other factors in their eventual evaluation decisions, and this is not necessarily a bad thing.

The description of the evolution of the Chinese social science funding allocation system offers an interesting glimpse of how this system currently shares many features of the European and North American funding systems (Wei). Bibliometric indicators are used to inform proposal peer review, but these assessments are based in part on recently compiled Chinese-language bibliographical databases. This again helps overcome some of the limitations of bibliometric evaluations mentioned earlier.

Changes in funding policy and programmes in Canada have allowed an increasingly strong focus on efforts to make social science research more visible to a diversity of publics apart from other social scientists (Provençal). This also has an impact on the evaluation of proposals and research, since other impact indicators than journal citations are required. The experience of the Dutch research council (Nijkamp) suggests that social scientists are responsive to societal needs, even when applying to open calls for fundamental research proposals. Even if it remains important to set thematic priorities as well, in this national case, the questions originating from the scientific community are considered an appropriate guide for research policy in the social sciences.

The contributors to the previous section generally agreed on the need to combine metrics-based quantitative indicators with qualitative reviews. As this section showed, peer review – in some countries supported by metrics-based evaluations – is central to the allocation of resources to researchers and research proposals. It has its limitations and implies certain trade-offs, but it is likely to remain a central feature of both evaluation and resource allocation mechanisms in most research systems in future. This does not mean that the allocation of funding is not subject to constant reappraisal and change. Some types of innovative, multidisciplinary or application-oriented research may be more amenable to other evaluation mechanisms or a combination of different types of evaluation.

Peer review and social science research funding

Edward J. Hackett

Peer review in the social sciences is facing the same choices and challenges as scientific peer review in general. However, the dangers are amplified by the shorter intellectual and institutional histories, and researchers' perpetual obligation to justify and enhance their status within intellectual and policy circles. There are alternatives to peer review for the allocation of research support, but these bring grave technical and institutional liabilities, including lower legitimacy and greater vulnerability to political distortion.

Intellectual advances in the social sciences depend on funding from national research agencies to support data acquisition, analysis, student training and the development of new technologies. Peer review (or, equally, merit review) is the established method for evaluating research and allocating resources. This has led to discussions within the social science community about the merits of peer review.

An appraisal of the peer review system should begin by recognizing that its use in the allocation of research funds is a choice, not a requirement. If peers do not allocate resources for science, then who might do so? There are several alternatives, including legislators, research managers and formulas. When legislators allocate funds the practice is formally known as direct appropriation (and informally as earmarking or pork-barrelling). In the 2008 fiscal year, the US Congress earmarked about $2.25 billion for projects in 920 colleges and universities, continuing a steep upward trend that began in 1996 (Brainerd and Hermes, 2008).

Critics of earmarking complain that it circumvents substantive expertise by ignoring the scientific community's collective wisdom. Earmarking corrodes the meritocratic values of science, stigmatizing recipients and frustrating reviewers, especially when competitive research funding is scarce and sensitivities are high. Supporters argue in response that earmarking enacts principles of representative decision-making (because legislators are elected officials) and distributional or geographic fairness (because legislators are drawn from across the nation). In this view, earmarking offsets the oversights and elitism of meritocratic decision-making.

Alternatively, 'strong managers' might allocate research funds according to their best expert judgement, as is done in the Defense Advanced Research Projects Agency (DARPA). In effect, this represents peer review by a single peer. The manager must be the intellectual and reputational equal of those applying for support. The person must understand the field, including its epistemic culture and membership, and hold clear and widely shared views of its prospects, in order to ensure that decisions and allocations are made in a wise, legitimate and effective manner.

The strong manager is oriented toward and accountable for attaining clearly defined performance outcomes, because in this system procedural accountability is low. This model's effectiveness stems from its ability to support research projects whose objectives are clear, attainable and defined by the funding agency. In contrast, however, much science funding supports research programmes whose purpose is to advance knowledge by selecting between investigator-initiated, opportunistic and open-ended proposals. Strong manager funding can welcome risk but is particularly averse to and impatient with failure, cutting its losses when a promising idea falls short, whereas programme funding would tolerate a revision of scope or purpose.

A third research funding mechanism consists in using formulas to allocate research resources on the basis of seemingly objective criteria: for instance, to states, universities or institutes, and then to centres, teams or individuals within them. Formulas integrate a variety of criteria, including the number of publications, the number of faculty employed, graduate students enrolled or degrees granted, the regional or state population, the level and type of economic activity, or other indicators of past performance, current needs or potential payoff. Nonetheless, fair and effective formulas are difficult to devise, and the relative merits of alternatives are subject to passionate debates:

- How would newcomers fare in such a system?
- How can older researchers who are less productive be eased out, while retaining those who are performing well?
- Would scientists persevere in a recalcitrant line of inquiry, or would they recurrently change course in order to meet performance standards?
- Who would develop and administer the formula, preserving it from efforts to 'game' the system by doing the things that are rewarded, even if they are not most beneficial to science or engineering?

Finally we come to peer review, an institution imbued with practical and symbolic meaning that spans the worlds of science and policy, academia and government, and varied scientific disciplines, and that extends from research into domains of professional practice (in education, engineering and medicine, for example; Chubin and Hackett, 1990). Calling peer review a boundary process highlights the mix of communities, purposes, evidential standards, argumentative procedures, ethical precepts, theoretical frameworks, epistemic cultures, principles of fairness and the like that mingle and collide in the review process (in a way that resembles 'boundary objects' as discussed by Star and Griesemer, 1989). For example, where government might demand accountability, due process and prudence, science might require freedom, agility and boldness.

Positioned across the border between government and academia, proposal peer review is asked to negotiate among competing purposes, doing things that are not always consistent with each other. Among these are evaluating research ideas, providing expert advice (to proposal writers and funding agencies), imparting momentum to a promising line of research, initiating communication among researchers working at the frontiers of knowledge, asserting the professional autonomy of scientists (in relation to other professions), imposing accountability and interposing social considerations into meritocratic evaluations (Hackett and Chubin, 2003). Spanning the border between academe and government, peer review acts as a transducer, changing the form of energy represented by scientific ideas and effort into the form represented by money, reputation and legitimacy. Peer review in the social sciences may entail explicit valuation of the moral qualities of the proposer such as intellectual boldness and perseverance (Lamont, 2009).

The peer review system juggles trade-offs between desirable qualities or values, and changes in external circumstances may shift the balance of emphasis between competing values. The presence and dynamics of competing values in science and other forms of social organization were initially presented in Robert Merton's studies of ambivalence (for example, Merton, 1973 [1963], pp. 383–412) and Thomas Kuhn's (1977 [1957]) 'essential tension' between originality and tradition in science. For Kuhn, research is performed in dynamic tension between inconsistent demands, on the one hand to say something new, and on the other to build upon the existing literature. It is in the nature of science to seek originality while at the same time challenging it, for example through organized scepticism exercised by individual self-criticism and collective peer-review. The nature and implications of value tensions in science, and particularly in the peer review system, have been extensively presented in a series of papers (for example, Hackett and Chubin, 2003; Hackett 1990, 2005).

The following value poles pose particular difficulties for peer reviewers:

- Originality–Continuity: support for new ideas, approaches, and topics while maintaining the scientific field's research traditions and trajectories.
- Selectivity–Sensitivity: exclude unsound ideas, weak designs, fishing expeditions, flyers and fads while remaining receptive to imaginative ideas, novel approaches, and challenges to received knowledge.
- Responsiveness–Rigour: address urgent, emerging research issues while advancing fundamental knowledge and retaining methodological rigour.
- Effectiveness–Efficiency: provide thorough and expert reviews identifying the best research for support while doing so at the lowest cost and least burden to the review community.
- Validity–Reliability: adequately evaluate all aspects of a proposal (which may require a variety of forms of expertise) while achieving a high degree of consensus among reviewers in order for the process to appear reasonable, sound and legitimate.

Three challenges are likely to shift the peer-review system along the value dimensions described above. The first challenge, posed by the US National Science Board (which oversees the National Science Foundation), calls for increased support for research that has the potential to fundamentally transform understanding (National Science Board, 2007). Through this report, the National Science Board echoes longstanding criticisms of the risk-averse character of peer-review (Chubin and Hackett, 1990; Kolata,

2009). In response, the NSF has shifted its peer review system toward a strong manager approach, increasing programme officers' levels of responsibility and discretion. This is accomplished through two substantially new programmes in the USA: EAGER (EArly-concept Grants for Exploratory Research) and Rapid (a programme that supports urgent research), awarding sums of up to $300,000 for periods of up to two years on the recommendation of a programme officer, itself usually based upon internal reviews. In terms of the value poles described above, the tendency is towards originality, sensitivity and responsiveness.

The second challenge arises from the increasingly inter-disciplinary, international and socially engaged nature of scientific research. Since 2000, interdisciplinarity has been on the rise, and it is now accompanied by other forms of hybridization that broaden the scope of research to include diverse nations, cultures, purposes and publics. The crisp lines that separated researchers from their research subjects and from the users of their research have been replaced by collaborations, partnerships and hybrid identities. This emerging mix challenges the peer-review system. Those engaged in processes that transcend boundaries often experience difficulty in achieving mutual understanding, and a variety of linguistic and operational accommodations may be required (Galison, 1997). In analytical terms, the system is shifting towards greater responsiveness, greater concern for efficiency (since available resources to conduct reviews are not increasing proportionately with the complications of doing reviews) and lessened reliability. Reviews will be written from an increasingly varied set of standpoints, with a decrease in agreement between reviewers.

The third challenge that faces peer review is the increasing exhaustion of reviewers. The growing numbers of proposals and manuscripts has increased the number of reviews required to inform decisions, overburdening reviewers and lowering their completion rates. Since reviewers are asked to read a greater number and variety of proposals, completed reviews are shorter, less extensive and perhaps less expert (because the interdisciplinary and intersectoral nature of the proposals draws reviewers into unfamiliar intellectual territory). Accompanying these unfortunate outcomes are increased reviewer curtness, crankiness and willingness to refuse review requests, which, in the terms presented above, contributes to the overall system's lower effectiveness, reliability and validity, and perhaps legitimacy.

Peer review in the social sciences is facing the same choices and challenges as scientific peer review in general. However, the dangers are amplified by the shorter intellectual and institutional histories of the social sciences, as well as their perpetual obligation to justify and enhance their status within intellectual and policy circles. There are alternatives to peer review for the allocation of research support, but these bring grave technical and institutional liabilities, including lower legitimacy and greater vulnerability to political distortion. Emerging challenges – identification and support for transformative research; the increasingly interdisciplinary, international and engaged character of research; and the exhaustion of reviewers in a time of increasing volume, scale and complexity of research – all demand immediate attention. For the social and behavioural sciences, this is both a historical opportunity and a threat that will test available reserves of energy, ingenuity and commitment.

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Research funding as selection

Peter van den Besselaar

Do peer-review scores pertaining to scientific quality and bibliometric performance indicators actually guide funding decisions? One would expect at least a moderate positive association. This, however, hardly occurs. Those selected from the large set of good applications cannot be classified as 'excellent' or the 'best'. What does this imply for research funding systems when there is not enough money to fund all good research?

Research councils are 'in search of scientific excellence'. Although other criteria are important too, such as the societal relevance of research, research councils define their main role as selecting the best proposals and the best researchers through different forms of peer review, past performance assessment and panel reviews. In a case study (van den Besselaar and Leydesdorff, 2007, 2009) we examined the extent to which a social science research council succeeds in selecting the best researchers (for career grants) and research proposals (in an open competition grants scheme). Mission-oriented and thematic programmes were not included. We focused on fundamental research programmes only. Do peer-review scores pertaining to scientific quality and bibliometric performance indicators as defined by this council actually guide funding decisions? We would expect at least a moderate positive association; however, this hardly occurs. Those selected from the large set of good applications cannot be classified as 'excellent' or the 'best'. What does this imply for research funding systems when there is not enough money to fund all good research?

Our study showed that research funding can be considered as a two-step selection mechanism. The research council operates reasonably well at the first step by identifying and discarding the tail-end of the distribution. Researchers with weak past performance[1] and proposals with low referee scores are generally rejected. However at the second step, which involves selection from the top half of the distribution (the group of the good researchers), review scores and past performance measures did not correlate positively with the council's decisions. The successful applicants had a lower average past performance than the equally large group of best unsuccessful applicants. If the past performance indicators and referee scores are combined, there is no difference between the successful and the best unsuccessful applicants. If we accept these quality criteria, it is clear that the council under study does not select the most excellent.

Does this imply that the wrong researchers are funded? That could be too abrupt a conclusion. Since past performances and referee scores do not correlate in this top 50 per cent of applicants, scholarly quality ('excellence') obviously has more dimensions. In other words, it is impossible to create a quality ranking order to select the most excellent from the set of good researchers. As criteria never lead unambiguously to decisions, the council has great autonomy in prioritizing the large set of good applications. Although it is generally claimed that research quality is the dominant factor, it is clearly not enough, and the council's decisions are probably based on other criteria. These can be thematic: what is the research about and how relevant is it for possible applications in economy and society? Criteria relating to academic careers, for example policies to encourage female researchers or researchers from ethnic minorities, can also play a role. In addition, someone's position in the old boys' network may influence decisions. In other words, the selection and funding of research is a multicriteria evaluation procedure, and the idea of selecting 'the best' researchers and proposals is only meaningful if it is interpreted as drawing a line between a large set of good proposals and the rest. Within the group of good researchers and research proposals, talking about 'the best' or 'the excellent' may not be fruitful.

It could, of course, be argued that these findings are specific to the case under study. However, other studies in other countries and fields show comparable results (Bornmann

1. We controlled for age, discipline and type of funding scheme. This does not change the findings.

and Daniel, 2008; Hornborstel et al., 2009; Melin and Danell, 2006), as did a recent study in which we compared the social science council with a life sciences council (Bornmann, Leydesdorff and van den Besselaar, 2010). Consequently, the conclusions may be more generally valid.

Implications

The main issue lies at the systems level. Grant allocations should help the science system work properly despite uncertainties. Trying to improve procedures and statistical indicators for selecting 'the best' individual projects seems a blind alley. This has an important consequence, as project-funding success increasingly influences researchers' careers. If the probability of success is small, we should be aware that rejection does not imply that a researcher and a proposal are not good. Furthermore, while rejection may harm individual researchers, if talent is wasted, the entire research system suffers.

From a science policy perspective, the role of a research council is to improve scientific research more generally. This means:

- supporting talented and innovative researchers
- maximizing the probability of scientific breakthroughs (this is excellent research – but only with hindsight)
- supporting a balanced set of research and programmes – from the fundamental to the application-oriented and from astronomy to philosophy, that is, portfolio management.

Procedures for allocating funds should be discussed in terms of the effectiveness and efficiency of fulfilling these functions at a systems level, by stimulating variation and through properly functioning selection procedures. Does the funding system support the required variation through a variety of funding institutions? Is the best set selected?

One issue needs special attention. If a variety of selection criteria are used, the question of whether these are applied properly and transparently becomes relevant. Even if the procedures support good mainstream research, they do not necessarily support innovation. The complexity of decision-making may shut the system down, preventing new paradigms and new researchers from entering. This suggests the need to assess regularly the potential bias that may have crept into procedures. It may also be useful to introduce competition between funding agencies. This may help avoid nepotism and keep the science system open for a variety of innovative ideas.

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Funding and assessment of humanities and social science research in China

Wei Lili

China has directed increasing attention and funds to humanities and social sciences research since the beginning of the reform and opening-up period in 1978. Management, funding and evaluation systems have consequently been updated, innovated and improved continuously, reflecting the requirements of research development.

In China, the state has attached increasing importance to humanities and social sciences research since the beginning of the reform and opening-up period in 1978. This has led the state to make more money per year available for research. Consequently, the management, funding and evaluation systems have been updated, innovated and improved continuously, reflecting the requirements of research development.

The humanities and social science research project funding system in China

Since the reform and opening-up period, China has had a human and social science research and teaching system comprised of five types of institutions. These institutions are universities, social science academies, government research departments, public administration schools and military research institutions. Four of the five types of institutions are found at national and provincial or local levels; the exception is military research institutions. Nearly 400,000 people are employed in humanities and social science teaching and research nationwide; 30,000 of these are full-time researchers (Chen Kuiyuan, 2009).

The Chinese research funding system mainly comprises projects that fall under the National Social Science Foundation of China, the Humanities and Social Science Research Foundation under the Ministry of Education, and the research projects system of the Chinese Academy of Social Sciences (CASS). These are also the major national institutions engaged in the funding and evaluation of research. The National Social Science Foundation is open to all five types of research institutions. The Humanities and Social Science Research Foundation under the Ministry of Education, also called the Humanities and Social Science Research Project, provides research funding for teachers and researchers in the university system. The CASS research projects system offers funding for thirty-six of its research institutes (or centres) and researchers.[1] The three major Chinese national social science funding agencies follow the principle of assigning equal priority to the humanities and social sciences, and to basic and applied research. In addition, local governments and enterprises fund policy-oriented research, emphasizing local and applied research.

Over the past thirty years, the funding of humanities and social sciences in China has gradually evolved from a single research project funding system to a diversified one. Funding may target research projects, research institutions, discipline development, research teams and individuals, and sometimes publications and journals. The funding and evaluation of research projects is the oldest and most comprehensive instrument.[2]

The project execution management is divided into initiation, interim and concluding stages. Initiation management includes project planning, application, and examination and review by experts as well as examination

1. The National Social Science Foundation of China, the Humanities and Social Science Research Foundation under the Ministry of Education and the CASS research projects system are similar to the National Natural Science Foundation S&T Research Projects under the Ministry of Education and the Project System at the Academy of Sciences.
2. In 2009, the National Social Science Foundation funded 1,720 projects, of which 37 were key projects, 1,006 general projects and 677 young scholar projects. Under general projects, the Humanities and Social Science Research Foundation of the Ministry of Education funds 40 major projects annually, 900 planning projects and 400 young scholar projects. It also funds two projects for each of the 135 key research bases. In addition, it funds 60 completed major projects, key projects and general projects. In the past five years, CASS has annually funded about 30 major projects, 100 key projects, 100 young scholar projects, as well as 100 key research disciplines and 70 academic journals at the CASS level.

of the budget and project approval. The interim stage mainly covers an annual scrutiny, budget management and monitoring. The concluding stage mainly covers the evaluation, the final scrutiny, which includes the holding of seminars, peer reviews (by means of panel meetings or through correspondence), publishing the review results and assigning the predetermined budget in keeping with the grading that the project receives.

Research proposals or results are assessed through peer reviews by experts in the same fields of learning. The assessment can be carried out by means of correspondence or through a panel meeting. In both forms, the review can be carried out anonymously or openly.

The review of a research proposal generally requires four criteria to be met:

- Academic and social value, which includes the originality and social impact of the research.
- The proposal must clearly state and elaborate the methodology, research direction and targeted results.
- The chairperson's prior research results and the potential will be reviewed, as will the research team's knowledge composition. Furthermore, the existence of previous research and results is important, as is the preparation of the materials and other requirements, such as the timeframe.
- The proposal must also include a budget and the schedule should be well planned.

The evaluation of research results has two aspects. The first aspect comprises common quality criteria found in the research community and accepted by scholars in the same field. They include the degree of innovation, maturity and difficulty, the academic values conveyed, and the expected social impacts. The second aspect comprises the targets of the research results and the accepted proposal's expectations as agreed in the contract with the users.

The main characteristics of the system for funding and evaluating humanities and social science research in China are that:

- The determination of research topics is a combination of guided and optional selections. The National Social Science Foundation and the Humanities and Social Science Research Foundation under the Ministry of Education operate as funding agencies to support research, while CASS is a research institution which funds and manages its own research projects. These institutions' research topics largely fall into the two categories of guided and self-initiated research topics. Annually, funding agencies call for research proposals to be submitted, publish research guidelines and allocate project quotas. Following the various research area guidelines, researchers design and propose projects in their fields of expertise. At the same time, self-initiated research topics, which fall beyond the framework of guidelines, are also proposed and reviewed.
- Research proposals and evaluations in the humanities and social sciences are based on a peer-review system. Expert committees or peer-review panels are involved in each step of a research project. The acceptance and conclusion of a research project do not usually depend on the funding agency and management department's evaluation, but on the opinions of experts, expert groups or committees of experts.
- The research project system[3] is the basic way of organizing and managing research in China. The system follows the principle of fair competition to fund good research. Under a given topic, a research team is established as a basic unit to organize and manage the research activities. The chairperson is responsible for the project and has the autonomy to invite researchers to participate, including those beyond their own organization, organize the research, determine the project's pace, ensure the validity of the research arguments and allocate funds.
- The review procedures and administrative regulations are standardized and systematized. This is important, as projects are managed at different levels, depending on the institution that initially established them. The supervising agency, which examines the approval, evaluation and management procedures, applies standardized and systematized rules. These are also applicable to the supervising agency's criteria and management responsibilities and to the research teams' responsibilities, rights and obligations. The regulations and rules are communicated to researchers in the form of a document, which is available online as well as in newspapers.

3. Research project cycles differ for disciplines and project size. Generally, a social science project lasts two years, whereas one for the humanities three to five years. Contracts for financing research disciplines, institutions, scholars and journals usually run for three or five years.

New trends in the funding and evaluation of humanities and social science research projects in China

The debate on how to ensure fair and scientific peer reviews focuses on two questions. The first is how to determine rational and scientific evaluation criteria and indicators. The second concerns the peer-review system's credibility and fairness.

Since the l980s, peer review has been gradually and widely applied in humanities and social science planning, funding, assessment, project conclusions, awards for research results and publication in journals and elsewhere. Since the 1990s, however, the limits of peer review have come to light. Peer reviews' lack of generally accepted criteria and other scientific and non-scientific factors, such as reviewers' expertise, viewpoints, personal preferences and research ethics, have influenced and unsettled the evaluation process. Some peer reviews still exist in their original form, which calls their scientific nature and fairness into question.

With the development of the funding and evaluation of the humanities and social sciences in the twenty-first century, research communities and funding agencies have been contemplating these issues, suggesting new methods of evaluation.

Peer review has established its authority to assess research, and remains the main form and method of assessment in China, even though the practice needs to be improved. Since 2000, the National Social Science Foundation, the Ministry of Education and CASS have adopted a number of measures to improve the system and solve these problems. Thus more experts are now included in the pool of referees. Selection has become more standardized and evaluation is done anonymously. Regulations have been put into place to supervise panel meetings, challenge the system and make the project approval system as well as the evaluation system accountable. In respect of interdisciplinary and multidisciplinary projects, experimental projects or controversial projects on which experts are divided, proposals can be submitted to a special panel of experts in different research fields. Some of the proposals may then be re-examined. These projects' final evaluations may undergo a similar procedure.

A combined qualitative and quantitative evaluation has become the basic mode for assessing research. The introduction of quantitative indicators to the traditional qualitative peer-review process in the late 1990s was a major change in the humanities and social science evaluation. Research communities and their management find this mode more acceptable. To summarize the development of peer review in China, the application of qualitative and quantitative evaluation has experienced three phases. Qualitative evaluation was the only method of peer review before the 1990s. A combined method using different quantitative analyses was adopted in the mid- and late-1990s,[4] and since 2000 the role of peer experts in assessing research has been further strengthened with the introduction and use of new quantitative methods. The roles of the two methods have become clearer, as has the interplay between them. Although the qualitative evaluation of a peer expert is the main method used to assess research, some quantitative indicators are used to supplement this process.

In quantitative evaluation, bibliometric methods are increasingly applied to assess social science research, and were first used in China in the late 1990s. Most Chinese social science journals are not, however, included in the SSCI, because of language and other barriers. In the mid-1990s, a computer-aided bibliometric method was introduced to establish a Chinese social science citation database. The two major databases in China are the Chinese Humanities and Social Sciences Citation Database (CHSSCD), established by CASS's Centre for Documentation and Information, and Nanjing University's Chinese Social Sciences Citation Index (CSSCI). Both are important data sources for the quantitative assessment of humanities and social sciences research (Ji Liang, 2005). They play a crucial role in the bibliometric research of literature, the evaluation of journals, project evaluations, research result awards, the selection of talented researchers, and performance evaluations at research institutions and universities.

4. In view of peer review's problems and flaws, the research community started studying quantitative indicators in the hope of improving qualitative evaluation some years ago. CASS initiated a key project, 'The study and design of indicator systems to evaluate social science research findings', in 1994. Two separate research teams were organized at the Institute of Journalism and the Bureau of Scientific Research Management to study and design indicator-based evaluation systems from different perspectives. In 1998, two evaluation system designs were used to evaluate research results and select CASS's best research results. Since 1999, the National Social Science Foundation has used the evaluation system designed by CASS's Bureau of Scientific Research Management to evaluate its research projects and select excellent research findings. Consequently, when assessing a research project or a research result, peer reviewers must submit their written opinions as well as evaluate the research findings in terms of the evaluation system's indicators. The combination of the two systems provides a final evaluation.

To encourage dedicated and solid research and generate good results, the National Social Science Foundation, the Ministry of Education and CASS have, since 2004, been exploring new measures and patterns to fund research once it is largely or fully completed. This is done to encourage researchers to greater efforts in their scientific and scholarly activities, rather than merely writing proposals for possible funds. The procedures for assessing these projects and approving their funding are similar to those for research proposals.

Currently, the development of humanities and social science research faces a number of new challenges and issues.

The transition from funding single research projects to a more diversified, more transdisciplinary project funding system is continuing. The number of funding types and the forms of research results continue to grow, which calls for a better classification of the funding, evaluation and management systems. We must explore new funding and evaluation methods for different types of project and research results (multidisciplinary projects, or special projects in the same discipline) and gradually establish commonly accepted and type-specific evaluation criteria.

While bibliometric analysis is increasingly applied to assess humanities and social science research, it is sometimes used over-simplistically. Those who oppose bibliometric evaluation question the data sources, analytical methodologies, standardization of citations, coverage of core journals and the role of peer experts, arguing that metrological methods should have a limited role in evaluation. Those in favour are confident that it works well, and encourage its increasing extensive and intensive use in assessing research, although they are also aware of its immaturity.

With international academic cooperation deepening, Chinese scholars and research institutions have developed bilateral and international exchanges and cooperation with other countries and international organizations.[5] With the internationalization of funding and evaluation, there has been a convergence and standardization of evaluation criteria and procedures. However in China, international exchanges and cooperation regarding project management and research evaluation are still in an early stage. We need to explore these issues with colleagues abroad in future.

With the help of computers and the use of information technology, project management comprises no longer merely project registration, recording, analysis and the comprehensive use of research information, but also follow-up management and the integration and reuse of project information and data. Reviewers can be selected from a wider range of experts nationwide, or from a specific region, to avoid internal evaluation and conflicts of interest.

Good academic discipline and ethics have important implications for the quality of research and evaluation. This question involves the researcher as well as the reviewer. During the process of obtaining research funding and assessment, it involves the reviewer especially. Although government departments, educational institutions and research institutions have already put policies and regulations into place to prevent unethical behaviour and to punish it, more scientific, stringent and operational methods for supervising reviewers should be established and continuously improved. In doing so, we can strengthen the ethics of all those concerned.

5. The National Social Science Foundation and the Humanities and Social Science Foundation under the Ministry of Education, for example, encourage Chinese scholars to include foreign scholars in their research projects. CASS also attaches importance to international cooperation. CASS took part in the EU Seventh Framework Programme (FP7) and CO-REACH-SSR, recently launched by China and Europe. The project 'The Study of Sino-Japanese History' sponsored by China and Japan is another example of international cooperation.

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Flash
An overview of Canadian social sciences research and funding

In Canada as elsewhere, increasing attention has been given to how the reach and benefits of social sciences research can be extended beyond academe to more diverse arenas, in the interest of better addressing the problems of complex and changing societies. Consequently, and in keeping with the current climate of accountability for governments and research funding bodies, 'knowledge mobilization' has gained currency and been made a priority. This has been a cause for concern in the social science research community because it raises questions about the role and work of social science scholars and researchers. Furthermore, it can also be interpreted as suggesting a reductive conceptualization of knowledge; it presents uncertainties about how knowledge is 'mobilized', and it raises questions about arbitrary and inaccurate 'impact' measures. These are all justifiable concerns, certainly, and critical engagement with such issues is vital to both the advancement of social science research and sustained academic freedom. The purpose of this short discussion is therefore to provide a context for such a critical engagement. It does so by highlighting the extended reach of social science research as a priority in the policy and programmes of Canada's key funding body for social sciences research, SSHRC, both at present and since SSHRC was established by Act of Parliament in 1977.

From early on, SSHRC identified collaboration and 'knowledge delivery' as key priorities. In its *Proposed Five-Year Plan for the Social Sciences and Humanities Research Council* (SSHRC, 1979), SSHRC identified the limited 'visibility' of social science research results as an 'urgent' problem that needed to be addressed (p. 11). In *Taking the Pulse: Human Sciences Research for the Third Millennium* (SSHRC, 1989), social science research was described as 'invisible' work (p. 4), and there was an identified need for 'knowledge transfer' (p. 2). In *Striking the Balance: A Five-Year Strategy for the Social Sciences and Humanities Research Council of Canada: 1996–2001* (SSHRC, 1996), knowledge transfer between the research community and Canadians was described as a 'particular concern' (p. 16).

In recent years, SSHRC has released key policy documents focusing on the need for 'knowledge mobilization' of social sciences research. These documents include: *From Granting Council to Knowledge Council: Renewing the Social Sciences and Humanities in Canada* (SSHRC, 2004); *Knowledge Council: SSHRC, 2006–2011* (SSHRC, 2005); and *Framing Our Direction* (SSHRC, 2008). In these, SSHRC identifies itself as part of a 'larger system' within a 'new world' with 'new needs' (SSHRC, 2004, p. 7), and describes how its transformation will be one of 'reaching beyond', through 'interactive engagement' across the disciplines and across stakeholder communities in Canada and internationally, as well as through 'maximum knowledge impact'. The latter would be made possible through building a 'greater capacity for understanding research and its applicability' (SSHRC, 2004, p. 10). The need for transformation, SSHRC claims, emanates from the social sciences being caught in 'a paradox of ubiquity and invisibility: present everywhere, but for all intents and purposes, visible almost nowhere' (SSHRC, 2004, p. 12). The strategic plan, *Knowledge Council: SSHRC, 2006–2011*, opens with a section entitled 'Future Knowledge: We know how to shape our future, so what's stopping us?' (SSHRC, 2005, p. 2) and calls for 'systematic interaction between the research community and the rest of society' (SSHRC, 2005, p. 10). In *Framing Our Direction*, SSHRC claims that to meet such challenges, there is a need to move 'beyond the familiar counting of journal articles and books or indicators such as citations' (SSHRC, 2008, p. 12) to an investment in 'knowledge mobilization efforts that realize the potential of social sciences and humanities research for considerable impact beyond the campus' (SSHRC, 2008, p. 13).

Some of SSHRC's current funding programme envelopes are considerable investments in extending the reach and benefits of research beyond academe. Although there are relatively few of such programmes, they are some of the largest in terms of funds. Most notable are the Major Collaborative Research Initiative programme (maximum C$2.5 million per project), which promotes 'the development of active partnership' within and beyond academe to reach 'both traditional and new audiences' (SSHRC, 2009a), and the Community-University Research Alliances programme (maximum C$200,000 annually for up to five years), which describes 'postsecondary institutions and community organizations' as 'equal partners' (SSHRC, 2009b). It is also noteworthy that community organizations are eligible to apply to several funding programmes, and partnership with such organizations is increasingly encouraged in the SSHRC programme descriptions. Further, in 2009, SSHRC began to review its programme architecture, with early, circulated documents suggesting that partnerships both within and beyond academic communities would be more strongly encouraged and supported. Through changes in Canadian funding policy and programmes, there is an increasing and clear focus on efforts to make social science research more visible to a diversity of publics in order to extend the reach of research as a public good.

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Flash
Research policy in a small open economy: the case of the Dutch Research Council

Science plays a major role in our society. Scientific research is also vital to ensure our current and future well-being. We must therefore continue to invest in outstanding talent, expand our knowledge horizons and serve society by producing new insights in order to guarantee the Netherlands a leading position in the global knowledge economy. The Netherlands Organization for Scientific Research (NOSR) aims to achieve this exciting task in partnership with other agencies in the country and around the world.

Netherlands social science research has acquired a prominent international position despite the country's relatively small size. This is the consequence of numerous factors, including strict quality control, dedicated efforts of social scientists and public support.

With a budget of over €500 million, the Netherlands Organization for Scientific Research (NWO) promotes research excellence through highly competitive grants, and takes part in international collaborative projects. Excellence and innovation in research form the main anchor points of NWO's policies for the future of science in the Netherlands. Its mission is to develop and fund world-class research, through partnerships with individual scholars, universities and research institutes, complementary national and international science and research organizations, and society. Universities receive a base funding (first-stream funding), and compete for second-stream funding (competitive project-based public research) through applications via NWO. Although there has been a shift from first- to second-stream research funds, a majority of the funding still goes to universities. University budgets are not always transparent and it is difficult to offer precise data on the levels of research spending. In the social sciences, the distribution between first- and second-stream funding is likely to be in the region of three to one.

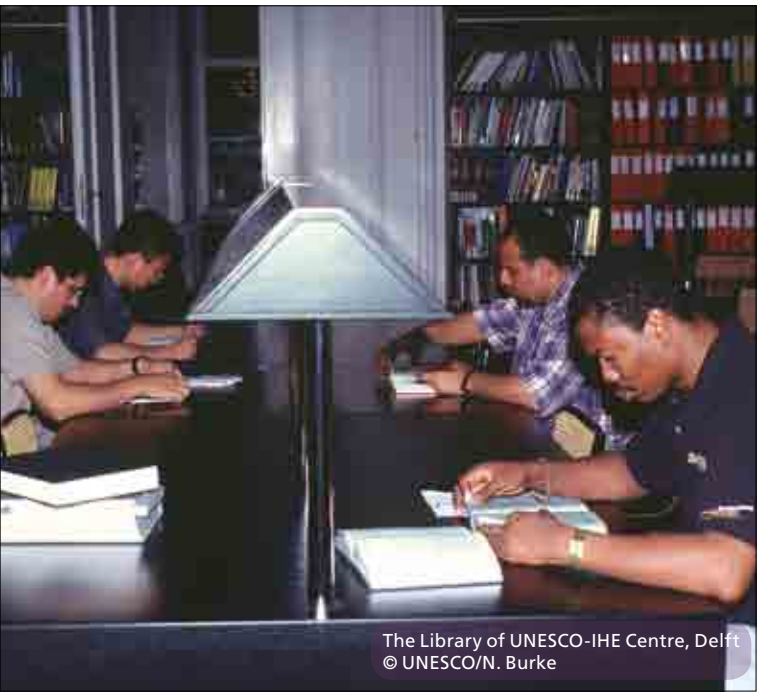
The social science research agenda – including behavioural sciences – is not only a reaction to societal challenges and issues. It also stimulates partial or structural changes in modern societies. Education, learning, knowledge acquisition and use and socio-economic embeddedness are all important parts of an advanced and open knowledge society, in which blue sky, fundamental research is a critical factor for success. There is certainly both the need and the scope for broader social science research funding mechanisms. However, in all cases, independent peer-review systems will be decisive.

The social sciences have certainly gained a respectable position in NWO's funding policy. This is also reflected in the share of funding for social science research proposals, which is above the European average. The percentage of NWO's funding that goes towards the social sciences (excluding the humanities) is 8 to 10 per cent. While data on Europe show significant differences, the Netherlands is above average. The Netherlands' strategic view of social science research funding is centred around three anchor points:

- Sufficient scope for basic research and a high level of freedom for individual scientists, where the only criteria are scholarly excellence and the quality of the proposal. This is a highly competitive scheme, offering a variety of opportunities for both young postdocs and established researchers. The funding goes directly to the researcher, thereby not taking into account the 'fair' allocation of resources between universities. It is clear that any distribution of funds between different fields involves different arbitrary aspects. However, if the percentage scores for researchers are fairly similar over the various domains, there is no reason to worry. This funding scheme existed before the emergence of the European Research Council (ERC).[1] Its subsequent adoption by the ERC may explain (partly at least) the high performance rate of Dutch researchers during the first ERC rounds.
- Critical mass for research initiatives that need a scale that goes beyond the individual scholarly level. This includes dedicated programmes as well as funding opportunities for research infrastructure such as large databases. Here too, each funding is based on quality judgement on a competitive basis. This funding scheme is gaining importance, as social science research is increasingly dependent on costly digital databases.
- Thematic research proposals that seek to address societal challenges. Such thematic approaches are the result of a bottom-up process, characterized by an increase in the interactions with important stakeholders such as ministries. The selection and prioritization of such thematic programmes is based on strict rules of quality, societal needs, international cooperation and scientific potential. The number of selected themes is limited. The final decision is based on both a sense of the urgency of the issues, and the potential outcome of possible investment in a given thematic field.

The success rate for funding applications ranges from 10 to 30 per cent, depending on the type of grant. It is noteworthy

1. The European Research Council (ERC), launched in 2007, is the first European funding body set up to support investigator-driven frontier research. For further information on the ERC, see: http://erc.europa.eu/index.cfm



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that over the years, the allocation of funds for fundamental social science research by domains, resulting from approved proposals, matched reasonably well the ex ante allocation of funds by thematic programmes. This result suggests that prior and posterior priorities do not show a great divergence in the social sciences. This is of critical importance in any demand to policy-makers for extra funding in the social science domain. The articulation of research priorities is certainly necessary, especially in new and emerging fields of research. However, the research community already appears to be responsive to the new challenges that face our contemporary societies: climate change, sustainable development, security, poverty and so on. Science-driven research emerges as a wise anchor point for research policy and by no means leads to esoteric research orientations in the social science field.

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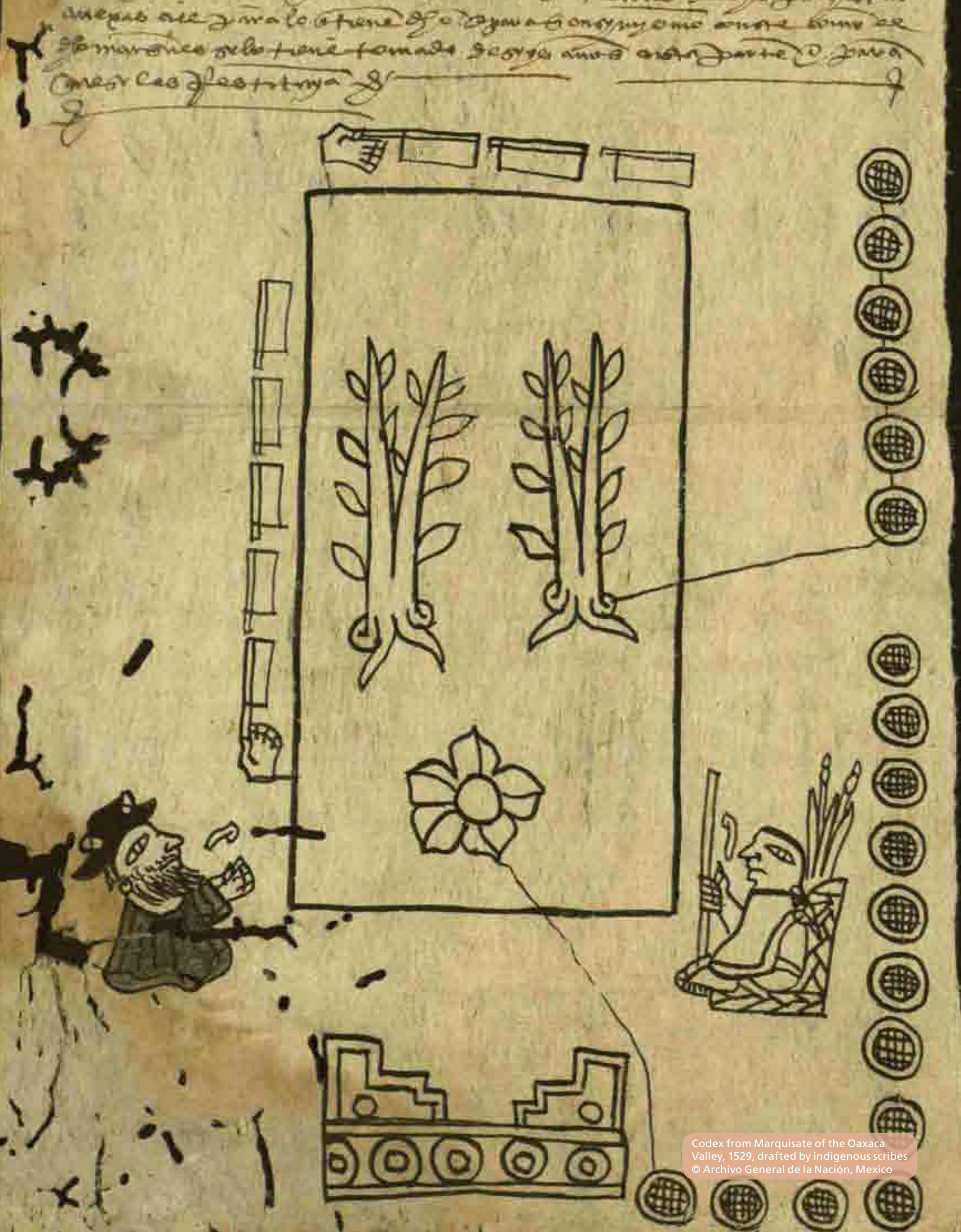

Codex from Marquisate of the Oaxaca Valley, 1529, drafted by indigenous scribes

Chapter 8
Disseminating social sciences

Cutting paper for printing. Anuradapura District. Sri Lanka
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8 Disseminating social sciences

Chapter presentation

The social sciences are present everywhere but visible nowhere. This is the image used by the Canadian Social Sciences and Humanities Research Council in a recent document on the social sciences in society, and it is valid in much of the world.

Nobody doubts the importance of the social sciences. Social scientists are active in different ways in universities, non-governmental organizations (NGOs), political parties, trade unions, firms, government and the media around the world. The demand for social science knowledge is growing. It is used to analyse social change, to feed public debate, to develop responses to specific social issues, and to assist private and public policy-making. Many social science books have led to major debate among intellectuals and opinion leaders.

But despite their key role, doubts are sometimes expressed about the willingness of social scientists to engage in issues of public concern. They are regularly accused of being more interested in conceptual and methodological detail, and of refusing to engage in issues of public interest.

Many professional social scientists are indeed focused on descriptive, explanatory, theoretical, conceptual and methodological tasks. They may have trouble communicating with the larger public. But others disseminate their knowledge actively. They teach to large groups of students, publish the results of their work, and try to spread their ideas through traditional or new media. Some, especially but not exclusively, economists, political scientists and psychologists, act as experts in public debates and on commissions set up by governments. Many engage as critical thinkers in public debates, and this sometimes involves tension with political leaders. The expansion of web technologies has improved the ability of social scientists to make their work and ideas known in wider circles, and many are using these modes abundantly.

In other words, and despite some tendency to believe the opposite, social scientists in many countries do contribute to public debate. As we have seen elsewhere in this volume, an increasing proportion of social science research is conducted outside academic institutions: in consultancy firms, think-tanks, government administration and private research institutes including polling organizations. Many of these institutions aim to influence policy and decision-making and will be discussed in Chapter 9. This chapter targets the links between social sciences and society and the dissemination activities used by social scientists. It analyses the capacity of social science to educate, engage with public issues, and inform public debates.

The chapter first addresses the different public functions of social scientists, prioritizing questions about the transmission of knowledge to the general public and the debates surrounding them (Section 8.1). It reviews the functions that social science Ph.Ds occupy in society, and the extent to which they find positions as professors and researchers, or work as professionals and experts in agencies, administrations and public institutions. In short, it asks to what extent the social sciences are embedded in society and are active in the 'corridors of power'.

Section 8.2 discusses current developments in the diffusion of and access to social science knowledge. The authors discuss the state of the publishing industry, and the increasing role of new technologies. They discuss the growing importance of the web, and the demarcation between those social scientists who have access to the web and those without, and between articles that are openly accessible and those that are not.

8.1 Social sciences, education and society

Introduction

Social scientists have a complex relation with societies. On the one hand, they belong to their societies and are influenced by their evolution. On the other, they observe social developments and contribute to shaping them. These strong multidirectional influences determine the key positions from which social scientists participate in society and in debate: as transmitters of knowledge, as experts, as observers of social phenomena and as critical thinkers (Martinelli).

Educating students is one of the main channels through which social scientists disseminate their ideas and concepts, and imprint their influence on society. In many countries, social sciences are first taught in high schools, as history, geography, civics and social studies. They form part of the education of future and committed citizens, even though paradoxically they are given less importance at school level than the humanities.

At university level, social science splits into autonomous disciplines which attract on average about a third of all higher education students. In other words, large numbers of academics, experts, managers, professionals and leaders have benefited from an education in social sciences, and apply their knowledge and skills in their professional life. The elites that run countries have often been educated in specific departments of social science, and the much larger number of students who have been trained in social sciences can also exert an 'alumni power' (Tarschys and Lachapelle).

The expectations of students in social sciences differ greatly between those who are interested in acquiring professional skills and in understanding the motivations of human behaviour from a social engineering perspective, and those who are eager to acquire methodological and conceptual skills for the analysis of social facts. The range of students' expectations toward the social sciences influences the evolution of different disciplines and gives more weight to some than to others.

Apart from postgraduates, very few students read an author's text in full. Most students read only excerpts reproduced in textbooks or available on the web. A look at textbooks provides a good perspective on the broad social expectations of the social sciences. Their importance in teaching social sciences and in legitimizing specific authors and topics is unquestionable, but we know on the whole relatively little about their conditions of production, their content, their influence and their economic weight. These aspects should be the object of further study.

But are the expectations of social science students met? To a large extent it seems that they are, at least for Ph.D. holders in Organisation for Economic Co-operation and Development (OECD) countries. According to a recent survey of social science Ph.D. holders in twenty-five OECD countries, a sizable proportion of them end up doing research and teaching; and a significant number act as experts in government administrations and agencies, or in businesses in some countries (Auriol). Similar studies conducted in other regions also show that an increasing number of social scientists work outside academic institutions (see for example Gusmão in Chapter 3). In OECD countries a large number of social scientists obtain their Ph.D. later than their colleagues in natural sciences, but their level of unemployment is not higher than that among scientists of all fields. And again, their strong presence in ministries and public administration gives graduate and postgraduate social scientists an extraordinary opportunity to influence public policy (Tarschys and Lachapelle). However it is not possible to say whether the large number of social scientists in 'the corridors of power' actually influences the quality of the decisions made there.

Social science in the public space

Alberto Martinelli

This paper discusses the different primary roles that social scientists play in the public sphere, including the media, universities, lecture halls, coffee houses, and increasingly the internet. Here public opinion is formed and politics is shaped according to the rules of democratic public discourse, through which all views are subjected to others' critical reasoning. To play these roles in a socially responsible way, social scientists must fiercely defend the values and institutions of free science, the critical mind and the open society.

Most social science takes place in the public sphere, and can significantly contribute to public discourse. A possible exception is the kind of social science that adopts idiosyncratic language for an intellectual discussion limited to narrowly defined circles of hyper-specialized insiders, thus limiting its relevance.

Social science can be relevant, and social scientists can play a significant role in the public sphere provided that they:

- produce scientific results by applying a rigorous methodology and developing logically consistent and empirically valid theories
- orm vibrant, sustainable research communities that guard their autonomous judgement and keep themselves at a critical distance from the social issues being studied
- consider social science (like any other science) and political practice as two distinct forms of action.

All social sciences contribute to the public sphere, but since the debate on the meaning of scientific work (knowledge for what and for whom?) is more enduring and lively among sociologists, I concentrate here on sociology, with some reference to international relations. But the issues discussed are relevant for all social sciences.

Debates on the relationships between social research, political practice and public policy, as well as between positive theory and normative theory, have developed throughout the history of sociology, from the forerunners like Saint Simon and Comte, to Weber and Durkheim, from Lynd's *Knowledge for What?* to Lazarsfeld's *The Uses of Sociology*, and to the recent debate opened by Burawoy (2005) in which Calhoun (2005), Wieviorka (2008) and Martinelli (2008), among others, participated.

Burawoy argues that sociologists' public role should be focused on the advocacy of collective movements and on making public sociologists the heroes of a romanticized civil society permanently battling the evils of states and markets. This position – and the example of some scholars' attempts to consider themselves the 'fellow travellers' of a political movement – is unnecessarily restrictive. Social science, like any other science, is not a form of political activism, but a scientific craft constructing a type of knowledge that is simultaneously empirical and critical. Advocacy of collective movements is just one of the different ways in which social science can play a relevant role in the public sphere; I shall address several other roles here.

Educating students

The first relevant role for social science in the public sphere is educating students to develop the knowledge and skills required to become public researchers, experts, officers, managers, professionals, but above all, responsible citizens of open democratic societies, aware of their rights and obligations. This is a major task and is often underestimated in discussions of social science's role in the public sphere. The primary way in which most social scientists can play a key public role is by educating future citizens and future leaders. It is crucial that today's youngsters develop critical faculties, that they learn how to select from and assess the validity of the growing mass of information available, especially on the World Wide Web, and that they acquire the methodological and theoretical skills necessary to interpret and analyse social processes as well as to attribute sense and evaluate individual and collective action. While youngsters comprise the primary audience for the educating endeavour, adults are increasingly included by way of many lifelong education and training programmes.

Constructing key concepts and analytical models, and producing reliable knowledge

A second relevant role for social science is the articulation of key concepts and analytical models for constructing social reality, and for producing the empirically tested findings and cumulating knowledge needed to describe, interpret and develop analyses of social phenomena and combat prejudices. In countries where there are established social science communities, the innovation of sociological concepts and the broadening of sociological knowledge have raised the levels of public debate, decision-making and policy-making on key local, national and global issues. These issues include migration, multiculturalism, global governance, sustainable development, climate change, welfare, security and crime control. Good research undertaken according to high methodological and theoretical standards is required in order to persuade audiences on the basis of scientifically sound arguments and supporting evidence. In this way, social science can provide legitimacy and expertise in the various roles it plays in the public sphere.

Assessing priority issues on the public agenda

Social science's third major contribution to public discourse is to influence which issues are on the public agenda and their priority. The issues to which social scientists draw attention often differ from those regarded as central by decision-makers and the mass media. In non-democratic contexts, scientific opinions can more easily be disregarded or silenced. But even in democratic, advanced industrial societies, the form and content of public life and discourse are increasingly determined by the mass media and politicians. Social scientists who do enter into public debate are less and less capable of controlling how their opinions are transmitted and received.

The format and timing of television programmes, as well as the obsession with advertising, often present the public appearances of so-called experts as caricatures of critical thinking. The public sphere is increasingly insulated from external influences, and is becoming more socially homogeneous and ideologically unified. Politicians and journalists feed off each other, reacting to public issues they themselves have constructed, often through opinion polling (Champagne, 1990). New opportunities are, however, appearing for social scientists to play a more autonomous role in mass communication due to digital media and the growth of virtual communities – communities that are less controlled and more interactive. Social scientists must learn to communicate with larger audiences and with the media, reducing complexities without losing theoretical depth or empirical robustness in order to assist the assessment of issues on the public agenda.

Truth in the face of power

A fourth role for social science is to speak the truth in the face of power. This involves shaping public opinion in democratic polities by clarifying complex issues and their implications for the broader public, unmasking the power relations that underlie and shape social life (Bourdieu and Wacquant, 1992), and critically assessing the policies and ideologies of those in power. Social scientists often produce truths that are inconvenient for those in power, who in turn attempt to suppress research results and silence science. In extreme cases they prosecute, imprison or exile social scientists. In some political contexts, some social scientists practise self-censorship, and certain topics have become taboo: this again threatens freedom of inquiry. International scientific associations must defend the freedom of science and freedom of expression.

Speaking the truth in the face of power and participating in the articulation of the public agenda can serve as a corrective force to the market and the state. The market has come to dominate the institutions and practices of public communication through the commodification of information, opinion and advertising. On the other hand, the state has become increasingly economically interventionist and manipulative of public opinion. Hence the need to restore a democratically legitimate public sphere (Habermas, 1989). Epistemic communities, as key actors of civil society, can develop the public sphere, thus enhancing democratic legitimacy in modern society, at the national and global level (Martinelli, 2003).

Contributing as experts to policy-making and to the governance of complex problems

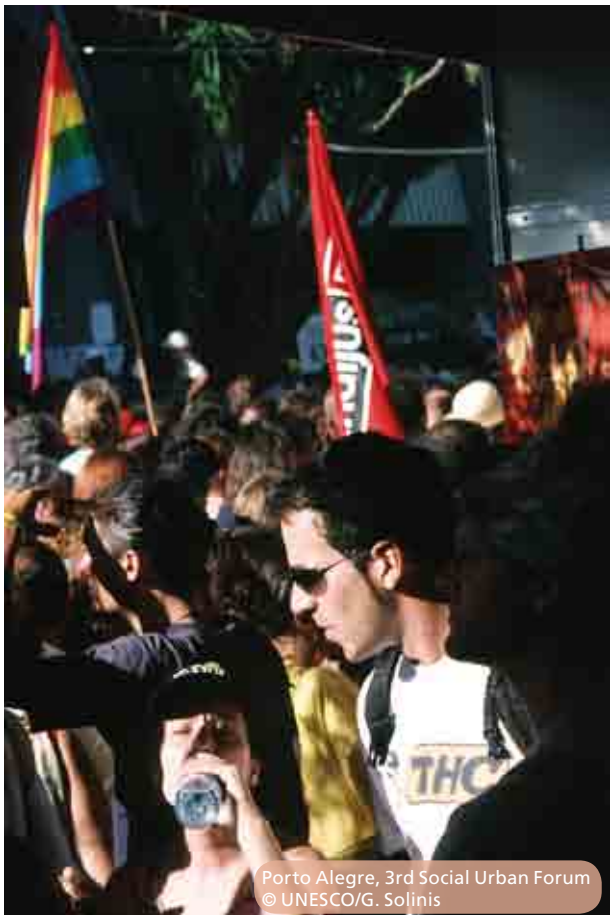
A fifth major role for social scientists is to participate as experts and as members of government, administrations and the media to improve the governance of complex social problems. Here the contribution that sociologists and members of similar epistemic communities can make is particularly relevant. They can do so through independent research institutes, international organizations, NGOs and think-tanks, alongside other civil society actors. Social scientists who do this risk being co-opted onto the state's policy conveyor belt (Smith, 1997) and providing an intellectual after-the-fact justification for government decisions. But social scientists must respond to the need for

evidence-based policy and should be involved in shaping agendas, defining issues, identifying options and choices of action as well as in monitoring impacts and outcomes. However, this should be done from the perspective of semi-detachment and relative disengagement (Wallace, 1996).

Contextualization of social science

The way in which these roles can be successfully performed depends on the way social science knowledge is produced (the concrete, disparate and connected configurations of the division of scientific labour) and on the way in which global social processes are felt within different countries. In other words, we should not discuss these issues in general, abstract terms; the issues and social science too require contextualization. In respect of scientific production, material and symbolic resources as well as superior working conditions (including adequate research funds, tenure, generous sabbaticals that allow for comparative research and contextualization) result in significant differences. Autonomy for academic institutions and guaranteed freedom of scientific investigation, thought and speech are also relevant to the success of social science. They depend on the existence of democratic institutions and a democratic political culture.

Research on the impact of global processes depends upon the country in question's international power and labour positions as well as the coalition of interests in its domestic polity. These affect the choice of research topics, paradigms, concepts and hypotheses. An interesting case in this respect is the legitimizing role that mainstream economics played in constructing the cognitive framework that contributed to the present global financial crisis. At the core of this cognitive framework lies the notion of the self-regulating market, according to which markets are always capable of restoring their equilibrium whenever rigorously exogenous factors or statistically unlikely events create imbalances. This notion – developed in prestigious universities in the USA and elsewhere – provided the intellectual legitimation for deregulation policies, which in turn were fostered by lobbying from a robust coalition of interest groups. The present financial crisis has invalidated the theory of self-regulating global financial markets, which for decades seemed incontestable. This crisis has affected the image of various scientific disciplines and academic institutions concerned in the public sphere.



Porto Alegre, 3rd Social Urban Forum
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In an increasingly complex global public sphere, social scientists continue to play important roles in the analysis of key global agenda issues, and in defining the policy options to deal with them. But to play these roles in a socially responsible way, social scientists must fiercely defend the values and institutions of free science, the critical mind and the open society.

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Social science studies in secondary and higher education

There are very few studies on the extent to which social sciences are taught at the secondary or higher education level outside traditional social science faculties. The boundaries of social sciences taught at different levels, and the disciplines included, also vary.

Social sciences studies at the secondary level

Social science disciplines formally appear in the school curriculum at the secondary level. In practically all OECD countries, social sciences are part of the core curriculum at the lower secondary level. Here they are taught as one integrated subject – such as social studies or social sciences – or are divided into history, geography and civics, or citizenship education. According to an international study that reviewed 200 curricula (Benavot, 2006), social sciences represent an average of 13.3 per cent of the time dedicated to instruction at the lower secondary level. Teaching social sciences at that level usually serves nation-building purposes and fosters citizenship. In the best cases it could also help develop critical thinking, the ability to search for facts and proofs, and the capacity to distinguish the truth and to recognize chronological relationships and patterns.

At the upper secondary level, there is no core curriculum and the topics taught vary with countries, streams, school types (academic, comprehensive, commercial or technical) and, in some cases, between programmes within the same school. In some school systems, such as those in France and francophone African countries, there is a socio-economic stream in addition to the usual humanities, science and technical and vocational streams. Students acquire a basic knowledge of concepts from a variety of social sciences, as well as tools to examine contemporary social, economic and political issues and global challenges with a critical mind. An increasing number of countries offer a variety of options within broadly defined streams, among which are history, geography, social studies, economics, civil rights, business, accountancy and entrepreneurial studies. No study has analysed the objectives and contents of different social science courses. Even within a country many curricula and social science courses coexist, with different objectives, teaching methods and groups of students. Some aim to prepare students to take part in the democratic process and to critically appraise social and economic trends, while others prepare students for problem-solving tasks.

Social sciences at higher education level

At the higher education level, social sciences are taught separately by disciplines. The definition of the disciplines and the boundaries of social sciences vary from one country to another. The only comparable data at international level gives statistics on the number of students in social science, business and law (SSBL), humanities and arts, and education separately. SSBL studies captivate many students. Depending on the country, SSBL students represent between 25 per cent and 50 per cent of the total, with a median proportion of 36 per cent (see Kahn and the statistics in Annex 1 to this Report). This proportion has increased in several countries, including a majority of eastern European countries and China, and has decreased in others (for example, Chile, Brazil, Japan and half of the Western European countries).[1] Several factors may influence these trends:

- students' interest
- easier access to universities
- lower fees
- state priorities reflected in the number of scholarships
- job opportunities
- employers' opinions of SSBL students.

In Kenya, the proportion of students in social sciences and the humanities has increased, mainly because social science departments are less selective than schools of

1. Statistics on the individual disciplines are only available at a national level.

natural sciences, medicine and engineering, and their fees are also lower (Charton and Owuor, 2008). The capacity for social sciences to ensure a smooth transition from school to work seems to have had little impact on the choices made by students and their families in that country. But this is not necessarily true everywhere. Several authors in Chapters 2 and 3 stress the great popularity of economics and business studies, which are considered to lead to more lucrative careers (for instance, in the Arab states and in South Asia). Students attracted by the prospect of a higher salary in their country or abroad enrol in great numbers on business, management, economics and law courses. In China the number of graduates in management studies, law and economics more than doubled between 2002 and 2005 (Pipiya, 2007). The number of history graduates during the same period remained stable at a much lower level. African universities have closed humanities and history departments because of low enrolment levels. This phenomenon can be attributed to slim employment prospects, including low opportunities for consultancy work (see Olukoshi in this Report).

The countries with the largest numbers of SSBL students are the USA, India, China, Japan, Mexico, Brazil and Turkey. The large and increasing number of students in SSBL fuels the demand for doctoral graduates to teach at higher education level.

Social sciences are sometimes taught at the higher education level outside SSBL departments and schools. Medical schools often include social science courses as a means to initiate and prepare students for humane and ethical approaches to their profession (for example, in France and Canada). The status and impact of courses in social sciences outside SSBL departments and schools are difficult to assess. It is increasingly common to argue in favour of more interdisciplinary teaching (for example, Balstad and Piot in this Report), but people in favour of strong disciplinary anchorage are also not rare.

Social sciences in the education of the elite

Law, economics and political science are often part of preparatory courses for future national elites. Social sciences help them understand the tensions and conflicts between groups, and to identify solutions to specific problems in specific contexts. An empirical study of the career trajectories of top executives, politicians, high-ranking civil servants and judges in Germany, France, the UK and the USA shows a significant share of them having a background in social sciences, although in many countries the institution delivering the diploma appears more important than the discipline in which it was achieved (Hartmann, 2006). In the USA, many elite members have studied law or economics, but their status derives from the reputation of the top university they have graduated from. In France, elites are by and large graduates from a Grande Ecole in public administration, business, science or engineering. In the UK, elites are usually graduates from top universities, but perhaps a greater determinant is whether they attended a highly ranked 'public school' (that is, one where fees are paid and which is outside the state system) at the secondary level. Germany, on the contrary, is a country where the title of doctor is of greater importance in determining a status as a member of an elite than the actual discipline or the university where the Ph.D. was obtained. In all the countries studied, the majority of elite positions are held by people from the upper middle class (Hartmann, 2006).

In summary, different conceptions of social science's roles and functions coexist. They are seen as promoting:

- the transmission of a cultural, academic and historical heritage with a view to nation-building, as well as contributing to citizenship (essentially at the secondary level)
- the understanding of social and economic trends, and of their consequences for the well-being of citizens; the understanding of the role of knowledge in the world (at the secondary and higher levels)
- social engineering; in other words providing the necessary skills to perform tasks, and contribute to solving specific social and natural problems
- school to work transition, and providing skills and knowledge that are useful in the labour market
- critical analyses of the functioning of societies, identifying new social phenomena, and contributing to the understanding of individual and group motivations and behaviours
- critical analyses of public policies and government actions.

The attention paid to each of these trends and expectations has been the object of much debate and concern in the past, and will continue to influence the evolution of disciplines (Lussault, 2008).

Social science textbooks in higher education

Studies of social science handbooks and textbooks are relatively rare and tend to be written by historians or education specialists. International studies are often limited to a comparison of the way that conflicts or other cultures are depicted in different countries.

Textbooks and handbooks are important means of legitimizing and transmitting knowledge to new generations of students in the social sciences, and they foster interest in these disciplines in society at large. Textbooks and handbooks are used everywhere, but there are great variations in their symbolic function (Kumar, 1986). In some countries, private publishers release them, while in others only the government publishes them. Many countries import them. In some places, the state recommends some titles; in others it prescribes them. Despite their strategic role in the crystallization of knowledge and in revealing methods, problems, objects, results and schools of thought, contributions to handbooks and textbooks are usually not regarded as genuine contributions to scholarship.

There are very few studies of social science textbooks. Most of the literature on textbooks focuses on primary and secondary education, levels where social sciences are not strongly present. Most existing studies of social science handbooks and textbooks come from historians and education specialists, and are rooted in national and disciplinary outlooks. International comparisons usually limit themselves to considering how conflicts or other cultures are depicted in different countries. Very little is known about textbooks in law, management and most applied social sciences. Conversely, psychology, sociology and economics have international journals in which teaching and education issues, and specifically textbooks at times, are the objects of sustained interest and consideration.

Most of the scientific literature on textbooks is concerned with a critique of their implicit or hidden ideology. Some scholars have looked at the way in which national histories are constructed in history textbooks; others have concerned themselves with the description of sexual behaviours and family relations in psychology and sociology handbooks; yet others have scrutinized representations of poverty (such as Hall, 2000; Clawson, 2002), and of minorities in history, sociology and psychology handbooks. Scholars have looked at the influence of censorship and the political context for the production of social science textbooks and their contents. In sum, the few scholars interested in textbooks and handbooks in social sciences have focused on their own different biases.

Some studies have looked at the emergence of new topics of interest within social science disciplines (such as Winston and Blais, 1996), and have raised concerns about the capacity of handbooks and textbooks to synthesize the identity features of these disciplines. Since social sciences are essentially plural in their approaches and since they provide scope for conflicts between epistemologies and schools of thought, it is important for textbooks to reflect this diversity. That is done at the expense of a clear sense of a discipline's own characteristics. In the case of psychology and economics, their growth and the multiplication of their subfields have weakened their identity (for example, Smyth, 2001 for the epistemological identity of US psychology). Authors have expressed doubts about the capacity of introductory textbooks to agree on a core of common concepts in sociology (Keith and Ender, 2004).

If there are some studies on the reception of textbooks by students, the conditions of their production are not known and research is required. We know little about the condition of the publishing industry for these handbooks and textbooks. Ward in this chapter talks of the growing concentration of educational publishers. But all the processes involved in the production of textbooks, including the selection of authors, the issuing of contracts,

and their writing and evaluation, should be the topic of focused research. The format for disseminating research should also be looked at. For example, are encyclopaedias, thematic dictionaries and companion books by 'star' authors becoming a more widespread editorial form for the diffusion of social science knowledge?

The geography and political economy of the international circulation of social science handbooks, textbooks and other publications should also be considered more carefully. Circulation along former colonial lines or within linguistically homogeneous areas probably reinforces knowledge dependency.

Social scientists in the corridors of power

Daniel Tarschys and Guy Lachapelle

Social scientists have come to influence political and administrative decision-making both as participants and as providers of information. They inform the policy process through educational activities, in which metaphors, concepts and models are passed down. Finally, they influence society through 'alumni power', the application of theoretical fragments and other residues of academic learning to the professional practice of politicians and administrators.

In C. P. Snow's classic novel *Corridors of Power* (1954), a small band of eminent natural scientists close to Whitehall and Westminster is depicted as having a considerable impact on UK government policy on nuclear weapons. What is the role of social scientists in the corridors of power nowadays? Are they similarly influential, and if so, how do they leave their imprint on public decisions?

In order to answer such questions, we must disentangle several threads in the complex relationship between power and knowledge. Social scientists participate in policy-making in a wide range of capacities: as educators, theorists, analysts, journalists, advisers, government officials, ministers, legislators, implementers, evaluators, critics – the list goes on. They deal with both empirical and normative issues, and play a vital role in many of the epistemic communities that shape public policy and assess its results.

In two famous lectures, Max Weber (1919) compared 'the vocation of the politician' to 'the vocation of the scholar'. Aaron Wildavsky (1987) examined the thankless task of academics who were 'speaking truth to power'. In *Three Intellectuals in Politics* (1960), James Joll analysed the difficulties and frustrations confronting 'a man of theory in the world of practice'. Many others have dealt with the divergent demands placed on researchers and politicians, as well as the many adjustments and adaptations required of those seeking to cultivate the borderland between these two domains.

There is an extensive historical and biographical literature on the different relationships between learning and political action at the individual level. Considerable attention has also been paid to the ways in which evolving theoretical paradigms have left their mark on significant turns in public policy. Roosevelt's New Deal, the Beveridge Report, the Woodrow Wilson agenda, the Coleman Report on Education, the War on Poverty and numerous other reforms in welfare provision illustrate this phenomenon.

While some significant cases of policy innovation may be linked to towering individuals or groups of scholars, many trends and waves of reform owe more to the wider expansion of social science education and research in recent decades. The small trickle of social scientists emerging from higher education institutions in the early post-war period has been replaced by large cohorts of university

graduates who now provide the labour market with a broad source of academic expertise. The commanding heights of politics, and various segments of public administration, have been thoroughly affected by this academization of our economies, providing the social sciences with a number of new routes to influence. Successive waves of social science graduates are transforming society by 'the long road through the institutions'. Many are also active in think-tanks, civil society organizations and lobbying organizations.

Despite incessant calls for evidence-based policy-making, most policies continue to be the product of improvisation, intuitive incrementalism, successive modification following unexpected results, and other forms of trial and error. Conscious social experimentation contributes to this process. However, most new initiatives stem from efforts to understand the conditions of policy success and failure in other countries and jurisdictions, and to adapt the lessons learnt to new contexts. Social scientists are heavily involved in this learning process, and have come to influence political and administrative decision-making both as active participants and as providers of reliable information.

Social scientists also inform the policy process through educational activities, in which metaphors, concepts and models are conveyed to new generations of actors. An important channel through which the social sciences influence society is 'alumni power', the application of theoretical fragments and other residues of academic learning to the professional practice of politicians, administrators and others.

Daniel Tarschys and Guy Lachapelle

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Guy Lachapelle is Professor of Political Science at Concordia University in Montréal and the Secretary General of IPSA. His works focus on public policy and comparative policy analysis. He edited with Stéphane Paquin *Mastering Globalization – New Sub-States' Governance and Strategies* (London, Routledge, 2005).

Social science doctorate holders: who are they? Where are they working?

Laudeline Auriol

Until recently, little was known about the employment patterns of doctoral graduates. This is why the OECD, together with the UNESCO Institute for Statistics and Eurostat, has, since 2007, measured the labour market outcome of this highly qualified population. This contribution looks at the characteristics and employment patterns of doctoral graduates from the social sciences.

In 2006, OECD countries delivered some 52,000 doctorates in the social sciences, covering disciplines as diverse as social and behavioural sciences, journalism and information, business and administration, law, and education science and services. This represented around a quarter of the total doctorates awarded in the OECD area. For the second year in a row, more than half (52 per cent) of these advanced research qualifications in social science[1] went to women.

The training of researchers is a long and costly endeavour, which is nevertheless regarded as essential in a knowledge-based and complex economy. Since 2000, doctoral awards have indeed increased at the same pace as, and even slightly more rapidly than, other degree awards. Doctoral graduates are considered the best-qualified to create, implement and disseminate new knowledge and innovation.

The question of the return on investment of such a long education and training is, however, a policy concern. Furthermore, until recently, not much was known about the employment patterns of doctoral graduates. This is why the OECD, together with the UNESCO Institute for Statistics (UIS) and Eurostat, has since 2007 measured the labour market outcome of this highly qualified population in the framework of the Careers of Doctorate Holders (CDH) project (see box).

This contribution looks in more detail at the characteristics and employment patterns of those doctoral graduates specializing in the social sciences.

1. In this paper, as well as in the CDH project, the term 'doctorate' refers to the 1997 International Standard Classification of Education (ISCED-97) level 6, that is, a degree at the second stage of university education equivalent to an advanced research qualification such as a Ph.D.

Age at graduation and main field of specialization

While doctoral awards have steadily increased over the past years (by 40 per cent between 1998 and 2006), those in the social sciences have grown even more rapidly (by 50 per cent) than in the other fields. This growth is partly due to the increased participation of women in doctoral studies. Their number of degrees increased by 75 per cent over the same period.

At what age do doctoral students receive their doctorates? The way higher education and doctoral programmes are organized is quite diverse between countries, and has an impact on the age at graduation and time taken to comlate the doctoral degree. The data collected in the framework of the CDH project shows that the median age at graduation of those receiving their Ph.D. in the social sciences between January 2005 and December 2006 ranges from 29 years old in Lithuania to 41 years in Australia and the Czech Republic. The median age at graduation is higher in the social sciences than in science and engineering. With the exception of Denmark, Latvia, Norway, Slovakia and Sweden, the median age at graduation is lower for women than for men (see Annex 3, Table A1.1).

The fact that the age at graduation is higher in the social sciences may be due to a number of different factors. Fieldwork in the social sciences, as in the humanities, may take longer than laboratory work in the natural sciences or technology. Public funding, fellowships and scholarships are probably more available and substantial in the natural sciences and engineering than in social sciences or the humanities. The CDH data confirm this: a higher percentage of students in natural sciences and engineering benefit from fellowships or scholarships as well as from teaching or research assistantships. Students in social

The Careers of Doctorate Holders project

The Careers of Doctorate Holders (CDH) project is a joint OECD/UNESCO Institute for Statistics/Eurostat effort which aims to better understand the labour market, career paths and mobility of a population regarded as key for the production and diffusion of knowledge and innovation. Particular efforts are devoted to measuring the international mobility of this population.

As part of the project, methodological guidelines, a model questionnaire and templates for output tables were developed with the help of an expert group constituted of statisticians from the participating countries. Due to the methodological challenges involved, notably the constitution of doctorate holder registers, alternative data sources such as censuses, administrative registers or labour force surveys were also used in some countries (such as Australia and Canada) to obtain a limited number of comparable indicators.

A large-scale data collection, conducted in 2007 and processed in 2008, is currently being analysed. Some twenty-five countries participated, and a rich set of data was made available. Most countries were in Europe, including many in central and eastern Europe. Although they showed interest, some of the larger European countries, including France and the UK, did not participate in this voluntary exercise. Among non-European countries, Argentina, Australia and Canada participated. The target population defined in the project is the total number of doctorate holders aged below 70 years, whether they are economically active or not, who are resident in the reporting country. Owing to some quality and comparability limitations, some of the data presented refers to a more restricted section of the population: that is, graduates who received their doctorate between 1990 and 2006. The project's next data-collection round is scheduled to take place in 2010.

More information may be found at http://www.oecd.org/sti/cdh

sciences and the humanities are more dependent on other forms of funding such as occupations, loans, personal savings and family support.

A look at the subjects in which Ph.Ds are awarded puts the natural sciences in first or second place in every country studied by the CDH project (see Annex Figure A8.5). The relative importance of other fields varies between countries. In Austria and Cyprus, social sciences are the first field of specialization, with respectively 36.5 per cent and 30.4 per cent of doctorate holders in these disciplines. The social sciences also account for around 25 per cent of doctoral graduates in Latvia and the USA, and around 20 per cent in Portugal, Slovakia and Spain.

Demographic and labour market characteristics

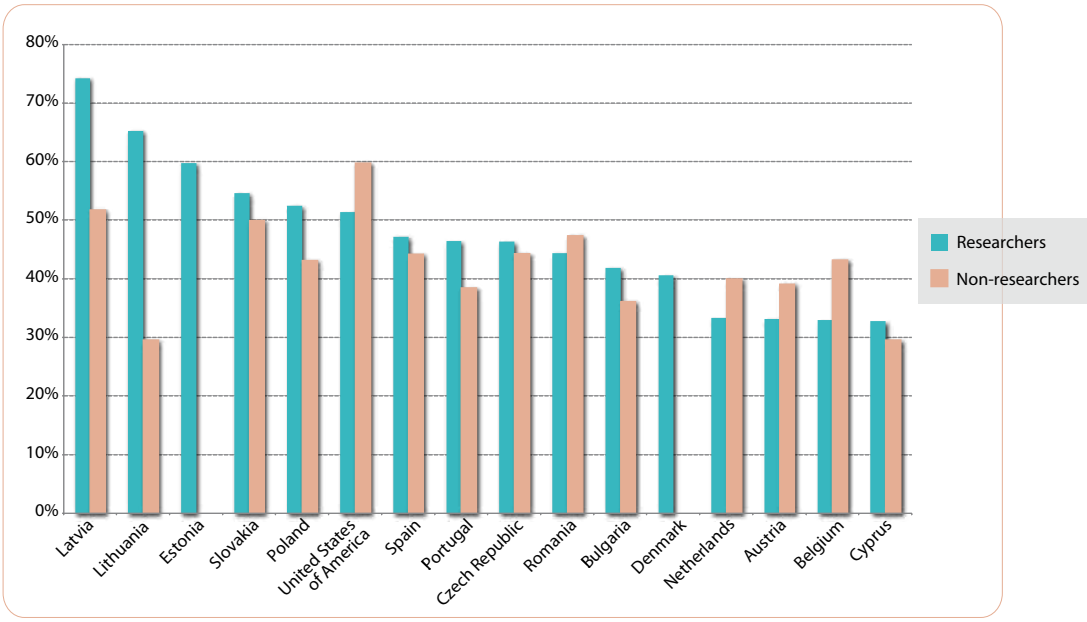
With an ageing population, the ability to replace the ever-growing cohorts of employees who are retiring is an important concern. Owing to their long education and their late arrival in the labour market, the age structure of employed doctorate holders is skewed towards the upper age categories. The data is available for six countries – Australia, Canada, Germany, Finland, Sweden and the USA – and shows that the employed population of doctoral graduates is relatively aged. At least 20 per cent of the employed Ph.Ds aged below 64 in these countries are also 55 or older, and in Canada, Sweden and the USA it is 25 per cent. These percentages are higher than for the whole population of tertiary graduates, and also higher than for the whole population of employed persons. Here only 10 to 15 per cent of the population is aged 55 to 64, except in Sweden, where it is closer to 20 per cent.

At the other end of the age pyramid, the share of employed doctoral graduates below 35 years old is also relatively small. The share of those in the middle-aged classes (that is, 35 to 44 and 45 to 54 years old) is relatively more important than for the whole population of tertiary-level graduates.

Data is not available separately for doctorate holders in the social sciences. It is also difficult to draw any deduction from the overall patterns above, since doctoral graduates in the social sciences obtain their doctorate at an even older age than other doctoral graduates, but social science doctoral degrees are increasing more rapidly than for all other fields, particularly in the light of women's increasing participation.

Another important trend that has affected labour markets in the past decades is indeed the increased participation of women in employment. As was mentioned earlier, the share of women among social science doctoral graduates is growing. Female Ph.Ds in the social sciences have higher participation in employment than those specializing in the science and engineering fields, and participation is increasing with the new cohorts arriving on the labour market. In the Baltic countries, Poland, Slovakia and the

Figure 8.1 — Percentage of women out of 1990–2006 social science doctoral graduates working in research and non-research activities (selected OECD countries), 2006

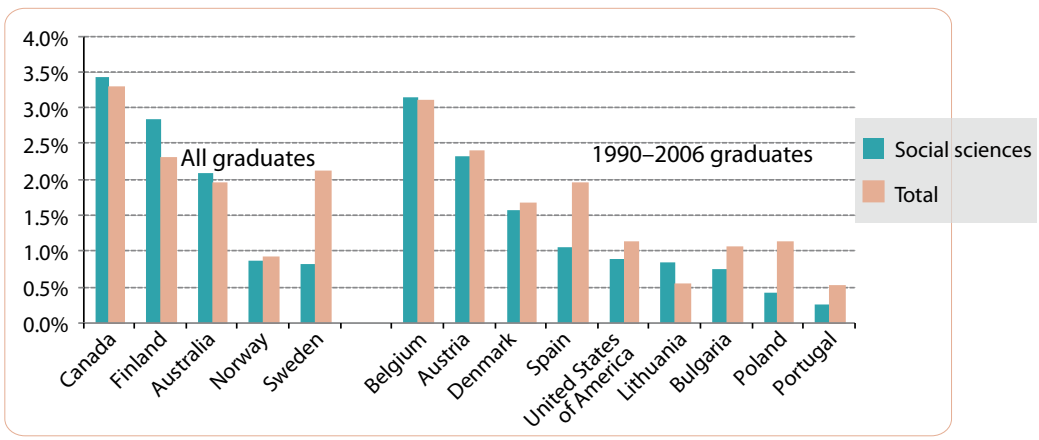


Note: 2005 data for Belgium and the Netherlands; 1987–2005 doctoral graduates and 2005 data for Denmark.
Sources: OECD (2009), OECD/UNESCO-UIS/Eurostat data collection on careers of doctorate holders.

USA, women are the majority of social science doctoral graduates employed. Their participation in research is also higher than in non-research jobs in these countries, except in the USA. Conversely, their participation is higher in non-research jobs in Austria, Belgium, the Netherlands, Romania and the USA (Figure 8.1).

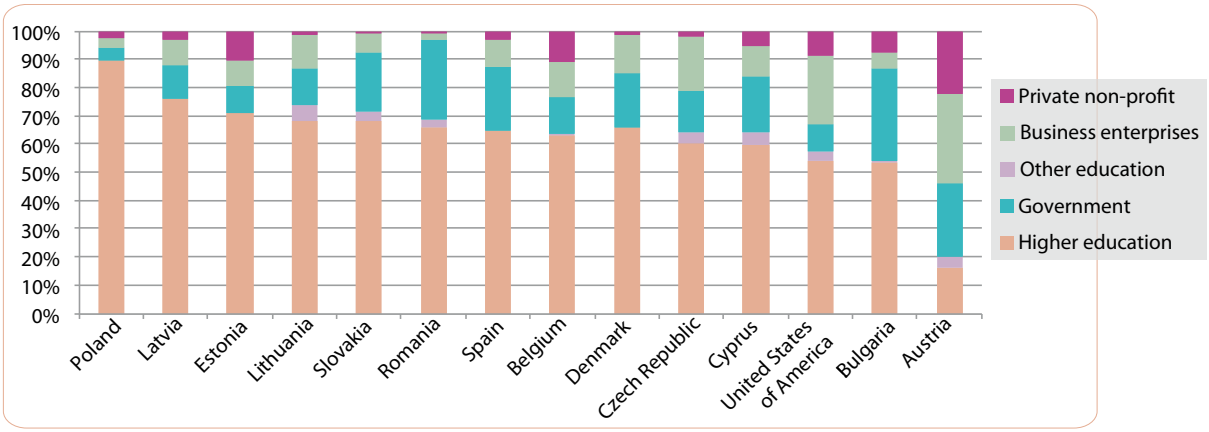
It is important to emphasize that doctoral graduates have better employment prospects than other university and tertiary-level graduates, not to mention those with a lower level of education. Furthermore, in the majority of countries for which data is available, unemployment rates of holders of social science doctorates are lower than for the whole population of doctorate holders. Exceptions are Australia, Belgium, Canada, Finland and Germany (Figure 8.2). But with the exception of some eastern Europe and Baltic countries, the incidence of temporary and part-time employment is not negligible, especially at the start of the career. Part-time employment is also more common among social science doctoral graduates than for 1990–2006 graduates as a whole. Some doctoral graduates may also be employed in occupations for which they are

Figure 8.2 — Unemployment rates of doctoral graduates (selected OECD countries), 2006



Note: 2005 data for Belgium and Norway; 1987–2005 doctoral graduates and 2005 data for Denmark.
Sources: OECD (2009), OECD/UNESCO-UIS/Eurostat data collection on careers of doctorate holders.

Figure 8.3 — Breakdown of 1990–2006 social science doctorate holders by main sector of employment (selected OECD countries), 2006



Note: 2005 data for Belgium; 1987–2005 doctoral graduates and 2005 data for Denmark.
Sources: OECD (2009), OECD/UNESCO-UIS/Eurostat data collection on careers of doctorate holders.

overqualified. In nine countries out of fifteen for which data is available, this is the case for at least 5 per cent of the social science doctoral graduates, and this percentage reaches 14 to 15 per cent in Austria, Germany and Slovakia, and 9 per cent in Denmark. In most cases, however, these percentages remain lower than for the whole population of doctorate holders. Interestingly, too, the social science Ph.Ds' share of managerial occupations is higher than for all doctorate holders in almost all countries.

Employment sectors and occupations

What do doctorate holders do? The majority work in the higher education sector. The government sector is the second main employer of doctorate holders. This pattern is even more marked in the social sciences (Figure 8.3). The only exception among the countries for which data is available is Austria, where the business enterprise and private non-profit sectors employ a larger share of doctorate holders.

It follows that, like the overall population of doctorate holders, an important share of doctoral graduates in the social sciences is employed in teaching occupations (at least 40 per cent) and research (at least 50 per cent). Others work as business and legal professionals (particularly in Austria and Germany, where the occupation patterns differ slightly from the other countries) or as sociologists, psychologists and other social science-related professionals (particularly in Canada, Denmark and the USA). (See Table A8.3 in Annex 3.)

Conclusions

This analysis suggests that in the countries studied, the situation of doctorate holders in the social sciences does not differ much from that of other doctoral graduates, and is if anything more favourable. The number of doctorates in these disciplines is increasing rapidly, and at a higher rate than for all doctorates. The presence of women is increasing, including among those employed.

The employment situation of doctoral graduates is generally better than for less educated people. This may somehow counterbalance the fact that the doctoral population has studied for many years and is relatively aged compared with other tertiary-level graduates and with the entire employed population. The employment prospects of doctorate holders in the social sciences are also relatively favourable by comparison with all doctoral graduates. In two-thirds of the countries, they have lower unemployment rates and fewer of them are in occupations for which they are overqualified. But part-time employment is more common.

A majority of social science doctoral graduates work as researchers, and an important share teach at a higher education level. Other occupations in which they are employed reflect the diversity of the different social science disciplines. Their presence in managerial occupations is also higher than for other doctoral graduates, which is an indication of their influence in society.

Laudeline Auriol

Is OECD administrator and coordinator of the project on Careers of Doctorate Holders. She has more than fifteen years of experience in the field of science and technology indicators, and is the author of articles in specialized or academic journals. The opinions expressed in this paper are her sole responsibility and do not necessarily reflect those of the OECD nor those of its member countries' governments.

8.2 Diffusing and accessing social science knowledge

Introduction

This section deals with the dissemination of social science knowledge through printed publications (monographs and textbooks). It continues by discussing the impact of developments in information and communication technologies (ICT) on the dissemination of social science knowledge in open access journals, as well as the impact of these technologies on the production of social science knowledge.

As was discussed in Chapter 7, most social science fields are experiencing a shift towards journal articles at the expense of monographs, because of the nature of the research evaluation process. Journal subscriptions represent an increasing share of university library spending in a context of decreasing budgets. This has resulted in substantial falls in sales of monographs. Furthermore the major international publishing houses increasingly emphasize sales volume, which leads to an emphasis on books that can be sold worldwide (Ward). In general, research monographs are published less than in previous times and when they are, it is increasingly in English. However, these trends vary widely between countries and disciplines. Textbooks, discussed in more detail in Section 8.1, are another important medium in the diffusion of social science ideas and concepts. The textbook market has also witnessed a considerable process of concentration in recent years.

Developments in ICT are having far-reaching effects on the diffusion and dissemination of social sciences. They offer new ways of collecting, analysing and communicating data, and they facilitate interactions and cooperation between scholars. However, not all researchers have an equal chance to make use of these opportunities as a result of the persistent digital divide between the developed and developing world (Wyatt). The web technologies, of course, play a major role in changing the ways in which social science research is published and disseminated.

Open access approaches are a way of reducing the costs of journal subscriptions and of increasing access to social science knowledge (Perakakis, Taylor and Trachana). The publishers of scientific journals also increasingly allow authors the option of giving open access to their articles. In these cases, as in most open access journals, authors are in charge of covering the publication costs. Open access models in which authors or their institutions pay for the publication can have major negative implications for developing countries and the visibility of their social scientists' work (Wyatt). Authors can also make their publications available free of charge on their website, or in open access repositories – and funding agencies increasingly require this from the scholars they support. According to Perakakis, Taylor and Trachana, this seems to be the most likely direction for future policy on open access, since it increases the number of citations and the access to social science knowledge by the general public and for scholars in developing countries.

An interesting development in this context is the growth of open access journal depositories in the Latin American region. Such portals offer journals the opportunity to increase their visibility (Babini). Like Latin American publications, African academic journals are rarely included in international citation indices. Mouton (in Chapter 2) mentions the African Journals Online (AJOL) initiative, aimed at increasing the international visibility of, and facilitating access to, the research produced in Africa.

Research monographs: an overview

Kevin Ward

This paper analyses recent international trends in the publishing of research monographs in the social sciences. First, it examines changes in the publishing industry in a number of countries. Second, it turns to changes in the performance assessment of some social scientists. Third, it considers some differences in the publishing of research monographs by country and by social science discipline. Finally, the paper summarizes the main trends in the international publishing of research monographs.

This paper analyses recent international trends in the publishing of research monographs in the social sciences, by which we mean single- or multiple-authored 'specialist text[s] aimed at fellow researchers … usually narrow in scope and technically and theoretically sophisticated' (Kitchen and Fuller, 2005, p. 75).

This paper is organized in four sections. First, it examines changes in the publishing industry in a number of countries which are partially behind current trends in the publishing of research monographs. Second, it turns to changes in the performance assessment of some social scientists. These have contributed to new trends in the publishing of research monographs. Third, it considers some differences in the publishing of research monographs by country and by social science discipline. Fourth, and finally, the paper concludes by summarizing the main trends in the international publishing of research monographs.

International trends in the academic publishing industry

Since the 1980s, the publishing of social science research monographs has been transformed dramatically in four ways. The first is the growing business concentration in educational publishing. A small number of international firms now dominate this market, with consequences for the publishing of research monographs. As Thompson (2005, p. 2) puts it:

> *Today a handful of large conglomerates, many operating in an international and increasingly global arena, wield enormous power in the publishing world and harbour a growing number of formerly independent imprints under their corporate umbrellas.*

UK academic publishing – broadly understood to include books for both teaching and research – is dominated by Edward Elgar, Palgrave, Routledge, Sage and Wiley-Blackwell. These firms are also present in the research monographs section of the market, alongside a small number of university presses, such as those of Cambridge and Oxford universities. Across continental Europe these large presses are also important, alongside others such as Kluwer/Springer. In Singapore, these same companies also dominate, besides a series of national presses that publish in one of the national languages. In Canada, however, academic publishing is dominated by three university presses: McGill-Queen's, the University of British Columbia, and the University of Toronto. The largest publishers are present in Canada but they do not dominate as they do elsewhere in the world (Ward et al., 2009). In the USA, while the large international presses are present in the mass publishing section, it is the university presses that are dominant in the publishing of research monographs. Columbia University, Duke University, Harvard University and the University of Chicago presses, amongst others, have a number of social science lists that publish research monographs.

The second significant change is the increasing emphasis by the largest publishers on sales volume. This translates into a preference for the commissioning of collections, companions, readers and textbooks rather than research monographs. In some ways this both reflects and reinforces the teaching of the social sciences. Academics have some say in what gets published and when, for example through their use of reading lists. This leaves it to a shrinking number of publishers to print research monographs.

The third significant change is the extension of the geographic reach demanded by publishers for the books

they commission. It is no longer enough to produce a book of national interest, at least not for the largest international publishing houses. Many publishers look to achieve sales across the world. Not all countries are equal, however, in this search for sales, with the US market often given disproportionate weight.

Fourth, and finally, new technologies have transformed the whole business of writing, submitting, publishing and marketing a research monograph. According to Thompson (2005, p. 85), the 'scholarly [or research] monograph supply chain' has been deeply and profoundly restructured. Technology has also made possible a small but important development in monograph publishing: the academic author is now required to do more and more of the proofing and production work.

Trends in the international working conditions of academics

A growing number of academics are now finding their publishing practices under ever closer scrutiny. More and more countries are introducing systems for evaluating the output of their academic staff. In most cases these exercises share three features (Castree et al., 2006).

First, they emphasize the importance of journal articles over research monographs, which tends to mean the privileging of short- to medium-term intellectual programmes over longer-term ones. Second, to differing degrees, they rely on citation counts through the ISI Web of Knowledge or its rival Scopus to rank the quality of publications. If a journal does not have an ISI number, evidence suggests, academics are often encouraged to publish elsewhere (Ward et al., 2009). If it does have an ISI number, then the higher the impact factor the better. In many countries this has led to a narrowing in the range of journals in which social scientists can usefully publish. There is also evidence that some national governments offer financial incentives to social scientists to publish in particularly high-impact and high-ranking journals, often in the name of 'national competitiveness' (Ward et al., 2009). Third, English has become the international language in and through which academics communicate. This has led some social scientists to argue that their work has been marginalized because of where they write from and the language in which they write (Paasi, 2005).

These trends in the monitoring of academic performance, coupled with transformations in the academic publishing industry, have produced the current context for the publishing of research monographs.

International trends in the publication of research monographs

According to Thompson (2005, p. 94):

> *The decline in the sales of [research] monographs has undoubtedly been one of the most significant trends with which academic publishers have had to deal over the last two decades – more than any other single factor it has transformed the economic conditions of scholarly publishing.*

The first international trend in the publishing of research monographs is the decline in the number of sales per title. In general terms this is the result of the cutting of university library budgets and the growth of other forms of distribution for scholarly works (Pearce, 1998). This has meant that some academics have found it harder to get their research published in monographs. While the details differ from country to country and from discipline to discipline, various commentators have expressed their concern over the declining numbers of monographs being written by social scientists (Ward et al., 2009).

The second international trend in the publishing of research monographs is the growing dominance of the English language. While this English-language-based 'internationality' has not gone unchallenged by a series of non-English-speaking scholars, this trend seems to be irreversible.

The third international trend is the continuing importance of different national languages. English-language research monographs are increasingly the international 'gold standard' for many academics. That said, there remain significant differences from one country to another in the production of English and national-language research monographs. In general, social scientists in France, Germany, Italy and Spain have retained a strong tradition of publishing monographs in their own languages, often as part of the academic promotion process. In Germany, a published habilitation thesis is still obligatory in the pursuit of an academic career. In these countries, research monographs in English tend to be notable exceptions. Danish, Finnish, Norwegian and Swedish social scientists also still publish the bulk of their monographs in their own national languages, and again, English-language research monographs are very much in a minority. In contrast, in the Netherlands, the production of Dutch-language research monographs has slowed, as the emphasis has switched to publishing monographs with the top anglophone academic publishers (Ward et al., 2009).

The fourth international trend in the publishing of research monographs is the continued variety in output between social science disciplines. In some disciplines research monographs are highly valued. Examples include anthropology, archaeology and history – disciplines that value interpretive research and analysis and that, in some countries, lie at the boundary between the humanities and the social sciences. In other disciplines research monographs are valued but are considered less important than journal articles. Examples include human geography, law, politics and sociology (Clemens et al., 1995; Ward et al., 2009). In a third group of social science disciplines, research monographs are not really valued at all. These tend to be disciplines such as economics and psychology that see themselves as being at the interface of the social sciences and the sciences proper, where the publishing of monographs is positively discouraged (Clemens et al., 1995). In these it is multi-authored scientific papers that are understood to have the greatest value, particularly those published in one of a small number of elite journals.

Conclusion

The absence of large international data sets makes this short examination of contemporary monograph publishing necessarily impressionistic. While it is clear that much has changed over the past couple of decades, the impact of those changes on individual academics depends on their discipline and where in the world they work. That all are affected does seem to be irrefutable. Future trends are hard to predict with any certainty, particularly those that transcend very different national publication systems (Hicks, 1999). Nevertheless, it is clear that in a growing number of countries there is less and less scope for academics to publish research monographs, but that the intellectual value attached to them, as judged through promotion cases and reputational capital, remains intact.

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Presentation of World Digital Library, UNESCO Headquarters
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Digitizing social sciences and humanities

Sally Wyatt

ICT is one of the much-heralded technologies of the late twentieth century. This technology has been accompanied by promises to eliminate repetitive, boring and tedious work, and to improve access to information and entertainment, not to mention the quality of social justice and democracy. Yet, despite improvements, inequality in its many forms persists.

Radical developments in science and technology have usually been accompanied by promises to alleviate the problems of the global poor. Whether in terms of food, shelter, health, poverty or safety, the divide between the global North–West and South–East was going to be bridged by nuclear power, the green revolution, advanced transportation technologies, biotechnology and nanotechnology. The reality has nearly always been otherwise, and quite often new divides have emerged or old ones have deepened (Wyatt et al., 2000).

This article focuses on one of the much-heralded technologies of the late twentieth century, namely ICT. This too has been accompanied by promises that it would eliminate repetitive, boring and tedious work, and would improve access to information and entertainment, as well as the quality of social justice and democracy. While there are instances of such improvements, inequality in its many forms persists.[1]

The use of ICT is having far-reaching effects on knowledge production and distribution. Digitization can take many forms, altering established ways of doing research as well as introducing new ones (Jankowski, 2009). For example, questionnaires can now be administered online, facilitating data entry and analysis enormously. In addition, the digital traces many people leave when they travel, conduct their banking online, do their shopping, use their mobile phones or visit a website provide enormous amounts of data for economists and sociologists. Digital material, such as websites, blogs, games and social networking sites, is of great interest to media scholars, anthropologists, cultural historians and many others.

It is not only about new data and new or hybrid methods of data collection and analysis. Digitization also offers scholars many new ways to store, exchange and present data, including dynamic databases, three-dimensional simulations and digital archives. The new communication possibilities offered by social networking sites and other collaborative platforms provide researchers with exciting opportunities to interact with one another as well as with broader audiences (Virtual Knowledge Studio, 2008). These kinds of development have a long history. The humanities have been adapting information technology to research since the 1940s, when scholars began to imagine how computers could assist in developing detailed indices of ancient and religious texts. There is currently a critical mass of scholarly electronic editions of primary sources, facilitating both access to these sources and new kinds of analyses (ACLS, 2006).

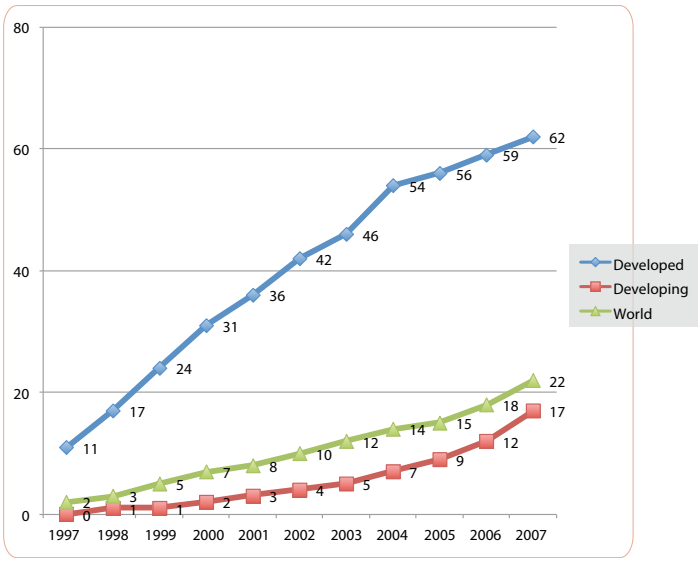
This article focuses on what ICT means for the production of knowledge. Knowledge, and the ability to generate and use it, are necessary prerequisites for individuals, communities and countries to make choices about their social and economic needs and priorities. First the paper draws attention to a major challenge affecting all areas of ICT use, namely the digital divide. It then examines the 'open access' movement. Some of the crucial differences between the social science and humanities on the one hand and the natural sciences on the other are outlined in the final section.

Digital divides: forgotten but not gone

In the mid- to late-1990s, there was much concern about the digital divide within and between countries and regions

1. This article draws on abstracts and presentations made by Wiebe Bijker, Geoffrey Rockwell, Kevin Urama and Shiv Visvanathan at the World Social Science Forum, Bergen, May 2009. Any errors in facts or interpretation are those of the author.

Figure 8.4 — Internet users per 100 inhabitants in developed and developing countries, 1997–2007



Source: ITU (International Telecommunication Union). ICT Statistics.
Available online at: http://www.itu.int/ITU-D/ict/statistics/ict/graphs/internet.jpg (accessed 7 July 2009).

of the world (Cammaerts et al., 2003). As levels of access have risen in industrialized countries, their interest in solving the digital divide has apparently declined. Figure 8.4 presents the number of internet users per 100 inhabitants in developed and developing countries. It clearly illustrates that the global digital divide remains. Even though the gap has narrowed in the early years of the twenty-first century, it is still considerable. These figures also mask major differences within developed and developing countries. For example, some African countries such as Burundi, Congo and Ethiopia have fewer than one internet user per 100 people whereas Morocco has thirty-two. Even within the European Union, there are significant disparities: the Netherlands, Sweden and Denmark have more than eighty internet users per 100 inhabitants, whereas Portugal and Italy have fewer than fifty. This data, compiled by the International Telecommunication Union, is based on nationally reported figures, usually based on surveys. They differ in their methodology, especially in terms of the age of the included users and frequency of use.

Another indicator of internet connectivity is the number of hosts, or computers connected directly to the internet. Table 8.1 lists the number of internet hosts within a country. The difference between the richest and poorest countries is stark, differing by a factor of a billion. These data also illustrate some anomalies. For example, Christmas Island and Tuvalu have more internet hosts per capita than the USA. Some small countries have desirable addresses that are bought by internet service providers; others provide secure havens from financial, copyright or other criminal investigation. Nonetheless, these sorts of data clearly indicate that access to digital resources remains a major problem, and one that is exacerbated in many of the poorer countries of the world by other infrastructural problems with electricity supply and education.

Table 8.1 > Number of internet hosts per million population, 2008

Country	Number per million people	Rank
USA	1,040,073.642	4
Netherlands	659,825.381	8
Canada	154,127.807	44
France	51,581.052	67
Brazil	48,756.614	70
China	10,756.031	94
Nicaragua	10,051.598	96
India	2,358.022	133
Kenya	721.297	152
Somalia	0.105	230
Weighted average	64.545	-

Source: Nationmaster.com (compiled from CIA World Factbooks). Hosts (per capita) by country. Definition, graph and map. Available online at: http://www.nationmaster.com (accessed 1 July 2009).

In terms of knowledge production, however, access is not the only problem. It is also important to consider divides in the production of online content and infrastructure. Unfortunately, data is not available for all countries. Table 8.2 presents two relevant indicators for OECD countries: websites per country and communication technology patents per country. Even amongst the richest countries in the world, there are huge disparities in terms of production of content (websites) and hardware (patents).

Table 8.2 > Producing the internet

Country	Websites, per 1,000 people, 2003, in rank order	Communication technology patents, per million people, 1998–2000 (rank)
Germany	84.7	5.2 (10)
Denmark	71.7	3.8 (12)
Norway	66.4	1.3 (=15)
United Kingdom	64.2	8.7 (7)
USA	63.7	13.1 (5)
Netherlands	48.2	18.0 (4)
Canada	32.9	4.6 (11)
Sweden	28.0	42.0 (2)
Austria	22.6	3.1 (13)
Switzerland	20.5	9.2 (6)
New Zealand	15.3	0.8 (18)
Australia	14.5	2.3 (14)
Finland	13.3	53.5 (1)
Belgium	13.0	7.3 (9)
Italy	12.9	1.O (17)
France	10.5	8.0 (8)
Ireland	5.8	1.3 (=15)
Japan	2.9	23.2 (3)
Weighted average	32.8	11.5

Source: Nationmaster.com (compiled from OECD Communications Outlook, 2003, Tables 5.6 and 3.12), websites by country and Communication technology patents by country. Definition, graph and map. Available online at: http://www.nationmaster.com (accessed 7 July 2009).

Open access: open for what; open to whom?

One of the promises of the internet is that it provides free and easy access to information, which includes not only scholarly articles and books, but also original data. It could be argued that it does not matter where the host or website is based, as long as people all over the world can access data and information. In 2003, many academies, universities, research councils and institutes adopted the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (Berlin Declaration, 2003). In 2009 there were more than 100 signatories, mostly from Europe but also from North and South America. Open access is defined 'as a comprehensive source of human knowledge and cultural heritage that has been approved by the scientific community'. The declaration identifies the internet as the most important tool for making 'original scientific research results, raw data and metadata, source materials, digital representations of pictorial and graphical materials and scholarly multimedia material' freely available. The signatories are committed to finding ways of developing existing legal and financial frameworks to make open access possible.

There are indeed challenges to realizing the objectives of the Berlin Declaration, not least scientific publishers' long-standing practices. Many scientific journals have 'article processing charges', which can be as much as US$5,000. Sometimes there are additional charges simply to submit an article for consideration and for colour printing. For example, the *Journal of Neuroscience* charges authors a $100 submission fee, $850 publication fee plus $1,000 for each colour figure and an optional $2,500 'open access' fee (BioMed Central, 2008). These sums are far beyond the means of many universities. Sometimes fees are automatically waived for authors based in poorer countries, but often exemptions have to be sought on a case-by-case basis. In these instances, 'open access' means that the authors pay instead of, or as well as, the readers. This has consequences for the distribution of knowledge production, with richer disciplines and universities having greater opportunities for publishing their research results. These and other practices (Sismondo, 2009) seriously question the scientific principles of transparency, disinterestedness and peer review.

Social sciences and humanities: how do they differ from the natural sciences?

Charging authors for publication is rare in the social sciences and humanities, not least because such departments are usually less well-funded than their natural science counterparts, even within a single university. However, charging practices can cause problems for those in the social sciences and humanities who study ethical, legal and social issues relating to science and technology and who wish to communicate their results to a natural science audience. There are other important differences between the disciplines. One of the aims of the Berlin Declaration, as mentioned above, is that there should also be greater access to data. Much of this discussion assumes a computational view of what science and research are about. In this view, data is collected and then, in the interests of openness, digitally deposited and preserved so that others can use it to replicate the results and test new hypotheses. But scholars in the interpretative humanities and social sciences work with different kinds of data in which the context of data collection is integral to its interpretation and understanding. Defining species of plants or insects is already difficult; coming to agreement on occupational codes in order to make comparisons about the work people do across time and countries is even more difficult. Making sense of qualitative interview data about, for example, people's understanding of health and illness, collected by someone else, is almost impossible.

Moreover, there are very good reasons why open access to data and data sharing may be resisted, especially by smaller and less powerful researchers and research groups. There are few incentives for sharing data within the research system, and even fewer for doing the hard and time-consuming work needed to ensure that data is compatible and accessible in meaningful ways. The privacy of research subjects and participants may even be compromised by open access to many types of qualitative data (Wouters et al., 2007). Some countries, such as Canada, require researchers to destroy data after five years, precisely in order to protect research participants. This is a different ethical principle from open access, but nonetheless an important one in that it is related to the questions about the life of data and how long it remains open.

There is yet another conundrum relating to open access that particularly affects the knowledge created within the social sciences and humanities. Open access assumes that knowledge is universal, and that anyone can use it once they have access to it. But knowledge is created within local disciplinary, social and cultural contexts. While much natural science and engineering knowledge can and does transcend local boundaries, it is much more difficult for social science and humanities knowledge to do so. Thus, it remains important to question what open access means in practice, in order to ensure that it does not disadvantage those in the social science system who are less powerful in disciplinary, institutional or geopolitical terms.

Finally, it is important to remember that knowledge production in the humanities and social sciences is not always progressive in a temporal sense – the newest is not always the best. The activities and insights of those long dead remain of great interest and importance. Just as agricultural, industrial and informational modes of production coexist in the contemporary world (Castells, 1996–1998), so do different forms of knowledge and knowledge production. Oral, print and digital information and knowledge coexist in practice and as an ideal.

Conclusion

A new knowledge landscape is emerging that increasingly incorporates digital technologies, offering scholars opportunities to collect, combine, represent and exchange data in novel ways. As digitized knowledge comes to dominate Western social science and humanities, researchers in all parts of the world need to understand the possibilities and limitations of the various means of knowledge production, just as they have always done. It remains important to keep the following questions in mind. As new research tools become more widely diffused, what happens to those scholars who do not use them, voluntarily or otherwise? Will they experience difficulties in doing research, at each step of the process, from making grant applications to accessing literature, gathering data and publishing results? Just as the digitization of the everyday world in advanced industrialized countries makes it increasingly difficult for people to organize their financial affairs or travel on public transport, will the digitization of the research process make it more difficult for those scholars who do research differently from what might become the digital norm?

Social science and humanities knowledge is often produced in the context of local needs and situations, which raises particular challenges for its effective digitization and globalization. Fundamental constraints remain to the full democratization of knowledge production across the globe, such as major inequalities in health, education and access to infrastructure. Until these are resolved, the promise of digitization will be no different from the promise of other new and emerging technologies, such as genomics and nanotechnology.

Digitization could easily reinforce old patterns of colonialism in the new knowledge economy in two ways. First, computational methods and approaches developed to meet the needs of research paradigms in the natural sciences and quantitative social sciences may be imposed on the more interpretative social sciences and humanities, with unforeseen and possibly undesirable consequences for knowledge production. Second, the global North and West will not only remain the major consumers and users of knowledge, but also its dominant producers, thus exacerbating an already existing knowledge divide.

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The roads to open access

Pandelis Perakakis, Michael Taylor and Varvara Trachana

Commercial publishers and journal monopolies have radically changed a system originally designed to facilitate the dissemination of academic knowledge, turning it into a profit-seeking business whose financial barriers hinder access to information. While scholars around the world exchange results and ideas in real time and free of charge, their research articles take months or years to be published in an academic journal. And as fewer libraries are able to meet the increasing subscription costs, the work of such authors becomes invisible.

The key features of our current academic publishing system were first elaborated long before the digital era. In the early days, articles published in journals, printed on paper and distributed through postal services, formed the only means of communicating new ideas and research results among scholars. Academics looking for recognition among their peers submitted their articles free of charge to journals. Other scholars, considered to be experts in their fields, volunteered to review and assess the submitted articles. Publishers then assumed the responsibility of distributing the journals back to universities and institutions at a reasonable price.

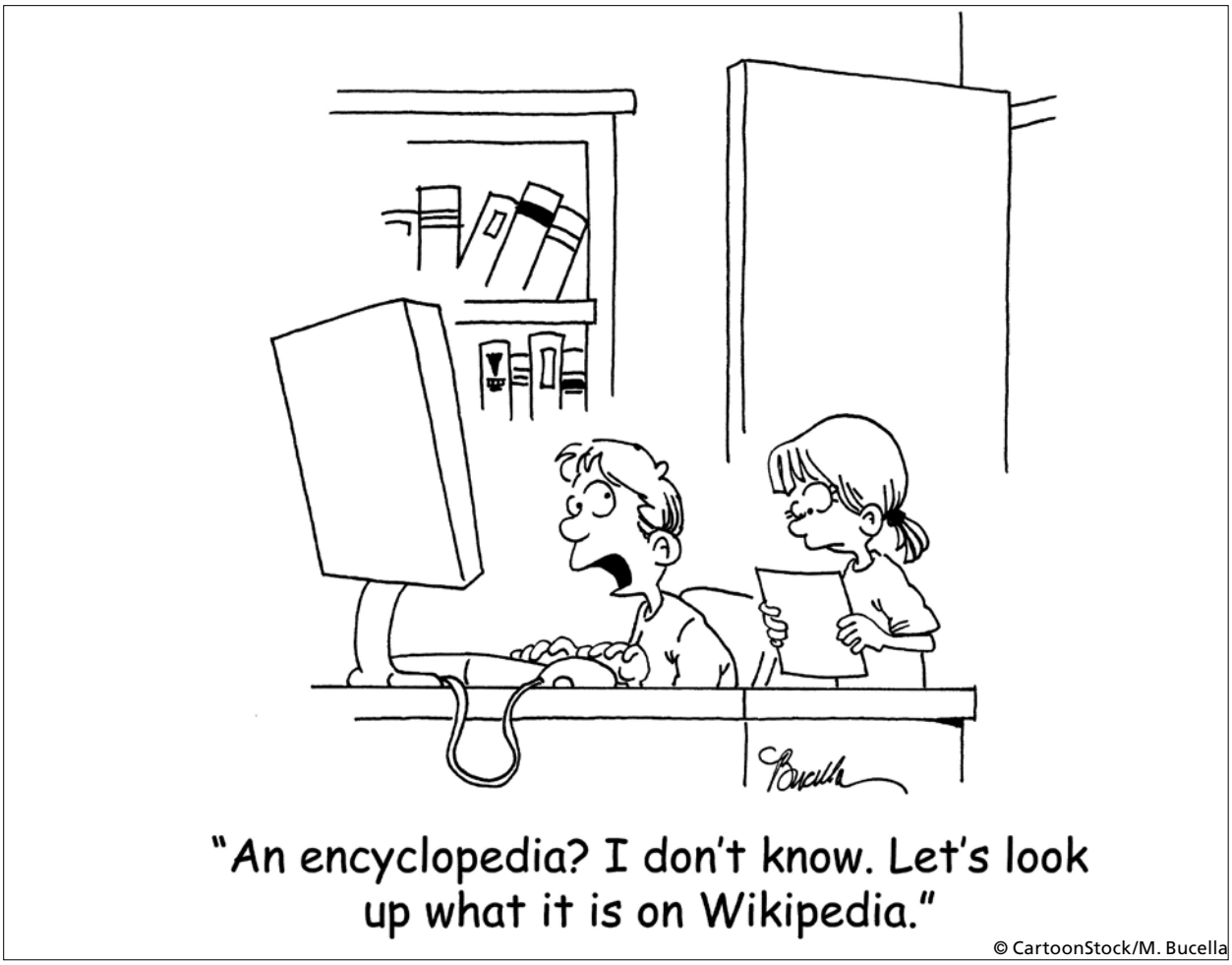
Today's academics, driven by the same desires for impact, prestige, tenure and funding, continue to provide their articles free of charge to publishers. Commercial publishers, however, have dramatically increased journal subscription prices since the late 1970s. According to the Library Journal's *2008 Periodicals Price Survey*, the average cost of journal titles included in Thomson Reuters Social Sciences Citation Index (SSCI) increased in the period 2004–2008 by an average of 37.8 per cent for US titles and 40.9 per cent for non-US titles. Higher subscription costs force libraries to cancel their subscriptions to the least-used or the least cost-effective journals, and to depend more on interlibrary loans in order to provide their users with an adequate access to academic material.

It has become evident that commercial publishers and journal monopolies have radically changed a system that was originally designed to facilitate the dissemination of academic knowledge, turning it into a profit-seeking business whose financial barriers are hindering access to information (Taylor, Perakakis and Trachana, 2008). This is most evident in developing countries, whose progress depends heavily on the assimilation of information (Annan, 2004.) What makes this situation all the more paradoxical is that this is happening at a time when electronic media and the internet have dramatically reduced publishing costs and increased our ability to store and distribute information. While scholars around the world exchange results and ideas in real time, through emails, online chats, web meetings, homepages, institutional webpages and blogs – free of charge – their research articles take months or years to be published in academic journals. And as fewer libraries are able to meet the increasing subscription costs, for the vast majority, the work of such authors becomes invisible.

The open access alternative

This paradox gave birth to a movement led by academics and librarians, and supported by private and public institutes, physicians, patients and the informed public, demanding open, unrestricted and free access to all peer-reviewed scholarly material. The open access (OA) publishing movement's first major international defining statement dates back to the Budapest Open Access Initiative (BOAI). Its statement (Chan et al., 2002) has been signed by 489 organizations and 5,015 individuals.

The movement comprises two main strands. The first, known as the 'golden' road to OA, involves authors submitting directly to an OA journal. OA journals have existed since the late 1980s and come in different forms. Fully OA journals grant free online access to all published material without charging publication fees to authors. Hybrid OA journals charge publication costs, or may charge for an 'OA option' or limit online access to material, and fee-based OA journals provide free OA. However, they often transfer the economic burden to authors through hefty publication fees (McCabe and Snyder, 2004).



At present, the vast majority of OA journals do not charge publication fees. The *Directory of Open Access Journals (DOAJ)* lists 4,117 journals (919 belonging to social sciences) of which 1,485 are searchable at article level. Of all fully OA journals, only 33 per cent charge publication fees (Hooker, 2009). Despite their significant presence in the academic landscape, however, the majority of OA journals are not included in citation indexes such as SSCI and SCI. The exclusion of social science journals from citation indexes makes invisible not only articles, but also the scholars who produce them, their research and their institutions.

Self-archiving

Self-archiving is the second current within the OA movement, and is also known as the 'green' road to OA. Self-archiving involves authors publishing in a traditional (usually non-OA) subscription journal while simultaneously making their articles freely accessible online by placing them on an institutional online repository (IOR) such as the ones maintained by many universities worldwide, or else in a subject-based repository such as arXiv. Self-archiving is not a new idea, and it has been common practice for decades in fields such as computer science and physics.

Scholars in the social sciences and humanities, however, are less familiar with self-archiving practices. Repositories in social sciences trail those of other fields in their rate of both establishment and submission. There are some promising exceptions such as RePEc (Research Papers in Economics), which holds over 631,000 searchable items, and E-LIS (E-prints in Library and Information Science), which hosts more than 9,072 documents. Other repositories in the social sciences however, have not yet gained ground in attracting scholars (Xia, 2007).

Despite the varying levels of awareness within different disciplines, the academic community is gradually realizing that the green road, right now, appears to be a more plausible and viable route to OA. This is reflected in the number of official demands for scholars to self-archive their work. The majority of these demands emanate from research funders such as the National Institute of Health (NIH) in the USA, Research Councils UK (RCUK) and the European Research Council (ERC) in Europe. Harvard and MIT have established similar mandates (Plotkin, 2009). Two potentially influential multi-university mandates have also been proposed: one for all 791 universities in the 46 countries of the European

University Association (EUA) and one for all universities and research institutions in Brazil (Harnad et al., 2008). One significant issue is that at present, copyrights for scholarly articles are held by journals. However this is likely to change, particularly if authors, responding to national, international or institutional mandates, self-archive prior to submission.

Succumbing to pressures from the academic community, a large number of journals have already turned green. In a recent survey of more than 10,000 journals, 90 per cent were found to be green (http://romeo.eprints.org/stats.php). Data from the *DOAJ* also indicates that only 10 per cent of all journals are gold. However, due to the uncertainty regarding the cost-recovery of the golden road, most publishers prefer to give the green light to authors rather than make the transition to OA publishing (Harnad et al., 2008).

Although self-archiving practices are being adopted by a growing number of authors, it has still not become habitual. Evidence suggests that at present, 39 per cent of authors provide OA for at least one of their published articles through self-archiving (Swan and Brown, 2004). The role of librarians in the green road to OA is essential, not only for the establishment and maintenance of repositories, but also to inform authors of self-archiving-compliant formats, copyright procedures, and in particular about the citation advantage offered by self-archiving. A large number of studies have shown that articles freely available online receive a significantly larger number of citations than toll-access articles (Lawrence, 2001). In addition, in developing countries, OA articles tend to be cited more frequently.

A new future

OA is on the rise, and increasing awareness of self-archiving has the potential to lead to 100 per cent availability of all scholarly material. The peer-review process itself may also undergo significant changes. As an increasing number of disciplinary global archives go online, providing free access to full-text articles, web technology such as GPeerReview could potentially broaden the peer-review process and make it more inclusive. We can even imagine a scenario in which both the reviews and reviewers are rated.

In a new era of publishing, OA will make funds available for library spending and librarians will have access to a greater amount of documents. Journals, far from disappearing, could select the most important and prized articles from the vast pool of information provided by subject-based repositories and global archives. Such a scenario would, however, imply a loss of control over access to published research.

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Flash

Open access to social science journals in Latin America

During the 2000s, Latin America has contributed to the development of alternative journal portals intended to improve the visibility of and access to regionally published social science journals.

The relatively poor visibility of regional journals and their authors is often due to budgetary constraints for the distribution of printed journals, and their limited presence in international indexes. These are an incentive for the development of open access (OA). Although they do not yet necessarily have a sustainable business model, a number of Latin American journals have chosen to take up the challenge of online OA as a means of dealing with these problems.

In order to bolster online OA, funding has been channelled principally towards national and regional journal portals rather than individual publishers, while the latter assume a great portion of the costs of journal indexing, platform development and updating, and building bibliometric indicators. A growing number of journals are also using open source journal management and publishing systems (for example Open Journal System, OJS) in order to increase their efficiency on the web, reduce costs and ensure harvesting by journal portals.

Building upon a long history of regional bibliographical information networks[1] and taking advantage of the existence of one common language for most Latin American countries, several regional journal portals have been developed, improving the visibility of and accessibility to social science journals. These developments have also contributed to the provision of much-needed regional scientific indicators (SCIELO and REDALYC), facilitating the evaluation of research.

SCIELO – Scientific Electronic Library Online (www.scielo.org)

SCIELO is a multidisciplinary OA journal portal with 631 full-text journals, of which 79 are in the social and human sciences. The journals are selected by national scientific focal points in 11 Latin American and Caribbean countries as well as in Spain and Portugal. SCIELO was initiated in 1998, and after ten years could boast a monthly average of 1,865,369 full-text downloads of social and human science journals. The SCIELO project, based in BIREME (www.bireme.br), has developed a methodology for the preparation, storage, sharing and evaluation of electronic scientific publications.

REDALYC – Red de Revistas Científicas de América Latina y el Caribe, España y Portugal (www.redalyc.org)

REDALYC is a multidisciplinary open access journal portal with an available collection of 550 peer-reviewed full-text journals, of which 401 are in the social and human sciences. REDALYC offers open access to 79,702 full-text social and human science articles. In 2008, there was an average of 1,445,221 monthly article requests in the social and human sciences.

REDALYC was developed in 2002 through a research programme of the Autonomous State University of Mexico (UAEM). The main objectives were to increase the visibility of and access to Ibero-American journals, to develop regional bibliographical indicators for research evaluation, and to periodically provide analyses of regional socioscientific networks.

CLACSO – Red de Bibliotecas Virtuales de Ciencias Sociales de América Latina y el Caribe (www.biblioteca.clacso.edu.ar)

The CLACSO network of virtual libraries is an open access and cooperative digital library that offers over 11,000 full-text social science publications (books, working documents, journals and papers). The various documents come from CLACSO´s network of 250 social science institutions in 21 Latin American and Caribbean countries. Collections are regularly updated by a working group of CLACSO-affiliated publishers and librarians. This social science portal was established in 1998 to support education, research and policy by improving the visibility of and access to social science research. This regional cooperative digital library functions through an open software Greenstone platform, providing advanced search options and download statistics. In 2008 there was an average of 600,000 text requests per month. CLACSO and REDALYC have signed an agreement to improve the complementarities of both their platforms (REDALYC indexes forty-nine journals from CLACSO´s network) thereby avoiding the duplication of indexing costs.

Latindex – Sistema Regional de Información en Línea para Revistas Científicas de América Latina, el Caribe, España y Portugal (www.latindex.org)

This online regional information system for Latin American, Caribbean, Spanish and Portuguese scholarly journals is

1. Examples: BIREME-OPS (health, www.bireme.br); REDUC (education, http://biblioteca.uahurtado.cl/ujah/reduc/catalogo.htm); CLACSO (social sciences, www.biblioteca.clacso.edu.ar); CLAD-SIARE (public management and policies, www.clad.org.ve/siare/).

grounded in a cooperative network of national scientific organizations that gather and disseminate bibliographical information on regionally produced scientific publications. The Latindex database, which is run by the National Autonomous University in Mexico (UNAM), provides information on approximately 8,609 social science journals. Out of this total, 3,810 profiles include web links to the journal webpage.

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Flash
Challenging the international academic publishing industry

South Africa's higher education is confronted with three major priorities: produce a highly qualified human resource base, train future academics, and produce innovative and high-quality research to enhance the country's competitiveness. These priorities require that scholars and students have access to the latest knowledge available in international academic journals and books. But the profit-making orientation of the international academic publishing industry prevents South Africa and other countries from reaching these goals.

Academic journals are extremely expensive, and most academic libraries have to make painful decisions about subscriptions. The most well-endowed universities manage to get the best of the journals, but the poorest do not. This effectively means that the least well-endowed universities, those that service the poorest students, do not have access to a quality academic journal base and are unable to deliver quality higher education. They do not even have access to all articles produced by South African scholars.

South Africa is starting to address this situation. The Department of Science and Technology commissioned the Academy of Science of South Africa (ASSAF) to search for solutions. ASSAF is considering a set of proposals to support the publication of academic books in and from South Africa, and to develop a cost-effective journal platform to serve as an outlet for the free online dissemination of research results worldwide. The platform is called SCIELO South Africa, and is embedded in the growing multicountry SCIELO system originally created in Brazil. The Academy is also investigating ways to provide cheap access to global knowledge, that is, to the 'international literature' produced in North America and Europe by multinational companies on commercial platforms, as the Brazilian, Chilean and Pakistani governments do. In Brazil, one of its science institutions, CAPES, is mandated with the responsibility of buying access to international journal platforms for most of the public universities with strong postgraduate degree programmes. Pakistan and Chile have a variant of this model which is much cheaper, and which provides public universities with access to a smaller range of journals.

If the goal is to provide all South African universities with broad access to scientific journals, are these measures sufficient? Could more radical measures not be considered, such as challenging the commercial model of academic publishing in North America and Western Europe? Should the government not pass legislation making it mandatory for South African universities to make scientific articles published by their academics available free online within six months to a year of appearing in international journals? Could pressure not be put on publishers to offer better conditions to developing countries and to universities in the Global South? Should inspiration not be taken from the recent wars on drugs prices and against exclusionary clauses on intellectual property, which were won by the combined struggles of civil society and progressive governments of the South?

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Chapter 9
Social sciences and policy-makers

Indonesian puppets
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9 Social sciences and policy-makers

Chapter presentation

Chapter 8 discussed the dissemination of social science to society, and mentioned the role of social scientists as experts and advisers to public or private decision-makers. This chapter focuses on the interface between social science knowledge producers and policy-makers. There are still many disagreements between researchers on the extent to which social scientists should be involved as experts and advise policy-makers, rather than observing social phenomena and limiting themselves to a critical role in society and public policy. Both traditions exist, and they imply quite different epistemological choices. One of the debates concerns whether social scientists have enough reliable evidence to provide sound advice, and whether they can apply an analysis undertaken in a specific context to another context. Researchers also express concern about the way decision-makers and representatives of power make use of the knowledge they produce.

The interface between academic researchers and policy-makers is often marked by tension. In most countries, researchers rely on public funding to finance their research, but claim the right to choose the topics on which they want to work. In a context of shrinking public funds, politicians and decision-makers sometimes question whether the social science research they support is relevant to current public issues, and regret the lack of evidence to inform their policy decisions. In brief, they wonder whether they 'get value for money'. In undemocratic societies the situation is much worse, and there are examples of decision-makers wanting to influence not only the themes on which research is conducted, but also the results.

There is no denying the public engagement and influence of social scientists. The most famous thinkers of the past, such as Smith, Tocqueville, Mill, Marx, Freud, Durkheim, Weber and Keynes, and more recently Arendt, Bourdieu and Sen, to name just a few, have had and still have considerable influence on national and international debates and policies. The question is not whether social scientists influence decisions, but whether researchers work on themes directly related to policy concerns and to what extent; whether they should be financed accordingly; and whether it is justified that their work be assessed on the basis of its impact in the short term.

This chapter starts off by exploring the differences between scientific rationality and the social and political forms of rationality. By means of a few examples, Section 9.1 explores what social science and social scientists can and do achieve, what decision-makers expect, and what they do with the knowledge produced.

In recent years, there has been a growing interest in evidence-based decision-making. Clear and transparent evidence of what works in a specific context, and why, is more likely to influence policy decisions than more general studies. But the production of evidence raises a series of questions. What kind of research is methodologically robust enough to be used with confidence to influence policy? What is socially relevant evidence? These issues are discussed in Section 9.2.

Research is conducted outside the academic world by consultancy firms, non-governmental organizations (NGOs), think-tanks and government agencies. Many of them produce new knowledge or review existing research with a view to informing the decision-making process. Many add to democracy by informing different stakeholders and contributing to clear and better-informed debates. But there are several problems related to these developments, as was discussed in Chapter 3. Think-tanks have developed quickly over recent years. Section 9.3 examines their role in society, and discusses whether a case can be made for conducting similar activities within universities.

9.1 The political use and abuse of social sciences

Introduction

Governments regularly state that they would like to use credible and relevant research results to inform their decisions and to feed their choice of policy options. However, both the culture of government research and the political context influence the degree to which research influences policy. This means that the relationship between research and policy-making is rarely a linear one. In many countries, decision-makers continue to take their decisions on the basis of intuition, ideology, or pressure from different interest groups. They often refer to research only to justify or legitimize their choice. But in democratic societies, research concepts, theories and findings do percolate through informed publics and through the media, and after several years, end up influencing policy debates and decisions. Here research findings influence decisions, but rarely do so immediately.

Researchers themselves have different positions with respect to policy advice. Some adopt a contentious approach, and prefer to act as moral critics of government actions. But many others are eager to work with or for policy-makers. The dialogue with politicians is not easy. Researchers and high-level decision-makers have different time perspectives and different interests. Researchers wish to test a theory, while policy-makers need to obtain solutions. Researchers are also anchored in a specific discipline, while decision-makers require a more interdisciplinary perspective on matters at hand. A strong link between society, policy and science is needed – at least in a democracy. But storing knowledge and ready-made solutions in some kind of repository or clearing house of what works may not be the solution. Instead, a flexible, context-situated social science is needed (Nowotny).

Tedesco and Piot offer their experiences of the difficult interface between researchers and decision-makers. Tedesco makes the point that the relationship between social sciences and policy-making should not be the same in a democracy as in an authoritarian political context. He also regrets being unable, as a minister of education, to obtain answers to concrete problems because of the specialists' inability to move out of their subject-specific concerns. Conversely, Piot illustrates a case where policy-makers did not want to hear what science had to say. AIDS was a good illustration. While several academic sectors and disciplines worked together and reached ground-breaking results, this science was not immediately translated into policies. While the medical solution was available in the shape of antiretroviral therapy, its introduction was slowed down by a policy-maker's denial of the scientific evidence that HIV was responsible for AIDS and by the difficulty of overcoming strong cultural beliefs and widespread malpractice among the population. Strong mobilization by the international community and civil society convinced the decision-maker to take action. Decision-makers exist at all levels, but ultimately people and actors at the grassroots level have to be informed and mobilized.ب

Out of science – out of sync?

Helga Nowotny

Moving out of science means leaving a world of scientific certainties behind only to embrace the messiness of the 'real' world. Or does it? The gulf that seems to separate the specific forms of scientific rationality from social rationalities may be smaller than previously believed. Science and society have become increasingly intertwined. We must be prepared to draw together intellectual and organizational forces in order to find solutions to difficulties that originate in a shared problem.

The orderly world of science vs. the messiness of the 'real' world?

The contrast seems familiar: moving out of science means leaving a world of scientific certainties behind only to embrace the messiness of the 'real' world. But the gulf that seems to separate the specific forms of scientific rationality from social rationalities may be smaller than has been believed. When modern science first became institutionalized in the seventeenth century, it had to be protected from arbitrary interference by religious and political authorities, and was granted relative autonomy. In present-day democracies, citizens call for accountability from all institutions, including scientific organizations. Society has learned to 'speak back to science', and science is well advised to listen. Divisive issues are subject to public debate, and pluralistic societies must strive for a viable consensus. This means that science and society have become increasingly intertwined. Science has become an integral part of society.

Nevertheless, some differences persist between the two. The scientific community has its own ways of working, and typically operates on a long timescale, while electoral cycles impose a short-term horizon on the political world. Policy-makers are often under immediate pressure to take action, and yearn for science to supply them with ready-made solutions, while researchers insist on defining interesting new research questions, and are confident that the results will be beneficial to society.

Yet something dramatically new is occurring. The exuberant faith in planning of the 1960s and 1970s, with its excessively technocratic vision of the future, produced disappointing results, especially from the moment that the social sciences did not deliver on their promises. Most of today's major issues cannot be clearly categorized as belonging to either the natural or the social order. They are the result of complex, mutual interdependencies. Typically they emerge through a process of co-production which privileges neither social nor natural science. Climate change is the latest and perhaps most potent example: a natural phenomenon caused at least partly by anthropogenic intervention in the natural environment. Humanity has reached the planetary limits for numbers and resources, and must confront hard choices: how to discount the future, the cost for future generations, and the price a society is willing to pay in order to decrease carbon emissions. The scales of space and time found in nature need to be reconceptualized in order to accommodate human spans and the human spatial environment.

Another example of co-production comes from the life sciences, which now routinely create novel entities at the molecular level. The understanding of life can no longer be separated from human intervention in the laboratory and has already moved out, as with regenerative medicine, to novel systems for the production, quality control, storage, packaging and distribution of living cells.

Moving out of science may get us out of sync, but the deeper reason for feeling disconnected stems from a co-produced world, in which a growing number of artificially created entities and phenomena belong to both the orderly world of science and the messiness of the social and political order.

Running out of science – can knowledge be stored in advance?

The second part of this section's title refers to the strategies that are necessary in order to cope with living in a co-produced world. Are we running out of scientific knowledge in the face of current complexities? Should knowledge

production be reorganized so as to store knowledge in advance, or to produce it just-in-time, making it readily available when needed?

These aspirations have a familiar ring, echoing the dreams of the Enlightenment. The quest for relevance in the social sciences triumphed during the mid-twentieth century, celebrating planning, social engineering and foresight. Its latest embodiment is the belief in evidence-based policy. Yet, it is often difficult to discern which kind of evidence counts in a given situation, whose evidence is to be used, and for what purpose.

To a certain extent, knowledge can be prepared in advance. It is generally stored in people who need institutions to work in. In order to be usable when needed, knowledge production must take the context of its application into account, combining scientific and technological dimensions with political, regulatory or financial ones. Cultural and normative elements as well as timing play an important role. Processes evolve at different speeds and can become interlocked like an arms race. Will the dynamics of climate change outpace the policy measures that are developed to fight it? Will the institutional, economic and political reform programmes developed to combat the financial and economic crisis work in time?

Being out of sync has to do with urgency and with the different speeds of different actors, from the moment when events start to unfold to the point when policy measures become effective. These are usually situations in which scientific knowledge is uncertain, while passions and interests abound about the actions that need to be taken. The view of a controllable future has been replaced, perhaps irreversibly, by futures that appear more fragile than ever before. And yet the desire to prepare for the unforeseeable persists.

The reorganization of social science knowledge production in the quest to help society be better prepared can only succeed if we acknowledge that most uses of knowledge cannot be foreseen and that contexts matter. Historical circumstances exert their own weight and pull. Otherwise stored knowledge runs the risk of becoming out of date.

The social sciences and their capacity to address policy questions

Acknowledging these limitations does not remove the need to prepare for present and future contingencies. An admittedly superficial look at the capability of social science knowledge to address policy questions shows that it is perceived as reliable and credible when it is based upon scientific consensus. This holds for all scientific knowledge. But the scientific consensus is simultaneously fragile and immensely robust. It is fragile when poked at with a disciplinary knife and when technical details are masked by normative assumptions. Here as elsewhere, the way questions addressed to the scientific community are framed matters. Scientific consensus is also eminently robust when rooted in scientific procedures that subject all knowledge claims to argument, criticism and empirical evidence. The scientific community is heard on policy matters from the moment that it speaks with one voice.

A frequent criticism of social science knowledge is that it is fragmented. This mistakes heterogeneity (a strength) for incoherence (a weakness). Given its research objects, social science knowledge naturally integrates a variety of social perspectives. Likewise, methodological pluralism is not a problem but a necessity, as is a sufficiently wide basis of expertise. The social sciences will continue to make use of new kinds of data, such as those that are now being used in the analysis of social networks. They will continue to 'export' a social science perspective to parts of the natural sciences and to newly emerging interdisciplinary research areas, thereby discovering new, significant points of views as a result of linking concepts with empirical evidence and asking new kinds of question. Social science knowledge will pursue its integration of different perspectives, in particular those that have largely been excluded: the voices from the global South that make up the vast majority of the world's population, and whose aspirations and ways of coping with change must become an integral part of the social science agenda.

Self-reflexivity and the capability to make institutions more self-reflexive are important criteria for the social sciences if they are to be useful in a deeper, non-instrumental sense. Empirical work on policy advice has demonstrated the importance of framing a question or a problem. Instead of looking for relevant social science knowledge as pre-defined, ready-to-use or produced just-in time, it is advisable to see it as emerging in context-specific ways. This renders it loosely coupled to policy, and allows it to cross boundaries and contexts, gaining depth through comparison. If, in addition, it is self-reflexive and capable of inducing self-reflexivity in individuals, groups and institutions, it will enable them to integrate their experience, rendering knowledge more socially robust.

From relevant knowledge to socially robust knowledge

The other route to be followed leads from reliable knowledge to socially robust knowledge. Society increasingly expects

contributions from science, which implies an increasing integration of societal dimensions into the work of scientists. These may be ethical or environmental considerations, or may concern specific future uses for knowledge, even in basic research. This enhances the indispensable reliability of scientific knowledge. Far from being an unwelcome intrusion, socially robust knowledge is capable of better withstanding various tests to which it exposes itself as it affects society, and is better adapted to anticipating societal aspirations and to responding to latent needs. It leaves room for human agency. Participation, especially upstream, creates a sense of ownership and allows a vision of scientific citizens to emerge.

The recent financial and economic crisis has revealed the importance of beliefs, emotions and mental states. Did people really believe that the risk assessment models spawned by 'quants' in order to predict the evolution of financial markets were something akin to predictive truth machines? Economic theories may have been reliable, but by ignoring non-economic motivations and irrationalities, 'the animal spirits', as Keynes called them, turned out not to be socially robust.

Shifting from relevant knowledge to socially robust knowledge includes multiple, even contradictory, perspectives. Institutions serve as important mediators and brokers. Socially robust knowledge includes views of alternative futures and the imagination that shapes them. It crosses the lay–expert divide. As Harry Collins has shown, many people are capable of interacting with experts, without necessarily contributing to their expertise (Collins and Evans, 2007). Interaction with lay individuals sharpens an expert's sense for the context-dependency of his or her claims, and thus promotes mutual respect.

Future directions and forms of engagement

Social scientists may appear to be too eager to offer their advice to policy-makers, or alternatively may seem too distant to engage with public concerns. Following earlier disappointments, social scientists have argued for a more realistic, incremental view of the policy-making process. Decision-making was pictured in the past as a series of arbitrary points on a winding road, mixing strands of bureaucratic, political, economic and cultural interests, not as some ideal of rational decision-making.

At present, interaction with policy-makers takes a more pragmatic form, and a greater desire by the social sciences to engage with society can be observed. Controversies about real or potential risks associated with scientific and technological advance have transformed the relationship between science and society into an important political interface. A learning process has set in within the scientific community, and genuine efforts have been made to move beyond a naïve 'public understanding of science' – whose sole aim is to improve the acceptance of science. Science's greater societal awareness and engagement have highlighted an ongoing public discourse to which the social sciences have contributed. While some social scientists have used action research as their public arena, social studies of science have played an important role in exploring existing tensions between science and democracy in such contested areas as risk assessment and embryonic stem cell research.

Future engagement with policy issues and a greater desire to shape the policy process will very much depend on the social sciences' ability to reposition themselves in a rapidly changing and globalizing world. Engagement is called for in at least three domains.

The first is renewed engagement in the public discourse on innovation. The dominant rhetoric equates innovation solely with scientific and technological innovation, as though it existed in a social vacuum. But in order to respond to latent societal demands, scientific-technological innovations must be taken up and appropriated by society. Social innovations often precede or supplement scientific and technological ones. The rapid diffusion of the internet and its novel uses are a good example, highlighting social innovation in organizations and in everyday practice.

Another engagement arises from the factors that will transform the social sciences in the twenty-first century. Institutionalized during the nineteenth century under the shadow of the nation-state, the social sciences contributed to shaping national identities and establishing new bureaucratic institutions. Now they face globality, with its diversity, its multiple modernities, its many forms of capitalism and its novel scales of time and space. In the past, the overriding question was how social order could be established and maintained under industrialization. Now the overriding question is how a co-produced world, in which the natural and the human-made are intrinsically intertwined, can be shaped under conditions of globality. While the blurred boundaries of market and state are being redrawn, the social sciences are pressed to integrate knowledge and cultural understandings from other parts of the world and to engage in a fresh dialogue with the Other.

A third form of engagement concerns the design of new institutions as a timely response to present challenges and problems. Rapid transformation and turmoil, whether this is caused by the disturbances of financial markets, the

impact of scientific and technological advances, or changes in the cultural sphere, imply the creation of new institutions, capable of accompanying the various experiences that people have and the meanings they create. These institutions must strike a balance between offering space for individual experience and simultaneously offering new forms of collective solidarity.

We must not expect ready-made, just-in-time and ready-to-use knowledge. We must, however, be prepared to draw together intellectual and organizational forces in order to find solutions to difficulties that originate in a shared problem. Public problem spaces must be experimental in spirit, given the inherent uncertainties of the age we live in.

My vision of the form that such a collaborative engagement should take is relatively close to what John Dewey has called for:

> *Reconstruction can be nothing less than the work of developing, of forming, of producing (in the literal sense of that word) the intellectual instrumentalities which will progressively direct inquiry into the deeply and inclusively human – that is to say moral – facts of the present scene and situation.*
>
> (Dewey, 1920; 1948; 1957)

This is as valid now as it was then.

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Flash
The politician and the researchers

A vast amount of literature analyses the links between politicians and academics. These studies highlight the need to identify the historical context of these connections and to delineate the specific areas in which these links can be found, with regard to both politics and social sciences.

In authoritarian political contexts, the social sciences are normally disconnected from government policies. They play the important role of providing the critical thinking necessary for those who oppose dictatorships or tyrannies. Because of its history, which is characterized by long periods of oligarchic, authoritarian or dictatorial regimes, Latin America has a long tradition of a social science sector that is cut off from government policies. The return to democracy changed this situation, creating new opportunities and challenges for social scientists and policy-makers.

It is also necessary to contextualize the interface in terms of policy areas. Economic and health policies have always been more closely linked to scientific theories than other domains. Areas such as education, on the other hand, have been managed on the basis of inputs that did not stem from academic production. The underlying reasons for these differences relate to the evolution of the social sciences, which vary in their ability to generate answers to issues that are faced by governments. An OECD study which compares education and health highlights this phenomenon clearly (OECD, 2000).

Following these general ideas I wish to refer specifically to the interface between policy and the social sciences in the field of education policies, on the basis of my own experience as minister of education of Argentina.

On the important issue of education management, the social sciences provide contradictory answers which often reflect researchers' own personal views and interests. This is apparent in connection with issues related to educational administration as well as to matters that are specifically related to pedagogy. The weakness of the answers that are provided generates doubts among decision-makers. These doubts can only be resolved through a high level of political risk-taking.

A useful anecdote can help to illustrate this situation. During a meeting with the team in charge of policies related to information technology, I was presented with the idea of launching a set of pilot projects whose ambition was to test the efficiency of three new technological devices that had been recently designed by companies working in this field. The specialists gave explanations on the potential of these devices, much of which was related to their speed of transmission, size, image quality and the interactivity of messages. At the end of the presentation I asked the following question: among the problems that we currently face in education, which are the ones that could be resolved through these technological devices? The question produced confusion among the specialists, who were used to reasoning about technology, not the problems that policy-makers are faced with. Similar situations occurred in other contexts, particularly with regard to teacher training. Specialists have a tendency to teach what they know rather than what teachers need to know.

This situation has produced disappointment over science's potential contribution to the definition and implementation of public policies. In this regard, we only have to recall a discussion between George Steiner and Cécile Ladjali (2003) to appreciate the extent to which trust in these disciplines has deteriorated, not only among politicians but among intellectuals as well. As Steiner explains, 'Goethe says that "the one who knows how to do does. The one who does not know how to do teaches."[1] And I [Steiner] add that: the one who does not know how to teach writes teaching manuals' (Steiner and Ladjali, 2003, p. 93).

Secondly, a minister of education faces challenges that are related to the process of change which is at the heart of political action. In the case of education, decision-makers know that one of the fundamental problems relates to changes in the attitudes and representations of those who are the main actors in the educational process, including teachers, supervisors, administrators, principals, students and their families. In Foucault's terms, we no longer govern populations in order to govern subjects. The management of public opinion and communication issues has become as important as the policy content. In terms of both diagnosis and policy design, contributions from the social sciences fall short of the problems that face us. This space is currently occupied by surveys of public opinion and marketing experts, as well as image consultants, who prepare their reports and recommendations with little scientific rigour.

Thirdly, I wish to mention one area in which the social sciences have traditionally provided important policy inputs: problem identification or diagnosis, and prospective analysis. With regard to diagnosis, it is necessary for social scientists to identify both the problems and the factors that may contribute to resolving them. The identification of prospective solutions becomes simpler from the moment that politicians accept a certain level of uncertainty. Conversely, academics must also assume greater political commitment when it comes to prospective analysis, knowing that

1. This is in fact a citation of George Bernard Shaw in his play Man and Superman, 1903. "He who can, does; he who cannot, teaches."

there are no technological determinisms but only socially constructed destinies.

As a general conclusion, it is possible to say that education policies need the social sciences in order to achieve greater rationality and efficiency in their formulation, as well as to facilitate the monitoring and social control of their development. However the opposite is also true: social scientists have to articulate their activities with those of policy-makers, since the management sphere is also a sphere of knowledge production. Better articulation would enable the social sciences to achieve higher levels of relevance and validity.

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Job-seekers, Brazil
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What social science can provide for policy-makers: the case of AIDS

Peter Piot

Social science research is a key means to help unravel sexual and addictive behaviours in different contexts, foster a better understanding of the structural drivers impacting on the AIDS response, and provide analytical tools for policy decisions and political leadership.

We need to translate innovative ideas – technological and in the social sciences – into actual practices that benefit people much faster than we do today.

Because of its complex character, AIDS forms an almost perfect case study of the ways in which several sectors and disciplines can work together and reach ground-breaking results. It also shows us the ways in which science can or cannot be translated into policies.

A disease that was unheard of less than 30 years ago is now a leading cause of death in Africa. Every day approximately 6,000 people die of AIDS throughout the world. Since the beginning of the twenty-first century, over 4 million people in low- and middle-income countries have been able to benefit from antiretroviral therapy through concerted global action, as compared to only a few hundred thousand five years ago. Even though the AIDS epidemic is far from over, nowadays fewer people die of AIDS and fewer people are infected by the virus (UNAIDS, 2008). This development arose from a unique synergy between science (medical and social), politics and finance. Few people expected the extraordinary results that this synergy would produce.

The main scientific breakthrough was the discovery of antiretroviral drugs capable of treating HIV infections. Through lifelong treatment, AIDS was no longer deadly. Shortly after the announcement in 1996 that HIV could be treated, drugs became widely available in high-income countries and mortality rates dropped significantly. The reality and the perception of AIDS changed radically as well. But as long as the price of treatment remained high ($14,000 per person per year in 1996), this breakthrough was limited to a minority of HIV-infected individuals. An unprecedented level of global mobilization was necessary to ensure that antiretroviral drugs were easily accessible to all, especially in the developing world.

The politics of AIDS

What made the difference was political action. With a few notable exceptions, such as Brazil, Thailand, Uganda and Senegal, there were relatively few early signs of political leadership on AIDS. At the turn of the new millennium there was an increase in the political momentum on the issue, eventually culminating in the UN General Assembly Special Session on HIV/AIDS in June 2001, in which Member States agreed on a roadmap to defeat the epidemic – the Declaration of Commitment on HIV/AIDS (2001).

This new political momentum was the result of several congruent processes. The first is civil society activism, particularly by those with HIV. A potent example of activism is the Treatment Action Campaign (TAC) in South Africa, which grew rapidly to become a mass movement in a country in which over 5 million people are infected with the virus. Through political and legal action, TAC won a series of major victories over the South African Government, which now runs the world's largest antiretroviral treatment programme (De Waal, 2006).

In a parallel move, AIDS activists in North America and Europe campaigned for the implementation of a multi-lateral funding mechanism to fight AIDS, the Global Fund to Fight AIDS, Tuberculosis and Malaria.

A variety of activist groups came together to form a global movement. Along with environmental groups, AIDS activists are a prime example of a new form of transnational civil society activism: an informal, horizontal network that makes extensive use of modern communications

technologies. Activists also use the knowledge that is generated by both the natural sciences (particularly biomedical science) and the social sciences.

A second process that contributed to develop the global momentum on AIDS was the emergence of a 'brilliant coalition' (Hochschild, 2005). AIDS produced unlikely bed-fellows. In South Africa, for instance, an alliance brought together AIDS activists, Anglican bishops, scientists, trade unionists, communists and the Chamber of Mines.

A third important process was the repositioning of AIDS from being a medical curiosity to a global health problem with profound implications for development, human rights and human security. AIDS became a hot topic for finance ministers, the UN Human Rights Council and the UN Security Council, which organized a historic session on AIDS in Africa in 2000.

A fourth factor was the decline in the price of antiretroviral drugs. Politicians now felt that they could support a feasible solution to the AIDS problem with quantifiable results in terms of the lives that could be saved. An added bonus for some was that they no longer had to deal with sensitive issues such as sex, drugs, homosexuality or gender inequality.

In 2001, a series of global and regional political events brought these various issues together. The Nigerian President Obasanjo hosted a Special OAU Summit on AIDS, breaking years of silence by African leaders on the subject. During this summit, Kofi Annan made his historic call for a war chest of US$7 billion per year to fight AIDS. Two months later the UN General Assembly held its historic Special Session on HIV/AIDS.

This newfound political momentum led to a substantial increase in funding to combat AIDS. A defining moment was President George W. Bush's launch of the Emergency Plan for AIDS Relief in 2003. This ultimately led to $14 billion becoming available for the benefit of low- and middle-income countries in 2008 – over fifty times more than had been spent in 1996 when UNAIDS was launched.

The international community's response to AIDS shows that global concerted action can help to reorientate and shape the international political agenda. Whenever progress has been made, it has always been the result of policy decisions (Piot, 2007).

We are now at a historical turning point when it comes to tackling AIDS. We are finally achieving large-scale results, which must be sustained. We are also waking up to the fact that AIDS is a long-wave phenomenon. These new insights require a revision of our strategies and new approaches, in which the social sciences must play a greater role (AIDS 2031, 2009).

The need for multidisciplinary action

A hallmark of the AIDS response is its espousal of multidisciplinarity. The absence of a technological fix may have played a role in the unusual diversity of actors who are now working toward a common goal. In the case of AIDS, epidemiological and biological research are still more advanced than sociology, anthropology, economics and political science.

The fundamental role played by social determinants was highlighted by the World Health Organization (WHO) Commission on the Social Determinants of Health (WHO, 2008). A number of attempts at multidisciplinary work in the fields of AIDS and health were unsuccessful. However, there have also been several successful efforts: the work of the WHO Commission, the Commission on Macroeconomics and Health, and the AIDS 2031 project (AIDS 2031, 2009). At a practical level, there has been a productive collaboration on the extremely stigmatized and politicized issue of drug addiction, leading to highly effective HIV-prevention programmes. But on the whole, multidisciplinary work continues to be the exception rather than the rule.

Why is interdisciplinary work so complicated?

The first problem with multidisciplinary work is that people tend to disregard other people's approaches and methods instead of embracing methodological pluralism. In addition to this psychological explanation, and the hermetic nature of the vocabulary of each scientific field, there are three major factors that form disincentives to interdisciplinary work.

The first factor starts with our educational silos. Acquiring an in-depth knowledge of a specific discipline is a key goal for education. However, we could become much better at providing incentives for joint degrees at graduate and postgraduate level, and offer cross-disciplinary career paths.

These silos persist through the ways in which academic institutions are funded, and organize their internal accounting and academic promotions. These often favour individual work and disciplinary excellence. Research proposals are usually reviewed in silos by peers in a particular field.

Whereas in theory we can break down these silos, the process is stalled by the sheer complexity of the phenomena under study and the magnitude of the knowledge that is required. We clearly need to find new solutions, perhaps with the help of complexity science.

Finally, it is one thing for five different specialists to work on a similar topic, and another to have these same experts work as a team. It is the latter form of work that is of most interest to policy-makers.

What can social sciences provide to policy-makers?

For over ten years as the head of the Joint United Nations Programme on HIV/AIDS (UNAIDS), I was a policy-maker. I always tried to have the best possible science at my disposal to inform me, in addition to considerations of justice. This often turned out to be difficult, sometimes because the full evidence was not there, or because I was confronted with competing explanations. In addition, much of the knowledge produced by the social sciences got lost in translation because of poor communication.

The social sciences can fulfil at least four of the policy-makers' main desires: by providing a theoretical framework, analysing and explaining issues, finding solutions, and raising new questions.

Social theories have had a tremendous impact on the construction of the modern world. They have also shaped the current AIDS response model, which, since Jonathan Mann, the founder of WHO's Global Programme on AIDS in 1986, has been embedded in a rights-based approach (Mann and Tarantola, 1996).

A major issue for AIDS activists has been dealing with the conspiracy theories that surround the HIV question, including its very existence and its cause. When a head of state embraces these theories, human lives are at stake (Nattrass, 2007). Equally dangerous are the scientists who try to impose an unrealistic magic bullet solution. Such pseudo-solutions undermine comprehensive efforts and confuse the general public (Piot et al., 2009).

Today, those who fight against AIDS require theoretical insights into concepts of leadership, societal coping and resilience mechanisms (De Waal, 2006; Barnett and Whiteside, 2006). They also have to deal with a post-Westphalian international system of governance of the AIDS response, in which a loosely organized transnational civil society has played a highly influential role in setting agendas.

The experience of AIDS is relevant to theories of smart foreign policy, global public goods, national sovereignty, and the right to intervene when states do not adequately protect their citizens from epidemics. This has been the case for AIDS in a number of countries.

Decision-makers need not only social science theories, but analyses as well. To illustrate this point, let us consider vaccination coverage in contemporary Western societies. Vaccines are one of the greatest advances in medical history, yet parents in a number of countries are increasingly refusing to vaccinate their children for reasons of supposed safety. The problem is not limited to poverty-stricken populations, as is generally the case when it comes to health-care access. In the USA, unvaccinated children are more likely to be white, from high-income households, and to have a married mother with a university education (Bauchner, 2009). Does this challenge the widely accepted assumption that education leads to better health? The answer is No. However, it illustrates the fact that culture and beliefs play as much of a role as economic conditions. Indeed, culture and beliefs with regard to gender are also important explanations for the dramatic health indicators for women and girls in South Asia.

AIDS provides a similar challenge to conventional wisdom on the links between poverty and disease. Whereas the poor are generally more affected by illnesses than the wealthy, the rate of HIV infection in Africa is highest within the high-income categories of the population (Piot et al., 2007). On the whole, the AIDS epidemic is largely associated with inequality questions (including gender and social inequalities) which put people into vulnerable positions in terms of decision-making about sex.

High on my wish list for social science research are an unravelling of sexual and addictive behaviours in different contexts, a better understanding of the structural drivers impacting on the AIDS response, and analytical tools for policy decisions and political leadership.

Ultimately we need to translate innovative ideas – technological and in the social sciences – into actual practices that benefit people much faster than we do today. Think of the low coverage of many effective health and social programmes. The innovation that is required is often about the how, not so much the what or the new. This may require a shift in the funding priorities for both research and aid programmes. It also calls for the development of a new implementation science.

The main obstacles to policy decisions about AIDS derive from the power of pre-existing beliefs, not from scientific evidence. In a number of cases, policies are the product of moral beliefs rather than of scientific evidence. The Bush administration's 'abstinence only' policies are a good example of this, despite the fact that the administration had a remarkable track record in the developing world. Despite a lack of evidence as to their effectiveness, the previous US Congress funded massive abstinence-only programmes. In July 2009 the succeeding Congress abolished the programme, while maintaining the President's Emergency Plan for AIDS Relief. It was not scientific evidence that led to either decision but beliefs.

Science has rarely played a determining role in policy decisions relating to AIDS. It is political activism (by AIDS and gay activists, conservative and religious groups) that has ultimately fashioned policy on the AIDS issue. One notable exception was the Chinese decision to introduce harm reduction programmes for injecting drug users. In this case, decisions were made by a group of specialists whose individual backgrounds were in science or engineering. As in other fields, policy failures are often the result of poor execution or a refusal to accept knowledge on the grounds of belief, rather than any lack of knowledge.

Greater efforts should be made to improve the dialogue with the social forces that ultimately shape policy. In the case of AIDS, this means interacting with politicians, people with HIV, church leaders, and representatives of business. The mismatch between science and policy is a widespread phenomenon that is not limited to AIDS.

Conclusion

To conclude, let me share a few thoughts on the way forward. None of them is original but breakthroughs often come from pushing more of the same at the right time.

First, let us come to terms with complexity, and incorporate it in our work and theories.

Second, let us ask ourselves the following question: how ready are the social sciences for the new wave of technological innovations of the next ten years? It is urgent to anticipate and measure their future impacts, opportunities and risks, and to work with technology developers, marketers and users.

Third, an obvious and urgent task is to create incentives for multidisciplinary education and research in teaching, research, careers and funding. This will require genuine respect for other methodologies than our own.

And fourth, we must learn to communicate better, as so much valuable information is lost in translation. If the arrogance of science competes with the arrogance of power, this is a competition we cannot win.

Above all, please keep asking questions: keep questioning yourselves, and those who are in power.ب

Peter Piot

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9.2 Evidence-based decision-making

Introduction

An evidence-based approach aims at assisting decision-makers and practitioners to identify different policy options to solve a problem, and then to choose between them. One major difficulty for this endeavour is to identify the major cause of a problem and to isolate the impact of an intervention on the factor considered the major cause; that is to say, to measure the impact of that intervention regardless of other possible changes.

Various disciplines and methodological approaches can contribute to identifying what works in a specific context, or what does not work and why. Through long and repeated observations, they may also contribute by identifying the causes of a problem. But in evidence-based research in the social sciences and in causal knowledge, the use of experimental design is a methodological breakthrough. It is used in psychology, and increasingly in economics and in areas related to public service, such as education, health care and prevention, and microfinance. The experimental method allows us to measure the outcome of an intervention on a randomly selected group and compare it with the outcome of a control group who did not benefit from the intervention. Duflo and Takavarasha present several variants of the randomized control experimental approach. They allow the impact of various intervention components to be assessed and measured over the long term and across contexts. The method also allows theories to be tested and unexpected causalities between variables to be observed.

The experimental method requires the use of sophisticated quantitative techniques. But the selection of the policy to be tested implies a thorough review of previous research, and a deep understanding of the context and functioning of the society in which the intervention will take place and of theory building. It may not be used everywhere nor all the time.

Traditional statistics are used more often than designed experiments to measure the impact of government policies. The changing role of the state – moving from an interventionist position to a more regulatory role following the introduction of neoliberal economic policies – has had a great impact on statistics (Desrosières). New concepts of accountability, performance-based management and benchmarking have flourished, leading to an increase in the number of indicators to be calculated. These are not linked, but they are meant to monitor progress towards goals set and to allow comparison over time and across systems or institutions. A culture or ranking (of universities, schools, hospitals, for example) has developed which, even if it is criticized, is probably here to stay (see Chapter 7). The production, dissemination and interpretation of these indicators can increase the tensions between policy-makers, the institutions being evaluated and the statisticians, whose professional autonomy has to be guaranteed. It is not always easy to speak truth to power.

Knowledge production is not neutral. The choice of indicators and the categories used are the result of a technical and political process. The choice of problems to be solved, of the policy or the intervention to be tested in a research experiment, is also political. For a policy to be implemented, it has to be accepted by the population concerned. The early participation of the relevant stakeholders in the research process and the consultation of the population concerned can guarantee a greater sense of ownership (von Fürstenberg). Beyond the concept of methodological robustness, the concept of social robustness has to be taken into consideration, and this requires constant collaboration between researchers, policy-makers and citizens.ب

Social science and policy design

Esther Duflo and Kudzai Takavarasha

Policy design requires a world view or a frame of reference to guide the choice of which priorities to adopt and which solutions to try. Knowledge has its part in shaping a policy-maker's world view. But whether it plays a larger part than intuition, political beliefs or conventional wisdom will depend on the policy-maker's access to rigorous and transparent evidence for what works. This paper questions the role that experimental social science can play in this process.

Identifying what works, with rigour and transparency

A policy-maker faced with a set of possible interventions to improve learning wants to know what would work. Would additional textbooks improve learning? Would extra teachers? Would prizes for teachers work better than prizes for students? Each option under consideration could improve learning, but so could many other things that the policy-maker has not chosen to consider. What they want to know is not whether test scores will increase, but whether and to what extent they will increase because of the intervention. A social scientist, facing a set of plausible explanations for a test-score increase, wants to know exactly the same thing. When social science answers causal questions empirically it answers the core policy design question: would (or does) the intervention have an impact?

This is a difficult question. It requires that we know what would have happened in the absence of the intervention. If we give textbooks to students, we can never know what their test scores would have been had they not received textbooks. The best we can do is to use the outcomes of non-participants – students who do not have textbooks – to estimate the outcomes of the participants had they not taken part in the intervention. The problem is that participants and non-participants are often not comparable. The two groups may differ in other important ways. Schools with extra textbooks may also have more motivated teachers. The difference in outcomes could be due to the effort of these teachers and not the presence of extra textbooks. Such pre-existing differences make it difficult to measure the impact of the intervention.

The only way to even out these pre-existing differences completely is to randomly select the participants for an intervention from a pool of comparable candidates, for example through a lottery. The intervention becomes the only systematic difference between the two groups. When we compare outcomes after the intervention has been implemented, we can be sure that any differences observed are caused by the intervention. PROGRESA, a conditional cash transfer programme to improve education and health in rural Mexico, is an example. A pilot study was conducted in a few hundred villages, chosen by lottery from among all of the eligible villages. These pilot villages were compared with the others, in which the programme started two years later. The evaluation found that PROGRESA significantly improved targeted education and health outcomes (Skoufias, 2005). Since PROGRESA had been shown to be effective, it was scaled up in Mexico and replicated in other countries, including Nicaragua, Ecuador and Honduras. Some of these replications have been accompanied by randomized pilot studies. These studies showed the PROGRESA results to be robust across contexts and implementing agencies.

The case for expanding and replicating PROGRESA was probably advanced by the fact that these experimental impact estimates were more transparent than those from non-experimental methods, such as propensity score matching, regression discontinuity designs and difference-in-differences. These methods attempt to create ex post a group of non-participants comparable to the participants by making specific assumptions. For example, in regression discontinuity designs, non-participants who are just below the eligibility threshold for the programme are compared to participants who are just above. In propensity score matching, non-participants are compared with participants with the same observable characteristics. All these are useful policy evaluation methods, but they

rely on untestable assumptions to interpret the difference between the non-participants and the participants as a causal effect. Experiments, by contrast, do not rely on theoretical assumptions for impact estimation. Justification of the researcher's choices and interpretations play a smaller role in the discussion of the results. This means that the differences between a good and a bad study, and thus between valid and invalid results, are easier to discern and to communicate. Finally, because impact estimates from field experiments are more robust and more transparent, their implications for policy are harder to contest.

Refining knowledge of what works

Sometimes there is evidence that a programme as a whole works but, like PROGRESA, the programme itself may comprise various elements. It is useful to find out why the intervention works: in other words, which of its components or variants are most important to the success of the intervention. If the intervention design is varied and these variants are assigned to different groups, experiments can answer these more refined questions.

The Extra Teacher Program (ETP) was implemented in western Kenya to reduce class size, which had exploded with the introduction of free primary education to over 100 pupils per class in the lower grades in some areas. The ETP pilot funded the hiring of additional young qualified teachers on one-year renewable contracts. This enabled funded schools to split the grade one class into two streams. Did this impact learning? Instead of assigning the same intervention to all pilot schools, the implementing NGO introduced several variants. Some school committees were trained to monitor the extra teachers while other schools assigned students to the two streams based on their preparedness. With this design the researchers could answer questions on the impact of the various intervention components: class-size reduction, young teachers on short-term contracts, monitoring by school committees, or streaming students by preparedness. The findings suggested that what mattered were pedagogy and teacher incentives. With smaller classes and comparable students, teachers could tailor the lessons to student needs, which improved learning for all streams (Duflo et al., 2008).

Evolving knowledge of what works through iterative experiments

Sometimes the questions centre on the interplay between short- and long-term policy effects and on which are the dominant effects over time. If the same population is offered a sequence of experimental interventions designed iteratively, it is possible to answer successively finer questions on a given topic. This iteration paces and accelerates the evolution of knowledge on that topic.

An iterative experiment in a poor population in western Kenya examined the relative impact of free distribution and user fees on the coverage and usage of insecticide-treated bednets (ITNs), used to prevent malaria. In the short term, free distribution increases coverage rapidly; but charging a user fee could in theory increase usage. In the long term, free distribution could, in theory, reduce coverage by reducing willingness to buy ITNs. The first experiment examined the impact of price on ITN demand and usage. It found that as price increased, demand fell precipitously, but usage remained the same (Cohen and Dupas, 2009). If sensitivity to price reduces demand for a life-saving product, how can the sensitivity be reduced? The second experiment piloted a number of marketing campaigns on the same population. None of them had an impact, which suggests that only the price matters, a finding that favours free distribution (Dupas, 2009a). But what are the implications of free distribution for long-term coverage? Would people get used to free ITNs and consequently be less willing to buy them? Or would people learn about the benefits of ITNs and therefore be more willing to buy them? The third experiment suggested that it is the learning effect that dominates (Dupas, 2009b).

Discovering policy

Systematic creative experimentation, in the tradition of research and development, is required to devise innovative solutions. This often requires the policy-maker and the social scientist to break down the distinction between designer and evaluator, beginning their collaboration with the conception and design of the intervention. Such collaborations are more likely in standing partnerships. Here, the social scientist is free to contribute all of his/her theoretical and empirical knowledge, while the policy-maker, free from the threat of political penalties that normally attends failed projects in high-stakes policy environments, can systematically try out innovative ideas, even those that seem unlikely initially to succeed.

For example, the NGO Seva Mandir implemented a programme to raise immunization rates in Rajasthan, India, where they remained low despite free immunization. The low rates are often attributed to unreliable health services and deep resistance to immunization. Another factor may be upfront costs. Research suggests that parents may delay undertakings with large future rewards if they face small upfront costs. Small incentives could mitigate the effects of these costs. Seva Mandir and its partners piloted two interventions: reliable service, by holding travelling immunization camps in the villages at a fixed date; and increased incentives, by giving the mothers a 1 kg bag of lentils (valued at INR 40, or just under US$1). Immunization rates were 6 per cent in the control group, 17 per cent in the group offered reliable service, and

38 per cent in the group offered both reliable service and incentives (Banerjee et al., 2008).

The policy discovery was not that incentives increase uptake. PROGRESA had already shown that. It was that small, non-cash incentives could have such a large impact on the uptake of as vital a service as immunization. Lentils for vaccines is an unlikely idea. It would not seem promising enough to be tried at a large scale, in a high-stakes public health policy environment. Yet its success at the small scale may prompt replication in other settings.

A comparable example is what happened with mass deworming. While its potential as health policy was apparent, it was an improbable educational intervention. An experiment in Kenya, however, showed that the mass deworming of schoolchildren reduced absenteeism by 25 per cent (Miguel and Kremer, 2004). This evidence bolstered the case for deworming, and successful efforts to scale it up now focus on its education gains.

Testing the theoretical foundations of policy

Policy design always uses theory, either implicitly or explicitly. When an intervention is evaluated, the underlying theory is opened up to empirical scrutiny. Experiments are particularly well suited to this because they do not themselves depend on theory for impact estimation. Experimental findings are what they are. When they do not accord with the theory, the social scientist is forced to question and to rethink the theory.

As an example, microfinance institutions and others that offer credit to the poor have to contend, explicitly or not, with 'moral hazard' and 'adverse selection', the theoretical constructs used to explain why it is so difficult to lend to the poor.

Moral hazard says that borrowers with little at stake face a high temptation to default if the repayment burden becomes too high. Thus the poor can only be given very small loans. Since the administrative costs are spread over small amounts, the loans typically have very high interest rates. High interest rates further increase the likelihood of default, which further reduces the loan size, and so on. In the end, there is no rate at which poor clients can borrow and they have to be excluded from credit.

Adverse selection leaves aside the interest rate problem, focusing on information asymmetries. Some projects will fail. The borrowers may know more about this risk than the lenders. Since the lenders cannot know the true risks for every project, they will charge an interest rate high enough to cover the overall risk of failure. This rate may be too high for the safer projects and so they forego the loan. With only the risky projects taking loans, the portfolio will have too many risky clients, which could lead to the complete failure of the credit scheme.

Karlan and Zinman (2005) decided to test whether moral hazard and adverse selection exist in practice. Clients of a South African lender received letters offering loans with randomly assigned high and low interest rates. Some clients responded. Those responding to low-rate offers were given low-rate loans (the low-to-low group because their repayment burden was low and remained low). But those responding to high-rate offers were split into two groups. Half were randomly 'surprised' with a lower-rate loan (the high-to-low group), while the rest agreed to borrow at the original high rate (the high-to-high group). Moral hazard predicts that comparable clients who borrow at a higher rate are more likely to default; and with this design, the likelihood of default could be identified by comparing the high-to-high and the high-to-low groups. Adverse selection predicts that clients who agree to borrow at a higher rate are more likely to default; the likelihood of this could be identified by comparing the high-to-low and the low-to-low groups. The experiment found only weak evidence for either, suggesting a need to rethink the determinants of demand for loans and the behaviour of poor borrowers.

Conclusion

Experiments create a mutually enriching dialogue between social science and policy design. Each experiment answers some questions and asks new ones; the next experiment builds on the previous one, successively adding to and subtracting from our ever-evolving fund of theoretical and practical knowledge of what works in fighting poverty.

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From representative statistics to indicators of performance

Alain Desrosières

Statistics is increasingly a basic instrument used to guide and manage public actions. But what are the linkages between tool of government and tool of proof? The answer to this question can only be a historical one: the state is changing over time. The ways in which mechanisms of power are organized have regularly shifted over the past two centuries. New statistical forms and practices have appeared at each juncture.

The German *Statistik* of the eighteenth century was initially a science of the state. Statistics later became an offshoot of mathematics, used to validate regularities and general rules that had been established through a series of empirical observations. It is still, and increasingly, a basic instrument used to guide and manage public actions. What are the linkages between these aspects: tool of government and tool of proof? The answer to this question can only be a historical one: the state is a changing notion, continuously evolving over time. The ways in which 'mechanisms of power', to borrow Michel Foucault's expression, are organized have regularly shifted over the past two centuries. New statistical forms and practices have appeared at each juncture.

The 'engineer state' of Colbert and the French *polytechniciens* was grounded in practices of direct management and concern with population, fiscal issues and public infrastructure. It gave way to the 'liberal state' whose core characteristic was minimal public intervention. From 1890, the 'welfare state' developed and spread, centred on questions of labour and social protection. After 1945 it was the turn of the 'Keynesian state', which, while adopting free-market logic, was nonetheless concerned with maintaining the economy at a balance, notably through national accounting. It is during the deep economic and social crises of the 1890s and 1930s that the welfare and Keynesian state models grew and became accepted.[1] The crises of the 1970s and 1980s coincided with severe critiques of these forms and their gradual replacement by a 'neoliberal state', in which quantified performance indicators play a decisive role.

1. For a more detailed presentation of this state form typology and of their respective statistics, see Desrosières (2003).

The statistics that are used by these successive state-form approaches are 'representative', since they are meant to offer the most appropriate tool to represent and describe societal aspects for which public action is regarded as legitimate and necessary. The aspects themselves vary depending on the epoch. Among the available tools we find the census, civil registers, surveys, administrative registers, and national accounting. Allegedly, the data they produce is sufficiently strong to model and adjust public policies developed by one actor, the state, which places itself above and outside the private interests of businesses and individuals.

This configuration changes with the spread of the neoliberal state and the critiques of the welfare and Keynesian state systems that have developed after the profound renewal of liberal theory (Foucault, 2004). In its pure form – as those who promote it argue – the ultimate objective is less the frequently stated one of restricting the state's role, and more a matter of transforming it through the development of radically new instruments. These include legal tools and institutions that secure and organize free and undistorted competition, and state organs that are transformed into 'agencies' managed like private enterprises. These agencies are no longer considered as being above other actors. They develop contractual relations among themselves, under the auspices of private law. Their performances are evaluated through the use of quantitative indicators. Benchmarking makes it possible to compare them and to make them compete against each other.

Performance indicators represent one of the key aspects that distinguish this state form from the minimal liberal state of the nineteenth century. The representative statistical tools that quantify a nation's growth, unemployment and inflation are of course not replaced.

However, performance indicators are used for different purposes from these. The European Union is already partly organized along neoliberal principles. European policies are effectively of two different types. On the one hand, policies relating to the markets, competition and money are Community-driven and governed by the Rome and Maastricht treaties. In this case, the Directorate-General for Competition uses corporate statistics to detect and manage potential antitrust activities. But other policies (for example on labour, education, research and exclusion) continue, in principle at least, to be under Member State control. An intergovernmental procedure has been set up, the open method of coordination (OMC), based on the selection and harmonized quantification of target indicators, and intermittent assessments of national performance. By sharing their 'good practices', Member States supposedly contribute to the enhancement of the overall results. This method was initiated in 1997 to drive a 'European employment strategy', and was then promoted to coordinate research and education policies as well as policies to fight exclusion (Bruno, 2008).

The main difference between such a 'performance-based' logic and previous instruments is that the actors (in this case, EU Member States) compete against each other. Previous state instruments were implemented at a higher level, for example macroeconomic and macrosocial policies. The same logic can be found in the reforms that were introduced throughout the 1980s in New Zealand, the UK and Sweden. They were inspired by management methods that were tested in large private corporations and transposed to the public sector under the name of 'New Public Management' (Hood, 1998). The characteristics of the service provision and the performances of the concerned parties are standardized, quantified and contractualized. On the basis of these qualities and performances, new spaces of equivalence and comparison are developed, notably between the present and the future (through conventions of actualization). Policies are evaluated through a series of indicators.

Unlike the well-articulated and coherent models of the Keynesian era (notably those of the national accounts),[2] these indicators are poorly related to each other by logical or statistical relations. They can be criticized and transformed without bringing into question the underlying logic that underpins this way of managing competition between actors. University rankings, for instance, have taken on great importance in a seemingly irreversible manner. The criticisms that are made of them, however numerous, do not fundamentally alter this form of competition grounded in a unified set of criteria (Espeland and Sauder, 2007). One of the most frequent criticisms is that professionals coming from various domains are dispossessed of their own specialisms through the imposition of a set of standardized criteria (Miller, 1994).

Relations between public statistics built according to rigorous principles of objectivity and neutrality, and indicators aimed at evaluating and fixing objectives for public policy, are not easy. Indeed, as 'accountability' specialists have argued for a long time through the Goodhart law: 'When a measure becomes a target, it ceases to be a good measure' (Bird, 2004). This problem was the origin of the widespread disregard for Soviet statistics that were associated with state planning.

Over the first few years of the twenty-first century, other criticisms of prior public statistical measures have been formulated from a 'well-being' perspective (which is itself controversial). The main criticism is that traditional statistics often serve to classify countries (Gadrey and Jany-Catrice, 2006). Gross domestic product (GDP) is criticized on the grounds that it does not count non-monetarized services (particularly those of women), it does not sufficiently consider inequality and poverty, and most importantly, it does not account for the environmental consequences (mainly for climate and biodiversity) of economic growth. The conjunction of the environmental, financial and economic crises and of these critiques could produce a statistics for the twenty-first century, linked to an ecological, social and feminist state that has yet to be imagined.

2. National accounting is a well-articulated and coherent tool for measuring a nation's economic flows, notably through a double system of accounting constraints of equilibrium between the 'resources' and the 'employments', according to, on the one hand (in columns) the 'agents', and on the other (in rows), the 'operations'. The (notably Keynesian) macroeconomic models which were used between the 1950s and 1980s increased this logical integration. However, the 'indicators' of new public management are often enumerated one after the other, without any apparent concern for such conceptual integration.

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Mapping out the research-policy matrix: UNESCO's first international forum on the social science–policy nexus

Christina von Fürstenberg for MOST Secretariat, UNESCO
www.unesco.org/shs/most

In 2006, UNESCO's Management of Social Transformations programme (MOST) held an international forum on the social science–policy nexus (IFSP) in Uruguay and Argentina. It consisted of different workshops in five thematic areas: Global Issues and Dynamics, Social Policies, Population and Migration, Urban Policies, and Regional Integration. Opinions varied on the role of social scientists in policy-making.

This paper highlights some major findings of the international forum on the social sciences policy nexus (IFSP) held by UNESCO's Management of Social Transformations programme (MOST) in 2006.

While there was an implicit consensus that it was important to link research and policy, opinions varied on the role of social scientists in policy-making. While most contributors expected social scientists to explain the causes, context and effects of policies, some expected them to refrain from the implementation process. Ensuring research independence and autonomy from political power proved to be highly controversial. This controversy was mostly provoked by the deep historical, political and epistemological implications of such involvement, and by mistrust of the goals that may be driving the linking of research to policy.

Towards a different understanding of the link between social science research and policy

The forum concluded that there is a need to distinguish – in both epistemic and political terms – between instrumental and conceptual approaches to the interface between social science and policy. Some approaches or authors have a rationalistic understanding of how research influences policy. This leads them to focus on policy-relevant research and identify different kinds of knowledge gaps. From this point of view, the absence of policy-relevant research, policy-makers' low level of access to research and data, and the lack of communication and comprehension between researchers and policy-makers, are all facets of a problematic relationship.

On the other hand, many actors involved in the policy process focus on the more wide-ranging, interactive and indirect ways of using research-based knowledge. In this approach, the links should not be understood in terms of the direct impact of policy-relevant research on policy decisions, but rather through broader patterns of socio-political, economic and cultural influence, thus questioning the presuppositions of research relevance.

Evidence: a hotly disputed issue

Another forum finding is that evidence has many meanings and can be produced in different ways. This was highlighted by the multitude of synthetic – if not syncretic – approaches employed by the participants.

Many in policy-making consider that extensive, quantitative data and statistical analysis produce the only forms of reliable evidence. However, these provide only one kind of social scientific evidence. The search for the right statistics or best practices to address specific social problems goes hand in hand with a vision of the social sciences as an instrument that can provide foolproof answers. A great majority of the participants highlighted the political nature of knowledge and, by extension, the political nature of amassing and presenting evidence. Critical comments stressed that knowledge production is always vested in normative frameworks. Different knowledge paradigms aim to order the social sphere differently and refer to different pools of evidence. Statistical robustness and a wealth of hard data cannot arbitrate between conflicting claims.

The challenge that these insights present to the standard, rational model of policy-making and evidence adjudication emphasizes that evidence can be collected via a variety of techniques. Historical and anthropological research involves more interpretative human studies, and these have their uses in this context. So has direct contact with affected populations. This provides critical and reliable knowledge when it comes to understanding and responding to social

Demonstration concerning immigration, Italy
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needs. This kind of data can complement and enrich quantitative analyses.

What kinds of knowledge do policy-makers need?

Policy-makers need knowledge that is both intellectually credible and socially relevant. Optimally, they prefer concrete social scientific results which provide practical solutions to concrete problems. On the other hand, many of the synthetic approaches proposed by the contributors highlighted the point that social research has an indirect and conceptual influence on policy-making. Social research which at first seems irrelevant and impractical may become indispensable in the mid-term, changing the way problems are approached.

Knowledge at its best is socially grounded. Increasingly, policy-makers need knowledge that is both socially relevant and socially robust, produced through interaction with affected populations and relevant stakeholders. Policies that take account of the social barriers to change and of the values, expectations and behaviour patterns of affected communities are more likely to succeed and take root than those designed by isolated bureaucracies. The production of scientifically valid, socially accountable and politically relevant knowledge requires tripartite mediation as well as constant communication and collaboration between researchers, policy-makers and citizens.

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9.3 Knowledge brokers and think-tanks

Introduction

To fill the gap between academic researchers and the full range of knowledge users, policy-makers and civil society members, a large number of research institutions, brokerage agencies, foundations, consulting firms and polling organizations have emerged outside universities in the past few decades. Those that inform public debate can be publicly financed and attached to a government department. But many are private, attached to a variety of civil society organizations, trade unions, political parties, NGOs and big foundations. Think-tanks are one form of these institutions meant to mediate the research and policy interface (Anheier). The first think-tanks appeared in the USA at the beginning of the twentieth century, and played a significant role after the Second World War. But in recent decades, think-tanks have developed rapidly in the countries of the global North, particularly in the USA and the UK. Privately funded, carrying out empirical and multidisciplinary research and commissioned by a variety of users, they represent a new model of knowledge production. What is the role of these think-tanks? How do they function and what is their contribution to policy debate?

The definition of a think-tank varies, as do their functions. Some are quasi-universities; others are more engaged with specific advocacy groups and stand at the political forefront. Yet others work on demand for third parties. Their common characteristic is an orientation towards the future and towards applying knowledge to current and future events in policy and politics (Anheier). Many of the researchers operating in these institutions have an academic background. They contribute to the war of ideas, but also to enriching public policy debate. Issues are raised concerning the quality of their research, since unlike universities, they are not assessed by a rigorous process such as peer review (Asher and Guilhot). They are evaluated by their sponsors and the funders' market, but this is not a guarantee of quality.

Could this model of research organization, supported by mixed funding, promoting interdisciplinary research and sensitive to market demands, be considered appropriate for academic research? To a certain extent, new university funding mechanisms and assessment methods have brought the two models closer, and in the process have blurred the distinction between traditional academic research in universities and that conducted elsewhere (Asher and Guilhot). Nobody really challenges the need to keep a strong academic research sector doing basic research, while also providing expertise on issues of the day alongside other agencies. Open and critical reflection is needed on the kind of relationship that should exist between research and decision-making, and the kind of research evidence that policy needs.

Social science research outside the ivory tower: the role of think-tanks and civil society

Helmut Anheier

Think-tanks are one of several systems of knowledge creation in modern societies. Their greater prominence signals a major shift in the demand, production, supply and dissemination of knowledge. Whether autonomous, political or demand-driven, think-tanks are the institutions in modern societies where wars of ideas are fought out. They are typically located at the political forefront, connecting constituencies and serving their knowledge needs and interests.

Think-tanks are one of several systems of knowledge creation in modern societies. Their greater prominence signals a major shift in the demand, production, supply and dissemination of knowledge. Think-tanks are the institutions in modern societies where 'wars of ideas' (Smith, 1989) are fought out. These in turn motivate specific research projects, policies and debates. They bring together ideologues, political entrepreneurs, scientists, policy experts and policy-makers to discuss the future in terms of programmes, policies and influence (Rich, 2004). More generally, think-tanks are typically located at the political forefront, connecting various, often opposing, constituencies and serving their knowledge needs and interests.

Think-tanks have significantly contributed to several fields ranging from health care, media, human rights and equal opportunities to education, security and political reform. They have influenced policies in all of these fields. The Urban Institute, for instance, has contributed to the advancement of the cause of minorities in the USA; the Adam Smith Institute to the development of neoliberal policies; the Hoover Institute to democracy; the Rand Corporation to security issues; the Bertelsmann Foundation to university reform; and the Brookings Institution to economic and social policies.

There are three basic types of think-tank.[1] The first type has been termed 'universities without students'. These organizations pursue knowledge in a scholastic fashion, knowledge for the sake of knowledge. They are typically shielded from the wider academic, political and economic systems that surround them through different institutional and financial arrangements ensuring a high level of independence. The Institutes for Advanced Study in Stanford, Princeton and Berlin are examples of think-tanks that celebrate individual scholarship and academic independence.

A second group of think-tanks is formed by advocacy groups which pursue ideological or political goals. These organizations place a particular emphasis on knowledge dissemination in order to support policy positions and advance their own agendas and those of their allies. Examples include the Heritage Foundation and the Cato Institute in the USA, which both seek to push through liberal economic policies.

A third group consists of think-tanks that produce knowledge on demand for third parties. The knowledge they produce is sold and licensed for use in either market or non-market contexts by governments, corporations, foundations or individuals. Examples include the Rand Corporation and the Urban Institute in the USA.

The latter two types have experienced significant growth in recent decades. However, the kind of knowledge they produce differs from the knowledge created through basic research at universities or university-like institutions. It is typically concerned with the application of ideas to current events and policy issues, with a focus on short-term rather than long-term projects and programmes. In this sense, certain think-tanks bear a resemblance to consultancy firms.

Of course, some think-tanks are combinations of these three types, and no dominant organizational form has emerged. Today, the label 'think-tank' is used to describe a diverse set of organizations: government research units, international organizations such as the OECD, NGOs such as Transparency International, and corporate research entities

1. Several classifications of think-tanks exist that are variously based on revenue structure or objectives (Braml, 2006; Gehlen, 2005).

such as the Nomura Research Institute (Stone, 2007, p. 267). Indeed, as think-tanks have evolved, so has their form. While many are non-profit organizations (particularly in the USA, the UK, Australia and Germany), with their own endowments or donors, others are governmental agencies and quasi-public entities.

The history of think-tanks reveals that their origins are to be found in civil society, and that civil society stakeholders, in particular foundations, have been among the most influential in shaping their evolutions. Government and business interests have played significant roles as well. Gehlen (2005) has suggested four major phases in the development of modern think-tanks, each reflecting the shifting nature of civil society, government and corporate involvement over time:

Proto think-tanks originated the UK and the USA in the nineteenth century as academic and civic institutions. They combined scientific, public policy and social concerns. As civil society organizations, they were generally the product of a largely urban elite, outside established academic institutions and partisan groups. Examples include the Franklin Institute in Philadelphia (1824) and the Fabian Society in London.

Progressive-era think-tanks (ca. 1900–1920) such as the Russell Sage Foundation (1907) and the Carnegie Endowment for International Peace (1910) took on openly reformist agendas and integrated the nascent social sciences into their search for solutions to the problems that affect our industrial societies. With the support of private philanthropists, they were able to diversify their sources of income. By the 1950s, they established themselves as an independent sphere of knowledge production alongside universities.

During the Second World War and the Cold War era, the private sector and governments increased their involvement in think-tanks. Security (such as the RAND Corporation) and social policy issues dominated, in addition to racial segregation, poverty and urban decline in the USA. Examples include the Institute for Research on Poverty (1966) and the Urban Institute (1968).

From the 1970s onward, think-tanks grew in scale, scope and numbers. Governments, corporations and civil society actors created, promoted and supported think-tanks. New think-tanks soon played an influential role in political and policy-making circles (such as the Adam Smith Institute, Bertelsmann Foundation, Centre for European Policy Studies, French Institute of International Relations, and the Heritage Foundation). Existing think-tanks expanded, specializing in new areas of research (such as the RAND Corporation and the Urban Institute).

Nine out of ten existing US think-tanks were founded after 1951, and they more than doubled in numbers between 1980 and 2007. Little systematic information is available on the number, scale and activities of think-tanks in non-OECD countries. Despite the limited data, McGann (2007) has counted 5,080 think-tanks worldwide, 38 per cent of which are in North America, 24 per cent in Europe, 12 per cent in Asia, 8 per cent in Latin America, 5 per cent in Africa and 4 per cent in the Middle East.

McGann (2007) and others (e.g. Weiss, 1992; Gehlen, 2005) see a number of related reasons for the expansion of think-tanks. They include the growing complexity of many policy issues and demand for the analysis and development of policy alternatives, but also the growing need for quick, reliable and easy-to-understand answers to policy questions that neither government, corporations nor academia could supply in a timely and cost-effective manner. For Stone (2007), the greater availability of philanthropic funds over the past two decades has driven the development of think-tanks, along with democratic consolidation, economic development, and growing political stability (Anheier and Daly, 2005).

The multitude of information and knowledge available is both a cause for and the outcome of civil society's greater involvement in the public sphere, and has been facilitated by lower communication costs and greater media access. With information being provided and demanded by a variety of actors and institutions, knowledge itself has become both a private commodity and a quasi-public good. Think-tanks have become demand-sensitive knowledge producers for a multiplicity of clients, including civil society actors, governments and corporations. Naturally there are divergences depending on the national context. Countries with poorly integrated party systems (for example, the USA) create higher demand for think-tanks than countries with rigid party structures (the UK) and strong ministerial bureaucracies (France) or both (Japan).

Think-tanks and the policy process

Uncertainty and multiple uses of knowledge for policy and politics are the think-tanks' *raison d'*être. Recently, however, the role of think-tanks in policy-making has been criticized. Stone (2007) seeks to debunk the myths embodied in the still nascent literature about think-tanks: their image of themselves as thinking organizations, their

dedication to the public good, and their role as a bridge between the social sciences and policy. Instead, in her view, a number of think-tanks are opportunistic and frequently fall hostage to professional and corporate interests. They are only interested in winning grants or contracts; and serve as holding pools for political has-beens.

The level of bridge-building and service to the public good that think-tanks can deliver, and the amount of thinking and knowledge creation they can do, depend on the kind of policy environment they find themselves in. If we reach a point where 'neither political knowledge production nor knowledge exchange is apolitical' (Stone, 2007: 275), their role will be reduced. Nevertheless, they will still make an important contribution. They provide a multiplicity of open grounds on which wars of ideas can be fought out, and test sites for policies to be contested. In this sense, think-tanks contribute to modern societies' problem-solving capacity.

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Explaining research, USA
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The collapsing space between universities and think-tanks

Thomas Asher and Nicolas Guilhot

The ecology of the social sciences is increasingly less limited to traditional academic institutions. As short-term advocacy or policy needs drive knowledge production, the risk is that research will reinforce rather than challenge commonly held ideas and values. The reduced space between university research and policy leads to a blurring of research and activism, once the hallmark of think-tanks.

A wide range of bodies are involved in the production, diffusion and communication of social-scientific knowledge. These extra-university bodies include administrative agencies, philanthropic foundations, public and corporate research bureaux and various para-academic organizations. They produce social statistics, methodological innovations and social science studies. Among these institutions, think-tanks figure prominently as purveyors or brokers of social science knowledge.

The rise of the think-tank

Initially close to the academic world, the policy research institute of the early twentieth century became a central institution of the Cold War science regime in the USA. During the 1970s, these 'university campus[es] without students' (Mirowski and Sent, 2002: 18) evolved again into various shades of conservative or neoliberal think-tank, in the context of a downsizing of the research capacity of US public administrations (Smith, 1991). This process accelerated in 1994 with the gutting of the Congressional Budget Office, the defunding of the Arms Control and Disarmament Agency and the closure of the Office of Technology Assessment. The work of these institutions in the promotion of non-partisan research for the public interest was outsourced to a range of think-tanks. These proliferated throughout Washington, DC and beyond to become a global model for policy dispensation (Stone and Denham, 2004). The recent commitment by the Bill & Melinda Gates Foundation, the International Development Research Centre and the William and Flora Hewlett Foundation to provide US$100 million over ten years to strengthen think-tanks in the global South underscores the prominence of these institutions for the formulation of research to address national policies.

Today, the relevance of think-tanks for the future of the social sciences has less to do with their use or even abuse of social science research than with the alternative model of knowledge organization they represent. Their approach is characterized by reliance on private funding, proximity to corporate and policy interests, and a tendency to generate studies that reflect both funding and media exposure opportunities. Such 'research for hire' is sometimes contrasted with a somewhat idealized image of disinterested scholarship. Acting in a competitive marketplace of ideas, close to corporations and economic interests, think-tanks seem far from the Mertonian model that establishes disinterestedness as one of the normative foundations of modern science (Merton, 1942; 1973), or the Weberian portrait of an objective and neutral scientific ethos (Weber, 1918; 1946). Yet current trends in higher education and research finance, as well as the re-engineering of universities in the context of a putative 'knowledge economy', have blurred this distinction. Increasingly, academic institutions are required to operate in a competitive environment, to develop ties with corporations, to deliver just-in-time research to external clients, and to fund their research activities externally. Interdisciplinary research centres which seek external funding for projects that are usually tailored to fit this purpose have appeared alongside traditional departments, to become the familiar face of this hybridization of universities and think-tanks.

Think-tanks and new trends in research organization

Think-tanks are an alternative template for knowledge organization, one that is attuned to the current discourse on higher education reform that extols the 'new production of knowledge', 'Mode 2 knowledge', or the 'knowledge

economy' (Gibbons et al., 1994; Nowotny et al., 2003). This template is premised on several assumptions: that research should be driven by practical problems rather than disciplinary questions; that innovation is better produced by ad hoc interdisciplinary teams than by university departments; and that competition for funds ensures responsiveness and accountability in research, and guards against the insulation of an ivory tower unconstrained by oversight and overtaxed with emulation. This discourse has gained much traction in policy circles, despite involving unwarranted ideological claims and a lack of supporting empirical evidence.

The reorganization of research institutions on the think-tank model is also based on the assumed superiority of markets as distributed information processors. In this context, the creation of a genuine marketplace of ideas requires the removal of the rigid institutional structures that characterized previous academic arrangements. A recent World Bank report on knowledge societies advocates the application of post-Fordist principles of flexible specialization to the research university:

> *The need for tertiary education institutions to be able to respond rapidly to changing labour market signals and to adjust swiftly to technological change may also require more flexible arrangements for the deployment of academic staff and evaluation of performance, including moving away from civil service regulations and abandoning tenure-track appointments. Under a more radical scenario, the multiplication of online programmes and courses could induce tertiary education institutions to contract independent professors not affiliated to any specific college or university to prepare tailor-made courses*
>
> (World Bank, 2002, p. 27).

While this prescription applies to teaching, it also orients research innovations. More than a mere slogan, the marketplace of ideas that think-tanks claim to have inaugurated is becoming gradually institutionalized as a device for the development and assessment of university research programmes.

What are the implications of these recent developments for the social sciences?

The tendency to reconfigure the institutional set-up of the social sciences around immediate problem areas entails a process of de-disciplinarization. Disciplines are viewed as self-contained, unaccountable, and too rigid to provide research products in a sufficiently responsive fashion. More often than not, the term 'interdisciplinarity' refers less to the complementarity between established methodologies than to a novel set of criteria for what constitutes good research. Suspending disciplinary forms of evaluation opens the research process to external control according to a set of criteria that are no longer established by scientific communities.

This shift raises issues about the validation of scientific knowledge. The principle of peer review comes to be seen as a cause of disciplinary over-specialization and the self-referentiality of much social science research, rather than being a condition of scientific progress. The ideals of academic freedom and scientific autonomy, which insulate scientific production from external influence, come to be seen as obstacles to the smooth functioning of a knowledge economy. This view leads to increasingly frequent calls for the abolition of tenure and the imposition of a research-for-hire model. The re-engineering of research on a competitive, funding- and communication-driven model tends to bypass the traditional circuits of scientific validation, and to generate uncertainty as to what really defines scientific value.

As the project format becomes prominent within university research programmes and imposes its own time constraints on the research process, the timeframe of consensus formation in the social sciences tends to overlap increasingly with that of consensus formation in policy-making and the media. Social scientists are encouraged to produce research rapidly and to work on the same set of assumptions as policy-makers or advocates. As short-term advocacy or policy needs drive knowledge production, the risk is that research will reinforce rather than challenge commonly held ideas and values. The reduced space between university research and policy leads to a blurring of research and activism, once the hallmark of think-tanks.

What are the implications of blurring research and advocacy?

The push to develop engaged social scientists frequently displaces an emphasis on long-term, basic research. Instead, university administrations and the foundations that support academic institutions are making explicit calls for the development of university expertise modelled on think-tanks. Such expertise tends to be topical, focused narrowly on current concerns and crises. It is identified by its potential as a tool of advocacy, particularly in the space of public policy. Most notably, it is no longer the university setting

or peer review that gives authority to expertise. Instead it is increasingly legitimized through the public communication of knowledge. Media appearances, participation in policy forums and consultation with government officials demonstrate and reinforce existing concepts of expertise, and create 'experts' in the public domain (Abelson, 2004; Rich, 2004). The result is a paradoxical situation where expertise is used as a rhetorical device to legitimize the absence of legitimate scientific authority.

This outcome is perhaps salutary on one level. This concept of expertise opens up the possibility of a more responsive and engaged social science community, one that is oriented towards worldly problems and is unwilling to leave public communication to pundits and representatives of think-tanks. Yet more communication is not sufficient for the development of sound policies, even when scholar-activists wield carefully considered analysis, informed by strong research and deep contextual knowledge of an issue. Without a mechanism for developing a conversation about the public use of social science knowledge, a politics of expertise is unleashed by which multiple opposed voices clamour for attention, without a means of resolving their differences. A healthy deliberative democracy requires forums that allow critical reflection on the relationship of research to policy-making, and the kinds of evidence that ought to inform this relationship. Yet these forums are too often absent. Instead, the short-term, problem-oriented project economy on which researchers increasingly depend erodes the legitimacy of disciplines and politicizes the production of knowledge. This ensures the irresolute reception of research findings, which casts doubt on the mission of think-tanks and universities alike.

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Unequal development, Mexico
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Chapter 10
Conclusions and future lines of action

Adult and child learning to read
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10 Conclusions and future lines of action

With global challenges and change affecting all human societies, social science knowledge is more crucial than ever. The contribution of the natural sciences to the struggle against these global challenges is indisputable. Yet this Report illustrates many ways in which the methodological, analytical and critical resources of the social sciences also grant them a key role, far greater than many might believe. In a wide variety of ways, the social sciences teach us that 'global' is not the same as 'uniform'. The same challenge or social trend will be seen differently in various societies, and this means that responses to change need to be adapted to context.

Climate change is a case in point. The struggle against its effects, and for the reduction of greenhouse gas emissions, supposes a thorough knowledge of local contexts, and broad understandings that jointly articulate global and local contexts. Social sciences are crucial to identifying the problems that underlie, result from and aggravate such change, and they then provide the basis for developing sustainable solutions to such problems. Another example is poverty. Fighting against poverty requires global mobilization and worldwide studies. However, meaningful solutions require an understanding of how the poor apprehend their situation, what they most suffer from, and how to mobilize them best. We are in a period in which local studies and global theorization are both needed.

But there is more to the significance of social sciences in today's world than the acknowledgement that 'context matters', an axiom that no one will contest in theory, even if they do so in practice. Under favourable conditions, social sciences accompany the evolution of human societies. They are shaped by the transformations in societies and at the same time invite societies to reflect and act upon themselves. Are social sciences in a position to fulfil these functions at the beginning of the twenty-first century? Or do the divides in their organization impede them? The report maps out the condition of social sciences throughout the world and considers the impact of various factors on social science knowledge production and use.

The report points towards positive achievements worldwide in the ten years since the last *World Social Science Report*. These include: the enormous increase in the number of graduate and postgraduate students in social sciences, which has increased faster than the overall increase in university enrolments; the multiplication of publications; the increased demand for social science knowledge and skills; and the growing influence of social science concepts and theories in public debates, and their greater dissemination in scientific communities and societies. This has been made possible by advances in information technology, and has occurred in spite of sometimes limited access to specialized reviews and websites. Beside these positive achievements, the Report portrays a number of inequalities and asymmetries. It identifies eight divides:

- a geographical divide
- a capacity divide
- the unequal degree of internationalization of knowledge production
- the divide between disciplines
- the divide between mainstream research and alternative approaches
- the competition resulting from new managerial practices
- the sometimes tense relations between academics and society and between academics and policy-makers.

To varying degrees, these divides undermine the capacity of social sciences to contribute answers to global challenges and to analyse trends affecting human societies. A series of conclusions can be derived from the various contributions to this volume, and in general terms they can be grouped under two main headings: the persistent disparities in research capacities, and knowledge fragmentation.

Persistent disparities in research capacities

In spite of very positive achievements, a number of striking inequalities persist across regions and within countries. While the number of researchers, students, graduates, including Ph.D. graduates, and publications has increased everywhere over the past decade, the internationalization of knowledge has strengthened the existing big institutional players: North American and European journals, bibliographical databases, universities and research centres.

During this period, some countries have significantly improved their research capacity and have emerged as important centres of knowledge production. European, including east European, social sciences have improved their presence in international networks and publications. Brazil and China have significantly expanded their numbers of social scientists and of publications in international journals. These examples suggest that comprehensive and well-funded long-term policy by governments, regional organizations and associations can be decisive in the reinforcement of social science capacities. In Brazil and China, such comprehensive policies have included improvements in research infrastructure and local education facilities, the development of postgraduate programmes in first-grade universities, exchange programmes for students and professors, scholarships, and subsidies for publication and translation.

The biggest inequalities in social science performance largely result from differences in funding for higher education generally and for research in particular. There is enormous inequality between the well-funded institutions of the global North and the highly underfunded ones of the global South. In some emerging countries, major commitments to higher education and social science research are bringing rapid advancement. At the other extreme, already difficult situations in developing countries have been worsened by political instability and conflicts. Examples of such countries can be found in sub-Saharan Africa and South Asia. In between these extremes several countries and knowledge institutions in the global South have supported training over research, and quantity over quality in social sciences.

The relative and sometimes absolute decline in public support for social science research is not limited to developing countries. It is not a new phenomenon either: it started in the 1980s, but the trend was certainly not reversed in the first decade of the twenty-first century. Instead, a number of policies and management tools were gradually put in place which were intended to compensate for this relative decline. These policies resulted in the marketization of research, the multiplication of research centres and consultancy firms outside universities, increased competition for funding, greater attention to the international ranking of institutions, and evaluations being increasingly based on quantitative indicators. The impact of these new developments on capacity is mixed, depending on the context and the strengths of the research institutions involved.

In developing countries, the marketization of research has resulted predominantly in the multiplication of non-state actors outside universities, especially consultancy firms and non-governmental organizations (NGOs) funded by international agencies. To an extent, this has allowed some research to take place where public funding is no longer available, thus giving social science research some visibility and credibility. But the explosion of consultant-led research has influenced the type and nature of the research conducted. It has given undue prominence to certain themes, easily funded by aid agencies, and has led to an overemphasis on data collection, empirical studies and expertise-oriented work at the expense of more theorized research. Furthermore, the quality of such research is far from guaranteed, since consultancy firms and NGOs work under strong time pressure and often shift quickly from one theme to another. Consultant-led research has also contributed to the internal brain drain. Private and semi-private agencies and organizations offer researchers far better working conditions than universities can. This form of research can also lead to the creation of a large pool of temporary researchers waiting for a full-time position. In this sense, the marketization of research has been detrimental to academic social science research but also to institutional capacity.

In developed countries, the marketization of research takes somewhat similar forms, but its effects are far less harmful to academe and to research. The emergence of NGOs, consultancy firms and think-tanks has encouraged the development of a more responsive and engaged

Rebuilding National Office of Ethnology, Port-au-Prince, Haiti, after January 2010 earthquake
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community, oriented towards today's problems. But it can unduly politicize the production of knowledge and encourage partisanship. This raises the question of the quality control of the research produced. Another concern is for the number of 'invisible' researchers: that is, those in unstable and uncertain professional situations.

Project funding

The relative increase in project funding and the decrease in core funding are not unrelated to the marketization of research, and can exert similar pressures. At a general level, project funding was meant to stimulate researchers to increase the quantity of their output and to promote excellence. It was also meant to encourage interdisciplinary and policy-relevant studies. In many cases this succeeded, but a deeper comparative analysis of the impact of project funding remains to be done. Project funding can be detrimental to academic research if short-term projects are overly privileged, if researchers are overburdened with administrative tasks, if only a handful of funding agencies are active in a region or country, or if only restricted research agendas are supported. These potential threats are present in all regions and countries. But they are more damaging in regions with limited – or no – deep-rooted capacity in social sciences. The degree to which funding agencies – national or international, public, private, semi-private or NGOs – have become prescriptive and influence research agendas also varies across regions and between countries.

Quantitative evaluation methods, bibliometrics and ranking

Project funding leads to greater competition for funds and often to quantitative evaluation of outputs. Many social science research systems now include mechanisms to evaluate outputs and assess the impact of programmes, research projects and individual academics. This tendency is strong in developed countries, where management-like practices of yearly reports and accountability have become the routine of many academics, and where mechanisms to ensure quality have been institutionalized. Nevertheless, it is no less predominant in regions where a large share of the research output is funded by aid agencies and NGOs. Brazil, China, Mexico, South Africa, Venezuela and other countries implement similar evaluation mechanisms. Often the notion of 'excellence' is a watchword for competitive systems. But striving for continuous quality improvement may be a more effective and realistic strategy, even in countries with strong research capacities.

Two other phenomena have become prominent in academic life in recent years: bibliometrics and rankings. These tools increase competition between institutions.

Bibliometrics is largely used in the evaluation of institutions, programmes and sometimes, in combination with peer review, researchers themselves. However, its use in the evaluation of social science research has serious limitations. The main instruments of bibliometrics, databases and citation indexes, focus on a relatively small number of international journals and do not adequately mirror social research landscapes, particularly in countries outside the global North.

The national and international ranking of institutions has mobilized attention and raised much concern among researchers, heads of universities and policy-makers in the global North, but also in emerging countries. Most rankings have strong biases that are detrimental to social sciences. Their impact on capacity is not well known, although it is likely that the best students try to enrol in top-ranked institutions, and lecturers and researchers do their best to join them. Ranking and bibliometrics reinforce existing hierarchies and favour the concentration of funds in the best-ranked institutions, possibly limiting variety in social science research themes.

Despite the numerous debates and discussions on their methods and value, bibliometrics and international rankings surpass any alternatives as means of comparison and benchmarking in academic competition. Whatever criticism they face, they are likely to endure and influence the university landscape. Nonetheless, they do require improvements. The evaluation of research systems, institutions and researchers needs to combine bibliometrics with qualitative criteria such as peer evaluation. Furthermore, the number of national and international databases and indexes should increase, thus encompassing a greater share of the world's social science production. The number of university and department rankings also needs to increase to include different measures of success and strength, thus better mirroring quality in social science research and teaching. The model that is used in some countries, in which various university rankings are produced based on a wide variety of indicators, seems to do better justice to the various functions of a university.

Brain drain and professional migration

Professional migration is another major trend affecting research capacities everywhere, albeit in different ways. In regions and countries with very weak social science capacities, academic brain drain endangers research as well as teaching. Africa is particularly at risk, but is not unique in this regard. The migration of social scientists often starts with the migration of students who study abroad and who, at the end of their studies, join a research team in the country where they studied. Various countries have put incentives in place to persuade graduates to come back after graduating from a foreign university. But the efficiency of these measures is moderate, and promises to remain so unless working conditions improve significantly in the sending countries. Regions and countries with better social science capacity also suffer from the brain drain. But they have more scope to counter its effects with programmes dedicated to attracting qualified academics from other countries, so that they can benefit from increased diversity in their recruitment.

Still, mobility is not all one way. New poles of attraction have developed, researchers circulate, and after years spent abroad, students and professional social scientists may return to their country of origin. When this happens, brain circulation is beneficial for the sending regions and countries. It offers opportunities to confront ideas and transfer new concepts, and helps integrate local scholars into the networks of a worldwide knowledge system.

Most of the trends mentioned above increase the capacity divide between regions and countries, undermining the ability of the social sciences to fulfil their role in society. The report highlights another set of divides touching on theoretical and epistemological issues and problems. Many of these issues and problems concern the meaning and limits of the internationalization of social science knowledge, and the extent to which it contributes to improving the quality and relevance of social sciences. Others concern the multiplication of disciplines and their presumed lack of collaboration, which undermine their ability to respond to today's problems.

Knowledge fragmentation: one social science? Disciplines apart? Worlds apart?

In order to fulfil their functions in the face of global challenges and to keep analysing the trends affecting human societies, the social sciences need to become more international and more inter- and trans-disciplinary than they have been. Let us develop these two aspects.

Internationalization of research

Internationalization changes the face of social science research. This involves redefining the scale on which research is carried out, and developing new ways of articulating local and global research. One obvious consequence is the increasing demand for global topics and outlooks. The production of 'global studies' on 'global issues' has grown over the past few years. In developing countries, social science research remains largely dominated by topics of local relevance that affect their immediate surroundings. This research is often written in local languages and disseminated in national books and journals. It is often invisible at international level and is insufficiently reflected in global studies. The internationalization of knowledge has confirmed the prevalence of the ideas and knowledge traditions of Northern countries over others, as well as that of English as the almost exclusive language of international research collaborations and dissemination. French, German and Spanish are still used to a lesser extent. Paradoxically, many universal or global studies are in fact very local, relying almost exclusively on the observation of one or a few similar societies, and quote works in only one or two languages. To improve their ability to address global and local issues, social sciences need to become genuinely international.

This criticism of the North Atlantic hegemony is a thread throughout the pages of this Report, and is a common feature of many fora on the issue. Challenges come from very different parts of the world, including the global North itself. They focus on the topics and language favoured in international peer-reviewed journals. Even when regional social science production meets the quality requirements of international research, it usually fails to influence international debates and discussions when it takes the form of local studies written in a language not widely spoken in international networks, or when it concerns countries and topics not well represented in bibliographical databases.

Contesting the hegemonies of topics and models in social science production is one thing, but providing actual alternatives is another. Alternative global theories and frameworks ought to be developed on the basis of broader comparative analyses which encompass more diverse regions than is usually done, and ought to be formulated in ways that allow generalizations. Greater institutionalization of mechanisms to ensure research quality would also contribute to making alternative research more visible.

Criticisms of the North Atlantic hegemony should eventually become more visible in the social science production of the global North, even though many of them originate from there. 'Global' studies might then become much more international than they are, paying more attention to the variety of local situations. Social scientists who want to study the functioning of foreign societies would be well advised to learn their languages, and to incorporate local traditions and the local production of social science knowledge in their analyses.

Another way of improving the quality of international social sciences is to favour collaboration through research networks and communities. They can help bridge the theoretical-epistemological divides, especially if more collaborations are developed between local networks in the 'peripheries' and in the North Atlantic 'centre'. 'Glocal' collaborations between different peripheries are another channel for overcoming the limitations of international social science.

Despite the potential of collaboration, past efforts have shown that networks have not always been strong enough to reverse the effects of unequal resources; nor has pluralistic thinking been strong enough to reverse existing hegemonies. Better communications do not necessarily mean more diversity of viewpoints.

Inter- and trans-disciplinary research

There are divisions between national traditions of knowledge, and also between and within disciplines. These divides are essential for the renewal of knowledge and the creativity of social scientists.

One effect of the recent evolution of disciplinary boundaries is the multiplication of subdisciplines and hyperspecial-

ization. Some universities try to counterbalance these trends and their effect on the education of undergraduate students by setting up liberal arts colleges and professional schools. However, these play only a minor role in research, for which interdisciplinary centres have been developed. Social scientists and research institutions are already testing new forms of knowledge organization, often around specific topics, and are likely to continue doing so. The desire to facilitate communication between subfields has also led to the creation of new journals.

Social scientists from different disciplines are increasingly expected to work together on the same problems, especially when it comes to addressing global challenges. One of the difficulties to achieve this concerns the development and support of centres and institutes open to cooperation between the social and natural sciences. There are however many obstacles to such collaboration. To start with, inter- and trans-disciplinary work often does not place all disciplines on an equal footing. Other obstacles relate to funding structures, systems of evaluation and promotion, methodological approaches, and pedagogical issues concerning interdisciplinary training. Many of these remain discipline-specific. Often the challenge is not merely for those in the different disciplines to work together, but more fundamentally for degree programmes at undergraduate and postgraduate levels to adopt multi-method approaches to research, training and knowledge-seeking. Unless countries and universities address these obstacles, inter- and trans-disciplinary collaborations are likely to remain wishful thinking.

Knowledge gaps on the state of the social sciences worldwide

The report highlights an extended range of important issues and trends in the organization of social sciences worldwide. It brings together a wealth of new knowledge and data on areas not well covered in the international literature, thanks to the strong commitment of the authors to provide the latest and most reliable data available. But as a clearer picture of the state of the social sciences emerges, so do the limits of our knowledge. The authors repeatedly notice the scarcity and deficiencies of available data on social scientists and their activities. Most research in science studies does not adequately discuss aspects specific to the social sciences. The study in Annex 1 summarizes the state of accessible international data on social sciences, and emphasizes the incomparability of data on the number of researchers between countries and regions, and over time. This makes it difficult to show how fast social science teaching and research have progressed in the world in the past ten years. The annex again stresses how little social science knowledge the social sciences have about themselves. A stronger focus of science studies on the social sciences could be helpful in overcoming these gaps.

Several areas that have been covered in this Report require more research. Amongst the most important areas, the following need to be stressed:

- the major themes analysed by social sciences in different regions, and the extent of the internationalization of the research content;
- major changes affecting institutions on which social science depends, such as the growth of the for-profit sector in research, the expansion in the number of think-tanks and NGOs, and the transformation of institutions supporting scholarly communication;
- the extent of institutionalization of social science in public and private organizations, such as ministries of finance and advertising companies;
- the penetration of social science terminology, perspectives and theories in the media and public discourse;
- the extent and characteristics of social science teaching at secondary level and the role of the social science textbook industry in legitimizing and transmitting knowledge to new generations of students;
- the effects of language hegemonies, and ways of promoting linguistic diversity;
- the impact of digitization and large databases on the nature and type of research produced;

- the prerequisites for research networks to function well, assessing the success and failures of previous attempts to overcome divides.

Authors have used national statistics to describe the state of social sciences in their country or region, but these statistics are often not comparable between countries. Comparable data on the following would be useful to better portray international trends in the state and production of social sciences: the number of full-time social scientists and students in the different disciplines at the different levels; the kind of institutions at which they work; and the amount and source of their research funding. Present statistics suggest that most professional social scientists work at universities and research institutes. However, the increasing number of trained social scientists working for agencies, organizations, NGOs, think-tanks and other non-academic research institutions is unknown.

Data on the international circulation of social scientists and ideas is grossly insufficient. On the whole, we know little of the circulation of scientists, and even less of the circulation of social scientists specifically. How many social scientists in the different disciplines are trained in foreign countries? Where do they work? What measures are taken to offer professional positions to those studying and working abroad? How do international networks impact the circulation of academic personnel and ideas?

Directions for future action

The following suggestions for future action are addressed to international bodies such as the International Social Science Council (ISSC) and UNESCO, to funding agencies at national and international levels, to governments, and to major academic institutions that are concerned with overcoming knowledge divides. They are presented in general terms which should be made specific at the regional or national levels.

The development of research capacity requires that governments, international organizations and aid agencies provide funding to support research institutions as well as individual training. The three levels of capacity – individual, organizational and systemic – all need sustained attention. Funding has to be made available for a sufficient period to produce results. Long-term rather than immediate impact is the objective. To combat the negative aspects of brain drain, programmes enhancing the circulation of ideas and social scientists should be promoted, and should include support for diasporic networks.

There are great disparities between regions, countries and institutions in terms of access to knowledge. Governments, research councils, foundations and funding agencies should provide universities and research institutions with the technology and money needed to support equal access to the most important national and international journals in social sciences. Furthermore, governments and international organizations should negotiate with major publishing groups to accelerate and extend free and open access to articles published in international peer-reviewed journals. Non-state actors, agencies, regional organizations and national governments could also increase their support for open-access, peer-reviewed journals. African Journals Online (AJOL), SCIELO, REDALYC and CLACSO in Latin America can serve as models for the development of similar and broader initiatives.

New technologies foster a variety of modes of collaboration between social scientists. Open-source technologies are likely to play a significant role in the development of research capacity in social sciences. Initiatives aiming at developing new digital tools for research, collaboration and networking in the social sciences will be of critical importance. It is suggested that governments, research councils and consortia of universities cooperate in developing open access archives for the deposit and dissemination of social science studies.

It is essential to reinforce multilingualism among social scientists, especially those in the global North. One goal is that everyone should be able to work and collaborate in their own language while understanding other languages. Translation, data treatment and circulation, and collaborative tools require specific development. International bodies and organizations may want to consider helping translation policies in social sciences. For example, studies addressing global challenges from a local perspective should be translated in order to widen the scope of public debate.

International associations, networks and communities are important for circulating ideas, disseminating knowledge and building capacity. Efforts should be made to strengthen existing structures and develop new ones. Regional and subregional networks can contribute very positively to the restructuring of the research landscape along regional lines, if they are supported by a variety of public national, international and private funding agencies. Different networks are required, with different purposes and memberships. Regional social science networks should work to transcend disciplinary, linguistic, gender, generational, regional and ideological divisions. South–South networks supported by private foundations and international organizations could go a long way to reduce disparities in the global academy.

Competitive project funding is likely to remain a dominant trend in the years to come. As shown in the Report, it has advantages. But it has disadvantages as well, such as the extreme bureaucratic procedures involved in selection and monitoring processes, and, in certain cases, the dominance of short-term funding. Selection and evaluation processes should be kept as simple as possible. In order to ensure diversity, some resources should be reserved for innovative projects which fall outside the list of priority topics identified by funding agencies. Governments should also be aware of the importance of balancing project funding with a strong basis of core funding. Social science research needs a baseline of stable funding. This allows institutions to attract and retain professors and researchers, to offer them an adequate research infrastructure, and to support innovative research.

Many of the challenges that the social sciences are asked to address require knowledge beyond the confines of single disciplines, and at times encompass the domains of the natural sciences and humanities. It is important to encourage interdisciplinary research and to institutionalize it. It has been suggested that interdisciplinary research centres should be created to improve our understanding of the social aspects of major global challenges such as environmental change. Here researchers from different disciplines could cooperate, and researchers with more than one disciplinary background could be hired. Experimental programmes in which natural scientists are educated in the social sciences and social scientists in the natural sciences would be welcome.

International digital databases are essential tools for overcoming knowledge divides between different areas of the world, and for opening up the possibilities of international research programmes. International organizations and various funding agencies should support their development.

International bodies such as UNESCO, ISSC, the Organisation for Economic Co-operation and Development (OECD) and regional organizations could usefully address the information gaps mentioned above. A working group should be set up to identify what is feasible in the relatively short term, and to identify other issues which should be dealt with at the national level.

The importance of social sciences in today's world is indisputable, yet their overall influence remains limited because of huge disparities in research capacities across countries and the fragmentation of knowledge. Much remains to be done, but on the global level the Report makes a number of suggestions on how to address these divides.

Annexes

Gymnastics class, Taipei, China
© UNESCO/D. Roger

Annexes

Annex 1 Basic statistics on the production of social sciences

Measure for measure: quantifying the social sciences

Michael Kahn

Introduction

More than half a century of effort has been devoted to the problem of quantifying national commitments to investment in research and experimental development (R&D) (Godin, 2008). The quantification of innovation is more recent, dating from the early 1990s. Such measurement and the construction of associated science, technology and innovation (STI) indicators are of interest to national authorities for monitoring and planning purposes as well as for determining international comparability. Notwithstanding this long history, such efforts face considerable difficulties – epistemological, definitional and methodological. It is the task of this paper to describe how research in the social sciences is quantified at the national level by means of standardized datasets. Comment is also provided on the quality and meaning of the data. The data are found at the end of this Annex, (Tables A to F) and cover the following:

Table A. Socio-economic data
Table B. Financing of R&D
Table C. Researchers
Table D. Student enrolments
Table E. Graduates
Table F. Scientific output

It should be noted that the data of the core tables, B to F, have been collated from different sources. At least three major actors are involved: education departments, agencies responsible for R&D surveys, and the owners of the bibliometric databases.

For purposes of international comparability, the approach to R&D measurement is 'standardized' by the methodological guidelines of the Frascati Manual (OECD, 2002), which first appeared in 1963 and is now in its sixth edition. The Organisation for Economic Co-operation and Development (OECD) operates as the de facto clearinghouse for the publication of its member and observer states' STI data (OECD, 2008). European Union (EU) law requires all member states to conduct regular standardized R&D surveys and to report the results to Eurostat, which then disseminates the aggregated information. The UNESCO Institute for Statistics (UIS) gathers STI data from UNESCO Member States by means of its own instrument, which is consistent with the OECD guidelines.

Further afield, Red de Indicadores de Ciencia y Tecnología (RICYT) is a non-governmental organization (NGO) that carries out a clearinghouse function for STI data in Latin America and the Caribbean and works in association with the UIS. In Africa, the S&T Secretariat of the African Union/ New Partnership for Africa's Development (AU/NEPAD) is driving efforts to quantify the R&D and innovation performance of the African Union members. The S&T Secretariat also follows the Frascati Manual guidelines. RICYT and AU/NEPAD collate data from national statistical agencies.

The socio-economic data (Table A) are 'unproblematic' and will not be commented upon here. Consequently, the paper begins with a consideration of research and experimental development (Tables B and C), which with its cousin, innovation, are understood as key drivers of economic growth and well-being. Tables D and E are also 'unproblematic', as they are extracts from education statistics. However, there are problems with the discipline boundaries pertaining to social sciences as opposed to the humanities. The assessment of scientific output (Table F) by counting publications is fraught with difficulties and deserves comment.

What counts as R&D?

The Frascati Manual is concerned with the inputs to R&D performance, namely finance and research personnel. National statistical agencies, or other designated parties, gather these data through a confidential questionnaire, using both census and purposive survey methods. Numerous problems of definition and scope make the collecting of R&D data a labour-intensive practice. Subsequently, a standard set of indicators is populated using the survey data.

The problems begin with the definition of R&D as 'creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications' (OECD, 2002, p. 30). This inclusive definition covers basic and applied research and experimental development across all fields of inquiry in both the natural and social sciences. Care must be taken to distinguish between 'in-house' R&D (counted) and extramural R&D (excluded).

The Manual provides extensive guidance on what counts as R&D as opposed to 'related scientific and technological activities', which are generally excluded. What counts as R&D (for example, a new computing algorithm) and what does not (for example, routine database development) is a contested area. Novelty is a critical test. Clinical trials[1] in Phases I, II and III that determine the safety, side-effects and effectiveness of new drugs are included; scientific and technical services (STS), such as testing, conducting routine surveys, preparing maps and mineral exploration, are not. Scientific and technical education and training, and scientific and technological services may be essential to the performance of R&D, but are not generally counted as R&D (see §2.2–2.4 in OECD, 2002). However, where STS are part of an R&D project, they are counted. Feasibility studies are out, but a feasibility study of a research project is in.

The origins of aggregating R&D inputs lie in industry and natural sciences laboratories. This gives rise to persistent emphasis on the natural sciences, engineering and technology – to the extent that many countries do not count social sciences R&D in their business sector surveys. Counting R&D in the social sciences is approached with caution, and there is advice that 'projects of a routine nature, in which social scientists bring established methodologies, principles and models of the social sciences to bear on a particular problem, cannot be classified as research' (OECD, 2002, p. 48). Deciding what to count as R&D often involves a value judgement.

The collection methodology divides the universe of R&D performers into different sectors, but the boundaries between these are somewhat porous. The business sector constitutes all registered private companies as well as state-owned corporations trading at market prices. However, in some countries, state-owned corporations are counted in the government and not the business sector. Higher (tertiary) education generally refers to universities, whether public or private. However, France includes its publicly funded National Centre of Scientific Research (CNRS) in the higher education sector, while academies are split across the higher education and government sectors in the Russian Federation. The government sector comprises both state laboratories and department-based research institutes. State laboratories include entities such as the Chinese Academy of Social Sciences (CASS), the Human Sciences Research Council (South Africa), the Council of Scientific and Industrial Research (CSIR) (India) and the Institut de Recherche pour le Développement (IRD) (France). Department-based research institutes are entities that carry out research within internal divisions; common examples are in the fields of agriculture, water, statistics and the environment. But there are many anomalies: as already noted, in France the CNRS is counted as part of higher education, and the Chinese Academy of Social Sciences is a government-sector academic research organization, which also has its own graduate school.

The fourth sector is that of the not-for-profit organizations (NPOs) whose boundaries are even more difficult to define with precision. It appears that some statistical agencies include state-owned enterprises within the NPO category; in other countries, foreign-headquartered NPOs are excluded from national figures. The extent of the sector is generally unknown, the novelty test is difficult to apply, and so on. Indeed, many NPOs are active in 'development' or even 'development research' and do not follow the Frascati Manual guidelines to meet their reporting requirements, which means their research efforts are not recorded in national returns.

Defining and measuring R&D in the social sciences

From the UNESCO perspective, the Fields of Science (FoS) are those as defined in the International Standard Classification of Educational Disciplines (ISCED) of 1997. The FoS were revised for the OECD and agreed upon in 2006 (OECD, 2006). The ISCED and OECD Fields of Science

1. http://clinicaltrials.gov/ct2/info/understand#Q19

are very similar, the exception being education, which is a separate ISCED field. OECD counts education as a component of social sciences. This might suggest that the matter of FoS is settled, a done deal. Not so. The placement of education, psychology and archaeology serves as an example. The US National Science Board (NSB) separates psychology from the social sciences, deems archaeology a social science, and lists education under a separate category, 'professional'. The Thomson-Reuters journal classifications place education and psychology under the social sciences and archaeology under humanities.

Consequently, there is an element of blurring across the social sciences–humanities (SSH) boundary, and attempts to split off the social sciences cleanly from the humanities are subject to classification problems. This must be borne in mind when examining the data. In some countries the social sciences are combined with the humanities; in OECD datasets, data are presented as social sciences, business and law (SSBL), which is separated from the humanities, arts and education; UNESCO often treats education as a separate category, as in the *Education for All Global Monitoring Report* (UNESCO, 2008). To make comparability even more difficult, the US NSB and the UK Higher Education Statistics Agency (HESA) follow their own FoS classification systems.

It is currently impossible to precisely separate SSH into SS and H, and the designation SSH is therefore followed (Table C).

As is implied in the data in Table C, social sciences research is often specifically excluded from business-sector R&D surveys. Therefore, besides the general problem of the under-reporting of R&D, the under-reporting of the social sciences and the humanities' contribution to R&D in the business sector lies in the design of the assigning approach. In practice therefore, the main sectors in which SSH R&D is 'found' are in higher education and government laboratories, science councils or academies, as the case may be. By default, the universe of performers of R&D in social science is well defined and thus lends itself to a census approach. Yet, as the gaps in the datasets below attest, this assumption does not work in practice. Beyond these two sectors, there may be important think-tanks in the NPO sector, and, provided their activities are countable as R&D, they should be included if possible. Government think-tanks would, of course, be counted in the government sector. However, consulting firms in the business sector may conduct social science research for clients in other sectors. Care must be taken to ensure that this activity meets the criteria to be counted as R&D, and if it is countable, that it is correctly attributed.

Indicators derived from R&D surveys

National statistics agencies carry out the collecting of R&D data from which S&T indicators are derived. Standard financial indicators include gross expenditure on R&D (GERD), business sector expenditure on R&D (BERD), higher education expenditure on R&D (HERD), government expenditure on R&D (GOVERD), the ratio of GERD to gross domestic product (GDP), namely GERD:GDP, sources of funds by sector, expenditure by type of activity (basic or applied research, and experimental development), and expenditure by FoS.

The standard indicators concerning R&D personnel include the overall headcount (HC), and full-time equivalent (FTE) split according to gender, and personnel qualifications. Some countries can tabulate FTEs against FoS, but these are exceptions (Canada and Japan) rather than the rule. Data on researcher age and nationality are also collected in some countries.

Methodological issues

In the data collection process, the structure of the questionnaire is critically important. On the one hand, the response rate and quality of responses may be enhanced if the instrument is kept concise. On the other hand, agencies conducting surveys often seek to elicit as much information as possible, since future queries of the resulting database are difficult to predict. Data redundancy is preferable to data drought.

Where information is demanded by statute, or where it forms the basis for decisions on funding, the recipient of the questionnaire obviously has an incentive to respond; on the other hand, if the eventual use of an item is not obvious, a recipient may be less inclined to invest time and effort in providing a complete return. The greyness of the definitions and boundaries means that R&D surveys are more complex than, say, health or education surveys – they involve a great deal of estimation and approximation, especially as they are retrospective. It is 'easy' to count desks or schools, or record infant deaths. In contrast, the subjects of R&D surveys are unique, whether these are firms, universities or research institutes, and the quality of their institutional information systems is crucial for generating accurate data. It is generally accepted that GERD may be compiled to an accuracy of 10 per cent to 15 per cent.

The problem of measuring R&D goes beyond disciplinary classification. As mentioned above, the first difficulty is to identify where countable R&D takes place. The second is to determine who is contributing to the work (research-

ers, technicians, support personnel), and the third is to determine their FTE on research. Once these have been ascertained, it is possible to calculate research expenditure as the sum of current and capital expenditures. The vigour and rigour with which this measurement is effected vary between countries and sectors.

Estimating the number of social science researchers

Table C provides the official information available on researcher headcounts and FTEs. It is immediately obvious that the bulk of social science researchers are reported to be in higher education. An accurate estimation of the FTE is necessary for the calculation of HERD. International experience has shown that calculating HERD is difficult. In some countries, historic factors make for an uneasy relationship between higher education institutions and the central government, so that information flows are compromised. In others, the weakness of university management information systems leads to poor-quality returns.

The fundamental driver of a good survey is the extent to which university academics are prepared to disclose exactly how they spend their time: what proportion goes to teaching, what to research, what to consulting, and what to community service. It is tedious for academics to respond in this way; university managers cannot wrench the information from reluctant staff; central administrations are not equipped to collect such data; consequently, an approximation must often suffice. Another contested matter is how to count and where to attribute the research role of graduate students. The Frascati Manual guideline is that doctoral students and postdoctoral fellows should be counted as part of the university researcher cadre. In some countries, Master's students contribute to research, but this effort would be excluded by the above restriction.

Arriving at appropriate values for university researchers and graduate research students' FTE is critical for the estimation of HERD. Some countries rely on a self-reported FTE (South Africa); in Canada, predetermined factors are applied to researchers according to their rank and the type of institution in which they work.

In general, little information is forthcoming on the way that the FTE is arrived at. In some cases, though, it is found that FTE factors are based on historic academic diary studies. Some universities simply respond that their staff are contracted to spend a fixed proportion of their time on research, which predetermines their research FTE. Full-time doctoral students may be assumed to spend 100 per cent of their time on their research, but in some countries, graduate teaching assistants do both research and teaching, so that their research FTE must be less than 100 per cent. Other countries do not bother with the FTE calculation and only tabulate headcount data (USA).

The FTE and HC of many countries' government sectors are almost identical. They are equal for France, while the UK, Japan and Argentina show FTEs above 0.9. It appears that the assumption is made that staff are employed to do research, therefore they do research. But staff rarely spend all their time on research: a researcher in an agricultural research organization will spend time in meetings, may be part of a team offering testing services, or conduct training courses for agribusiness. None of this is R&D per se. And the problems multiply when we consider staff engaged in policy-related research in government departments or research institutes. Many government departments do not report this as research, even if the employee may have recently moved from a senior academic post to join government. The work this person did in academia may have appeared in academic literature; once they are in government, however, the same work is now deemed to be 'routine' or a related scientific activity (RSA), and thus not countable as R&D. In some cases, government departments may simply not respond to a survey carried out by a sister department, unless it is the national treasury, in which case the response rate will be high.

Moving to specifics, Table C presents headcount (HC) and full-time equivalent (FTE) data on researchers in fifty-five countries by sector and subject area. It is immediately obvious how incomplete these data are, even at an aggregate level. HC data disaggregated by the main sectors are available for only 38 countries, including thirteen for which no NPO sector data are presented. Aggregate FTE data are available for 53 countries, with 6 under-reporting the business sector and 27 providing no FTE data for the NPO sector.

Accordingly, when it comes to the disaggregation of researchers into the broad fields of science, engineering and technology (SET) and SSH, the data are even sparser. The list of countries for which the SET and SSH headcount and FTE data are more or less complete is restricted to twenty-five: the Czech Republic, Hungary, Poland, Romania, the Russian Federation, Slovakia, Slovenia, Turkey, Mexico, Chinese Taipei, Japan, Singapore, Austria, Belgium, Canada, Denmark, Germany, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain and Sweden. Of the world's five largest spenders on R&D, only Germany and

Japan appear in this list, as the data for China, the USA and France are incomplete. The UK data are also missing.

In order to present a more complete picture, other public data sources[2] are used to provide estimates of researcher HC and FTEs for France, the UK, the USA, China and the Russian Federation (Table A1.1).

incomplete, as many countries do not provide UNESCO, Eurostat or the OECD with suitable data. The available data have been captured for the years closest to 2000 and 2006 respectively.

Table D provides ISCED 5 and 6 enrolment data for 57 countries. It is obvious that there are a number of gaps in

Table A1.1 > Calculated headcount (HC) and full-time equivalents (FTE) for SET and SSH, selected countries and years

		Business	Higher education			Government		
		SET	Total	SET	SSH	Total	SET	SSH
France	HC	107,401	100,849	70,998	29,851	31,936	27,146	4,790
(2003)	FTE	100,646	59,047	43,695	15,352	31,936	27,146	4,790
UK*	HC		241,127	139,099	102,028	9,894	8,962	932
(2006)	FTE	95,592	67,719	39,059	28,660	9,311	8,563	748
USA	HC			297,000	275,000			
(2006)	FTE			120,000	111,000			
China	HC			-	-			
(2005)	FTE			166,400	55,508			
Russian Federation	HC	221,445	30,111	26,130	3,981	139,378	126,413	13,235
(2005)	FTE	237,959	70,494	61,595	8,899	154,827	140,425	14,402

*GOV for 2005.
Notes: SET Science, engineering and technology; SSH Social sciences and humanities

By combining the data of Table A1.1 with those of Table C, we can obtain a first-pass estimate of the FTE stock of SSH researchers in some thirty countries. This yields a total FTE across the four sectors of close to 0.5 million researchers, who are predominantly (85 per cent) in higher education.

The future generation of researchers

Students are both an input to and an output of innovation systems. Tables D and E show the flow of students – the new blood for innovation systems. The tables provide data on enrolment (input) and graduation (output) in undergraduate and postgraduate programmes in the social sciences at ISCED levels 5 and 6 respectively.[3]

Of interest are the time trends, the proportion of students registered for social sciences, business and law (OECD Category 310), the proportion of female students, and the eventual Ph.D. graduates. Here, too, the datasets are

the data and in some cases information is unavailable for the 2000 and 2006 reference years. With these caveats in mind one may estimate that global tertiary level enrolment rose from around 80 million students in 2000 to 120 million in 2006, an annual compound growth rate[4] of 7 per cent. It should be noted that China accounts for some 16 million of this figure and, if excluded, the global growth rate would fall to around 6 per cent.

Partial SSBL enrolment data (OECD Category 310) 2000 and 2006 (Table D) are available for the reference years for some 51 countries, notable exceptions being Egypt, the Russian Federation, China, Indonesia, and Nigeria. (The data for India show irregularity between 2000 and 2005 and are excluded from the total). With these limitations, one finds that total enrolment in SSBL increased from around 11.4 million in 2000 to 22.0 million SSBL students in 2006, a compound annual increase of 11 per cent, higher than the growth in all tertiary enrolments. In absolute numbers, one notes a decline in six countries: Bulgaria, Chile, Austria, Belgium, Portugal and Spain. In relative terms, the picture is different: there is a decline in the

2. France: OST (2006) tables I-2-33; I-2-34; I-2-36; I-2-39 for estimation of SET:SSH ratio.
   UK: HESA (2007) tables 8 and 12 for estimation of SET:SSH ratio.
   USA: NSB (2008) tables 2-7, 5-27 for estimation of SET:SSH ratio.
3. ISCED level 5 covers the first stage of tertiary education and level 6 the second (graduate) stage.
4. UNESCO Institute for Statistics table 15 shows an increase from 76 million to 122 million.

proportion of SSBL students in 15 countries and an increase in 24. Eastern Europe shows an overwhelming increase in 9 countries compared with a decline in 2. The 4 Asia/Pacific OECD member states show modest increases, with Japan having a slight decline. Western Europe is split, with 10 up and 9 down. Regarding the gender distribution, UIS data show an overall 50 per cent male:female ratio in SSBL.

Students in SSBL made up around 30 per cent of total tertiary enrolment in 2006, with a median value of 36 per cent and a range of 36 percentage points. High outlier countries (>50 per cent) are Latvia, Romania and South Africa, while lower outliers (<25 per cent) include Canada, Cuba, Finland, Ireland, the Republic of Korea, Pakistan and Tunisia.

Next, the data on graduates (Table E) are shown. These data may be aggregated to provide estimates of the world total of SSBL graduates for the comparator years. It must be remembered that such an estimate excludes China, India, Indonesia and Canada for which full data on SSBL graduates are not at hand. With this restriction in mind, we find that there were some 2.7 million SSBL ISECD 5–6 graduates in 2000 and 4.6 million in 2006, suggesting an annual growth of 11.7 per cent over the period. The major sites of the 2006 SSBL graduate production were the USA (1.0 million), the Russian Federation (0.8 million), Japan, Brazil and Egypt (0.3 million each), United Kingdom and Poland (0.2 million). The EU27 rose from approximately 900,000 in 2000 to 1,400,000 in 2006, at a lower growth rate of 9 per cent.

Finally, there is the issue of doctoral students – the seedbed of the next generation of researchers. The available Ph.D. enrolment data (China estimated; Germany unavailable at the time of data extract) show that in 2006 (or nearest year) there was a global total of some 1.9 million doctoral students. Of these, around 850,000 or 45 percent were women. The number of Ph.D. graduates by subject area is available for 42 countries for the years of interest.

A total of 276,846 students were awarded Ph.Ds in all subjects in 2006 against an enrolment of 1,652,088, giving a crude graduation rate of 16.7 per cent.

A derived indicator of interest is the number of Ph.D. graduates per million of the population. Data are available for 41 countries, with a median value of 148.6 and ranging from Sweden (426) to Argentina (11). The higher the proportion of FTE researchers, the higher the country Ph.D. enrolments are likely to be.

Publish or perish

Collecting data on scientific publications presents problems of definition, classification and attribution. 'Publications' include articles, reviews, letters, conference proceedings, books, chapters in books and so on. The categorization of publications presents immediate problems: disciplines must be assigned to specific subject areas, journal articles span disciplines, and journal titles also span disciplines. Various disciplines exhibit varying propensities to publish, and disciplines favour different publication modes. Health sciences journals may publish articles (case notes) of half a page; historians may prefer to publish books rather than a twenty-page journal article, and so on.

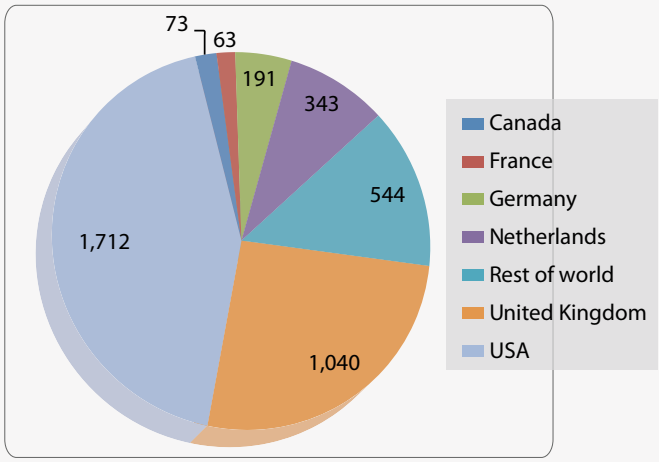
The interpretation and analysis of these data are the substance of bibliometrics. Publication counts, publication citations, and the rating of individual researchers (h-factor) are important attributes arising from the data analysis. The special character of publications in the social sciences is of critical importance to this paper.

Archambault et al. (2006) provide a review of the unique character of publications in the social sciences compared with those in the natural sciences. They address the more universalist nature of the natural sciences and the way that the universalist agenda is well served through the medium of the English language. Social science, on the other hand, whilst intrinsically universalist, is locally contextual, often addresses a local readership, and is better served by publication in local languages in local journals. Authors who work in languages other than English and wish to publish in English-language journals thus face the additional hurdle of either writing in English or paying for translation.

The standard tool for bibliometric analysis is the Thomson-Reuters set of databases, the best-known of which are those of the Web of Science,[5] namely the Science Citation Index Expanded (SCI-E), the Social Science Citation Index (SSCI), and the Arts and Humanities Citation Index (A&HCI). The Web of Science shows an inherent English-language bias when compared with other 'equivalent' databases, and Archambault et al. (2006) thus advise that when country comparisons are made, they should draw on more than one database. Consequently, we draw on the Web of Science and Elsevier Scopus.[6] Thomson-Reuters has quite naturally taken account of the language bias problem,[7]

5. http://www.isiwebofknowledge.com/
6. http://www.scopus.com/scopus/home.url
7. http://thomsonreuters.com/products_services/science/free/essays/regional_content_expansion_wos/

Figure A1.1 — Geographic distribution of journals indexed to Scopus social sciences, 2009



and since 2006 has significantly increased its coverage of social science journals beyond its English-language core. It must be borne in mind that such increases in coverage may introduce distortions in the time series.

Scopus also shows English-language bias. This is immediately obvious from Figure A1.1, which shows the geographic distribution of the social sciences journals that it indexes.

The SSCI captures some 2,800 journal titles, while Scopus Social Sciences covers close to 4,000. The combined Scopus subject areas of 'Social Sciences', 'Economics, Econometrics and Finance', 'Business, Management and Accounting' and 'Psychology' overlap somewhat with the SSCI; Scopus 'Arts and Humanities' is thought to closely match the A&HCI. This is the best that can be done without a journal-by-journal match across the databases.

The most obvious observation to be made of Table F is that publication data are available for many more countries than is the case for financial or personnel data. There are many reasons for this, especially for countries with relatively underdeveloped science systems, where national scientists working abroad and temporarily operating from local institutions may be driving the locally credited publication output. Another reason may be the self-interest of science professionals (publish or perish), which is independent of the action of local statistical agencies.

It is obvious from the Web of Science database that natural sciences articles vastly outnumber those on SSH, and given the disparity in the number of FTE researchers between the two, they should. The number of article counts recorded on SCI-E is eight times larger than that for SSCI and A&HCI combined.

The second observation is that there is a concentration by country. The five largest producers for the SCI-E are the USA (21.9 per cent), China (6.6 per cent), Japan (6.5 per cent), Germany (6.4 per cent) and the UK (5.5 per cent), which together account for approximately 47 pe cent of world production (double counting notwithstanding). The appearance of Chinese publications over the last decade is noteworthy.

Regarding the concentration of publications listed on the SSCI and A&HCI, two features stand out: first, a higher degree of geographic concentration, and second, that both China and Japan have very low numbers. The five largest volumes on the SSCI are the USA (38.9 per cent), the UK (12.1 per cent), Canada (5.6 per cent), Germany (4.4 per cent) and Australia (4.0 per cent). For the A&HCI, the list reads: the USA (41.1 pe cent), the UK (13.5 per cent), Canada (6.0 pe cent), France (5.7 per cent), and Germany (5.2 per cent). By comparison, the social sciences data from Scopus are ranked in the order: the USA (30.2 per cent), the UK (13.4 per cent), Canada (5.6 per cent), China (5.1 per cent) and Germany (4.6 per cent). For Scopus Arts and Humanities, the list reads: the USA (31.5 per cent), the UK (16.5 per cent), Canada (5.4 per cent), Germany (5.0 per cent) and France (4.5 per cent). Australia is in sixth place at 3.3 per cent.

The country rank ordering between the Web of Science and Scopus is remarkably consistent, with the exception of China.

According to the Web of Science SCI-E, SSCI and A&HCI databases for the listed countries, journal article production stands at 889,895, 101,804 and 17,675 respectively for a world total of some 1,1 million. For SCI-E citations North America and Western Europe account for 64 per cent, Asia and the Pacific 24 per cent, and other regions 12 per cent. For the SSCI, the proportions are more skewed at 85 per cent, 12 per cent and 5 per cent, while, for the A&HCI, the figures are 87 per cent, 7 per cent and 6 per cent respectively.

On the SCOPUS databases, the distribution for social science is 75 per cent, 17 per cent and 8 per cent respectively, and for Arts and Humanities 80 per cent, 11 per cent and 9 per cent. It appears that the SCOPUS database indexes journals that are more popular with authors outside North America and Western Europe.

Toward improving the measurement of R&D in the social sciences

The measurement of the inputs to and outputs from R&D is problematic in all countries; the systematic revisions of the Frascati Manual are evidence of a constant effort to improve the situation. But there is no absolutely standardized process for data collection, which means that it is addressed in varying ways according to the desire for accuracy, the resources available to those tasked with generating the data, the willingness of the respondents to engage and the perceived legitimacy of the survey process. Ultimately, the data are as reliable as the responsible national agency declares them to be. If the data are designated as official statistics, they have to be accepted as such. The comparability of the statistics per category is another matter.

It may be noted that since mid-2007 UNESCO-UIS has been developing guidelines for improving the measurement of R&D in developing countries. These guidelines may well have applicability in all countries irrespective of their development status, and apply to all fields of science, including social sciences.

The least complete datasets are those concerned with R&D personnel, which in turn determine the estimation of the inputs to R&D activity in both SET and SSH. This area could therefore be the main leverage point for improvement.

At the outset, it will be important that statistical agencies gather their data according to a common definition of what constitutes the social sciences, and what should be regarded as humanities. Nevertheless, the rapid shifts in discipline boundaries suggest that a review of discipline boundaries may be needed every five to ten years.

Provided the political will is there, it should be possible to mobilize quite modest resources to conduct an R&D survey focusing on the social sciences where this is currently unavailable. This work might best be given to a team of leading social sciences practitioners who are well-acquainted with country activity in the field. They will know where to look and who to ask regarding 'in-house' R&D in social sciences (and possibly humanities). It is unlikely that a postal survey conducted by the national statistical agency would achieve the same result. Drawing on the knowledge of informed experts is an effective way of improving R&D surveys in any field of science.

We might reasonably expect that such a purposive survey could be achieved by personal networking through brief telephonic or e-mail communication, thereby obtaining reasonable estimates of a headcount and the FTE of researchers for the social sciences. Once the FTE is known, we could estimate the labour costs. This, combined with data on the current and capital expenditure, provides an estimate of the total expenditure on R&D. On the income side, we must then track all sources of funds, which should ideally equate with the expenditure.

The approach could be extended to the business sector by concentrating on firms that are active in services, thus yielding a rough estimate of business-sector R&D in social sciences.

Any such R&D survey of the social sciences should, of course, be endorsed by the responsible national statistical agency.

The under-reporting of social sciences R&D is to the detriment of those active in the field. This under-reporting could serve to incentivize the social sciences research community to work more closely with national statistical agencies to ensure that a more complete and accurate survey is carried out. The professional self-interest that drives researchers to monitor the correct citation of their published works could be harnessed to achieve a reliable R&D survey. Ultimately, however, it comes down to the proper institutionalization of the survey, including the allocation of the necessary budget and personnel. If the survey is deemed to be serious, it will be supported. Institutionalization, not lip service, is key for a thorough survey.

While it is appreciated that the quantitative, indicator-generating approach of the Frascati Manual tells only one part of the story, that part needs to be told with conviction. The quantitative story should be told and complemented with the qualitative narrative which is so well provided by evaluation methodologies. In this way, the social sciences may better be appreciated for their integral contribution to social, economic and technological change.

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Table A > Socio-economic indicators, 2005

	Population	Gross national income	Gross domestic product/capita		Human Development Index
	million	PPP$ billion	PPP$ thousand	Gini coefficient	
Arab States					
Algeria	33	222	6.8	0.35	0.748
Egypt	74	329	4.4	0.34	0.716
Tunisia	10	79	7.9	0.4	0.762
Central and Eastern Europe					
Bulgaria	8	67	8.6	0.32	0.834
Czech Republic	10	205	20.1	0.26	0.897
Estonia	1.4	29	21.9	0.34	0.872
Hungary	10	171	16.9	0.28	0.877
Latvia	2	31	13.5	0.38	0.863
Lithuania	3	49	14.2	0.36	0.869
Poland	38	515	13.5	0.36	0.875
Romania	22	193	8.9	0.31	0.825
Russian Federation	143	1,523	10.6	0.41	0.806
Slovakia	5	85	15.8	0.26	0.872
Slovenia	2	44	22.2	0.24	0.923
Turkey	73	612	8.4	0.44	0.798
East, South Asia and Pacific					
Australia	20	622	32.2	0.35	0.965
China	1,305	8,610	6.6	0.47	0.762
Chinese Taipei	23	757	33.0	0.34	0.932
India	1,095	3,787	3.5	0.37	0.609
Indonesia	221	820	3.7	0.36	0.726
Japan	128	4,019	31.4	0.38	0.956
Korea (Republic of)	48	1,055	21.8	0.35	0.928
New Zealand	4	95	23.0	0.36	0.944
Singapore	4	130	29.8	0.43	0.918
Latin America and Caribbean					
Argentina	39	539	13.9	0.49	0.86
Brazil	186	1,534	8.2	0.57	0.807
Chile	16	187	11.5	0.55	0.874
Colombia	46	338	7.4	0.54	0.787
Mexico	103	1,034	10.0	0.46	0.842
Uruguay	3	34	9.8	0.45	0.859

Table A > Socio-economic indicators, 2005 (cont.)

	Population	Gross national income	Gross domestic product/capita		Human Development Index
	million	PPP$ billion	PPP$ thousand	Gini coefficient	
Venezuela	27	171	6.4	0.48	0.826
North America and Western Europe					
Austria	8	272	33.1	0.26	0.951
Belgium	10	342	32.6	0.28	0.948
Canada	32	1,040	32.2	0.32	0.967
Cyprus	0.8	23	29.2	0.29	0.912
Denmark	5	182	33.6	0.24	0.952
Finland	5	163	31.2	0.26	0.954
France	61	1,855	30.5	0.28	0.955
Germany	82	2,409	29.2	0.28	0.94
Greece	11	262	23.6	0.33	0.947
Iceland	0.3	13	42.6	0.25	0.968
Ireland	4	144	34.7	0.32	0.96
Israel	7	175	25.3	0.39	0.93
Italy	57	1,657	28.8	0.33	0.945
Luxembourg	0.5	41	85.1	0.26	0.956
Malta	0.4	10	24.2	0.28	0.894
Netherlands	16	530	32.5	0.31	0.958
Norway	5	187	40.4	0.28	0.968
Portugal	11	208	19.7	0.38	0.9
Spain	43	1,120	25.8	0.32	0.949
Sweden	9	284	31.4	0.23	0.958
Switzerland	7	276	37.1	0.34	0.955
United Kingdom	60	1,968	32.7	0.34	0.942
USA	296	12,438	42.0	0.45	0.95
Sub-Saharan Africa					
Nigeria	132	137	1.0	0.44	0.499
South Africa	45	548	12.1	0.58	0.67

Sources:
World Bank (2007), *World Development Report*; UNDP (2006), *Human Development Report*.

Table B > Expenditure on research and development, 2005

	GERD/capita PPP$/capita	GERD/GDP %	SSH/GERD %	
Arab States				
Algeria	4	0.07		U, O
Egypt	11	0.26		U, O
Tunisia[a]	65	1.03		U, O
Central and Eastern Europe				
Bulgaria	45	0.49		U, O
Czech Republic	286	1.41	5.8	O
Estonia	220	0.94		U, O
Hungary	160	0.94	14.6	O
Latvia	74	0.56		U, O
Lithuania	107	0.76		U, O
Poland	77	0.57	9.5	O
Romania	39	0.41	4.7	O
Russian Federation	126	1.07	3.0	O
Slovakia	81	0.51	9.8	O
Slovenia	336	1.46	9.0	O
Turkey	61	0.59	16.9	O
East, South Asia and Pacific				
Australia[b]	578	1.78	8.3	O
China	54	1.33	1.4	O
Chinese Taipei	638	2.45	3.1	O
India[c]	13	0.69		O, U
Indonesia[d]	1	0.05		O, U
Japan	1,007	3.32	4.6	O
Korea (Republic of)	636	2.98		O
New Zealand	290	1.16		O
Pakistan	9	0.44		U
Singapore	996	2.30		O
Latin America and Caribbean*				
Argentina	50	0.46	11.2	U, O
Brazil[e]	71	0.83		U, O
Chile[f]	77	0.67		U, O
Colombia	8	0.17		U, O
Mexico	57	0.46	18.0	O
Uruguay[g]	18	0.26		U, O
Venezuela	23	0.23		O
North America and Western Europe				
Austria[h]	830	2.44	7.8	O
Belgium	590	1.84	6.2	O
Canada	706	1.98	7.7	O
Cyprus	98	0.40		O, U

Table B > Expenditure on research and development, 2005 (cont.)

	GERD/capita PPP$/capita	GERD/GDP %	SSH/GERD %	
Denmark[i]	822	2.45	7.9	O
Finland	1,061	3.48	6.7	O
France	625	2.10		O
Germany	757	2.48	5.3	O
Greece	148	0.58		O
Iceland	990	2.77		O
Ireland	478	1.26	7.3	O
Israel	1,050	4.49	14.2	U, O
Italy	304	1.09		O
Luxembourg	1,099	1.57		O
Malta	111	0.54		O, U
Netherlands[j]	603	1.74	7.3	O, U
Norway	725	1.52	14.2	O
Portugal	161	0.81	15.5	O
Spain[k]	306	1.12	7.9	O
Sweden	1,304	3.80		O
Switzerland	1,015	2.90	2.8	O
United Kingdom	587	1.76		O
USA	1,093	2.62	5.5	O
Sub-Saharan Africa				
Mauritius	38	0.38		U, O
South Africa	78	0.92	12.4	O
Uganda	2	0.23		U

Abbreviations:
GERD Gross expenditure on research and development
HERD Higher education expenditure on research and development
SSH Social sciences and humanities

Sources:
O denotes OECD Main Science and Technology Indicators 2008–2.
U denotes Unesco Institute for Statistics
* http://www.ricyt.edu.ar

Notes:
a. Tunisia 2004
b. Australia 2004
c. India 2004
d. Indonesia 2001
e. Brazil 2004
f. Chile 2004
g. Uruguay 2006
h. Austria 2004
i. Denmark 2001
j. Netherlands HERD 2003
k. Spain 2002

Table C > Researcher headcounts (HC)

		Total			Business		
		SUM	SET	SSH	SUM	SET	SSH
Arab States							
Algeria	HC	13,805					
	FT	5,593					
Egypt	HC						
	FT						
Tunisia	HC	25,445					
	FT	14,650					
Central and Eastern Europe							
Bulgaria	HC	11,920			1,251		
	FT	9,840			1,157		
Czech Republic	HC	37,542	30,574	6,968	12,120	11,753	547
	FT	24,169	20,607	3,563	10,354	10,107	247
Estonia	HC	5,734			1,402		
	FT	3,331			883		
Hungary	HC	31,407	20,029	11,378	6,108	5,950	158
	FT	15,878	11,715	4,163	5,008	4,875	133
Latvia	HC	5,748			606		
	FT	3,282			468		
Lithuania	HC	11,918			916		
	FT	7,637			716		
Poland	HC	97,875	70,447	27,428	11,403	11,259	133
	FT	62,162	46,829	15,333	9,412	9,297	115
Romania	HC	29,608	25,449	4,159	10,644		
	FT	22,958	19,883	3,075	10,319		
Russian Federation*	HC	391,121	370,324	20,797	221,445	217,885	3,560
	FT	464,577			237,959		
Slovakia	HC	17,526	12,544	4,982	2,414	2,260	154
	FT	10,921	8,505	2,415	1,946	1,816	130
Slovenia	HC	7,644	6,168	1,476	1,858*	1,812*	46*
	FT	5,253	4,433	832	1,620*	1,576*	44*
Turkey	HC	83,190	53,605	23,505	10,952	10,742	210
	FT	39,139			9,456	9,307	149
Latin America and Caribbean							
Argentina	HC	49,050			4,715		
	FT	31,868			3,763		
Brazil	HC	143,864					
	FT	84,979			22,355		
Chile	HC	18,365			10,064		
	FT	13,427			6,724		
Colombia	HC	12,751			166		
	FT	5,632			136		
Mexico	HC	44,577	33,016	11,561	10,688	10,136	552
	FT	33,484	25,334	8,150	9,176	8,276	450

and full-time equivalents (FT) by sector, 2005

Higher education			Government			Not-for-profit			
SUM	SET	SSH	SUM	SET	SSH	SUM	SET	SSH	Source/Note
13,075			730						U
4,863			730						U
22,260			3,185						U
12,861			1,789						U
3,894			6,472			303			U
2,607			6,076			128			U
17,411	12,074	4,707	8,361	6,703	1,658	100	44	56	
7,576	5,688	1,888	6,113	4,778	1,335	127	34	93*	*National stats
3,618			622						U
1,905			474						U
19,086	9,948	9,138	6,213	4,131	2,082				
5,911	3,304	2,607	4,959	3,536	1,423				
4,368			773						U
2,224			589						U
9,124			1,878						U
5,116			1,805						U
72,261	46,111	25,795	14,094	12,750	1,344	117	27*	90	*National stats
40,449	26,525	13,924	12,175	10,956	1,219		51	76	
11,492	9,879	1,613	7,267	4,744	2,523	205	182	23	
5,386	4,772	614	7,082	4,644	2,438	171	148	23	
30,111	26,130	3,981	139,378	126,413	13,235	187	166	21	*Headcount for full-time staff only
70,494			154,827			1,298			
12,249	8,105	4,144	2,845	2,162	683	18	17	1	
6,458	4,751	1,707	2,503	1,926	577	14	13	1	
3,564	2,514	1,050	1,846	1,448	398	31	26	5	*2002
1,695	1,305	390	1,591	1,198	393	31	26	5	*2002
67,504	43,592	23,912	4,734	4,670	64				
25,434	16,541	8,893	4,249						
29,237			14,074			1,024			U
14,200			13,285			620			U
									U 2004
56,008			5,625			991			U 2004
6,820			615			866			U 2004
5,222			615			866			U 2004
11,275			589			727			U 2004
4,442			480			461			
24,183	14,599	9,584	7,217	6,666	551	2,483	1,615	874	2003
16,791	10,137	6,654	6,376	5,889	487	1,591	1,032	559	2002

Table C > Researcher headcounts (HC)

		Total			Business		
		SUM	SET	SSH	SUM	SET	SSH
Uruguay	HC	3,839					
	FT	1,242			12		
Venezuela	HC	4,626					
	FT	2,301			39		
East, South Asia and Pacific							
Australia	HC						
	FT	73,173			20,541		
China	HC						
	FT	1,118,698			696,413		
Chinese Taipei	HC	115,954	102,929	13,024	56,900	55,619	1,281
	FT	88,859	82,284	6,575	51,202	50,142	1,060
India	HC						
	FT	115,936			34,724		
Indonesia	HC						
	FT	42,722			253		
Japan	HC	861,901	737,648	99,935	519,360	514,713	4,647
	FT	705,659			481,496		
Korea (Republic of)	HC	224,702			154,306		
	FT	179,812			137,706		
New Zealand	HC	27,570			7,356		
	FT	17,235			3,690		
Singapore	HC	27,969	25,846	2,123	15,964	14,431	1,533
	FT	23,789	21,919	1,871	14,238	12,820	1,418
North America and Western Europe							
Austria	HC	44,127			20,587		
	FT	33,146					
Belgium	HC	48,757			20,850*		
	FT	33,146			17,991*		
Canada	HC						
	FT	125,300	105,870	19,460		76,280	
Cyprus	HC	1,424			317		
	FT	612			130		
Denmark	HC	29,791			12,281*		
	FT	19,453			9,651*		
Finland	HC	50,773			26,122		
	FT	39,130			21,967		
France	HC	251,599					
	FT	202,507			106,387		
Germany	HC	397,130*			175,040		
	FT	264,385*			157,836*		
Greece	HC	26,340			4,375		
	FT	14,371			3,797		

and full-time equivalents (FT) by sector, 2005 (cont.)

Higher education			Government			Not-for-profit			
SUM	SET	SSH	SUM	SET	SSH	SUM	SET	SSH	Source/Note
									U 2002
1,064			166						U 2002
									RICYT
1,748			514						RICYT
42,779	25,462	17,317	8,036				1,812	94	2002
221,908			168,774	161,885	6,889				
41,958	31,160	10,798	16,171	15,384	767	944	766	178	
23,180	18,425	4,755	13,790	13,152	638	687	565	122	
22,100			59,112						U 2000
26,138			16,331						U 2001
271,158	179,865	91,293	36,675	34,060	2,615	10,390	9,010	1,380	
181,214	127,918	53,296	34,035	32,290	1,745	8,924	7,894	1,030	
64,895			13,465			2,036			Excludes SSH
27,416			12,791			1,899			Excludes SSH
18,087			2,127						
11,731			1,812						U 2005
9,991	9,443	548	2,014	1,972	42				High NEC
8,187	7,739	448	1,365	1,360	5				High NEC
20,888	14,531	6,357	2,315	1,122	1,193	337	135	202	
8,280	6,130	2,150	1,030	470	560	134	75	62	
			2,511	2,063	448	260	255	5	*2001
13,853	9,918	3,935	2,273	1,881	392	250	247	3	
41,380	22,500	18,880	7,210	6,630	580		460		
807			222			78			U 2005
375			107						U 2005
15,682	10,403	5,279	2,834	2,142	692	410	400	10	*2001 Graduates assumed as researchers
8,242	5,593	2,649	2,104	1,666	438	208	203	5	*2001 Graduates assumed as researchers
18,495			5,622			534			MSTI 2007-2
12,879			3,772						MSTI 2007-2
66,290			25,889						
180,514	124,836	55,318	44,898	38,315	6,583				*U 2003
70,844	50,434	20,410	39,911	34,365	5,546				*2001
18,998			2,868			99			2001
8,544			1,980			50			2001

Table C > Researcher headcounts (HC)

		Total			Business		
		SUM	SET	SSH	SUM	SET	SSH
Iceland	HC	3,231			1,211		
	FT	1,859			853		
Ireland	HC	17,194			6,937*		
	FT	8,949*			5,971*		
Italy	HC	100,442*			29,360*		
	FT	66,702*			26,550*		
Luxembourg	HC	2,443*			1,807*		
	FT	2,091*			1,532*		
Malta	HC	972			262		
	FT	442			189		
Netherlands	HC				28,313		
	FT	45,517	40,501	4,366	22,414		
Norway	HC	36,888	27,619	9,269	14,369	14,327	42*
	FT	21,693	17,690	3,963	10,692	10,574	118
Portugal	HC	37,769	26,080	9,712	6,186	3,967	242
	FT	21,126	15,266	4,490	4,014	2,515	129
Spain	HC	181,023	136,010	44,653	43,627		
	FT	109,720	86,207	23,512	35,033		
Sweden	HC	82,496			42,476		
	FT	55,090			36,697		
Switzerland	HC	44,230			17,450		
	FT	26,105			16,275		
United Kingdom	HC						
	FT	174,559			93,717		
USA	HC						
	FT	1,387,882*			1,097,700		
Sub-Saharan Africa							
Nigeria	HC						
	FT						
South Africa	HC	39,266			7,480		
	FT	17,303			5,896		

Notes:
NEC Not elsewhere classified
SET Science, engineering and technology
SSH Social sciences and humanities
HC Headcounts
FT Full time equivalent
The sum of the breakdown may not add up to the total.

Sources:
Data from OECD Research and Development Statistics 2008/1 for year 2005 unless otherwise stated
U denotes UNESCO Institute for Statistics
RICYT Table 11 from http://www.ricyt.edu.ar
MSTI 2007-2 denotes OECD Main Science and Technology Indicators 2007-2
Eurostat: http//epp.eurostat.ec.europa.eu/portal/page/portal/education/data/database
Web sites accessed mid 2009

and full-time equivalents (FT) by sector, 2005 (cont.)

Higher education			Government			Not-for-profit			
SUM	SET	SSH	SUM	SET	SSH	SUM	SET	SSH	Source/Note
1,018			678			324			2001
520	365	155	424			68	21	47	2001
9,800	6,360	3,440	457	393	64				*2001
4,390	3,150	1,240	419	362	57				*2001
69,844	44,786	25,058	18,818	16,299	2,519	5,045	3,291	1,753	*2001
46,920	34,123	12,797	14,454	12,489	1,965	2,923	2,065	858	*2001
205	121	84	431	353	78				*U
176	94	64	383	315	58				*U
676									Eurostat
225				18					Eurostat
			7,807			614			2001
15,750	11,178	4,113	6,799			554*	110	253	2001, *National stats
17,977	10,401	7,576	4,542	2,891	1,651				*National stats
7,512	4,898	2,614	3,449	2,218	1,231				
21,384	13,568	7,816	5,602	4,974	628	4,597	3,571	1,026	
10,956	7,668	3,289	3,338	2,759	578	2,819	2,325	494	High NEC
108,823	66,084	42,379	28,212	25,988	2,224	361	311	50	
54,028	32,398	21,629	20,446	18,598	1,848	213	178	35	
34,942	17,483	8,358	4,771	2,768*	2,003*		307		*Adjusted. High NEC
15,851	10,488	3,639	3,018						High NEC
26,010			770						2000
9,425			405						2000
			10,188	9,028	1,160				2001
67,719			9,311	8,387	924				
			48,187			11,800**			*Rounded total, **1999
28,879			2,664			243			U
9,235			1,974			199			

Table D > Student enrolments, by level, total, social science, business and law, and gender, 2000 and 2006

		All fields	SSBL	% SSBL	% Female	All fields	% Female	
	Level	ISCED 5-6	ISCED 5-6	ISCED 5-6	ISCED 5A	ISCED 6	ISCED 6	Source/ Note
	Year							
Arab States								
Algeria	2000	544,009			...		...	U
	2006	817,968	318,136	39	59	37,787	45	U
Egypt	1999	2,447,088				16,675		U
	2006	2,594,186			49			U
Tunisia	2000	180,044			...	10,334	...	U
	2005	325,325	57,062	18	68	22,800	55	U
Central and Eastern Europe								
Bulgaria	2000	261,321	105,198	40	57	3,091	47	E
	2006	243,464	103,395	43	54	5,153	50	E
Czech Republic	2000	253,695	59,782	24	48	15,222	35	E
	2006	338,009	93,217	28	53	22,646	38	E
Estonia	2000	53,613	21,859	41	56	1,251	55	E
	2006	68,286	26,605	39	62	1,972	54	E
Hungary	2000	307,071	114,763	37	54	4,302	42	E
	2006	438,702	182,453	42	58	7,965	47	E
Latvia	2000	91,237	42,819	47	65	1,003	52	E
	2006	131,125	71,049	54	64	1,809	60	E
Lithuania	2000	121,904	37,456	31	58	2,023	55	E
	2006	198,868	83,165	42	60	2,878	57	E
Poland	2000	1,579,571	681,454	43	58	22,239	44	E
	2006	2,145,687	877,299	41	57	32,725	49	E
Romania	2000	452,621	189,723	42	51		-	E
	2006	834,969	417,599	50	56	21,694	48	E
Russian Federation	2000		...		56	111,024	43	U
	2006	9,167,277	...		58	147,181	43	U
Slovakia	2000	135,914	34,722	26	50	7,173	38	E
	2006	197,943	56,056	28	58	10,739	43	E
Slovenia	2000	83,816	35,186	42	59		-	E
	2006	114,794	49,903	44	62	1,057	47	E
Turkey	2000	1,015,412	290,098	18	...	19,857	35	E
	2006	2,342,898	1,110,426	47	43	32,575*	39	E. *U
Latin America								
Argentina	2000	1,766,933			57	5,931	58	U
	2005	2,082,577	824,161	40	55	4,981	57	U
Brazil	2002	2,781,328	1,448,445	52	57	102,192	55	U
	2005	4,572,297	1,852,373	41	57	119,141	55	U
Chile	2000	452,177	181,879	40	48	7,705	40	U
	2006	661,142	170,129	26	52	2,753	41	U
Colombia	2001	934,085	421,184	45	53	55,911	49	U
	2006	1,314,972	563,394	43	53	1,131	34	U
Cuba	2000	158,674	...		54	1,428	53	U
	2006	681,629	163,495	24	61	4,129	43	U
Mexico	2000	1,962,763	783,409	40	49	7,911	38	U
	2006	2,446,726	968,044	40	51	13,458	41	U
Uruguay	2000	97,641	...		61		...	U
	2006	113,368	44,299	39	62		40	U
Venezuela	2000	668,109	...		60		...	U
	2006	1,381,126	...		...		...	U

Table D > Student enrolments, by level, total, social science, business and law, and gender, 2000 and 2006 (cont.)

		All fields	SSBL	% SSBL	% Female	All fields	% Female	
	Level	ISCED 5-6	ISCED 5-6	ISCED 5-6	ISCED 5A	ISCED 6	ISCED 6	Source/ Note
	Year							
East, South Asia and Pacific								
Australia	2000	845,132	277,980	33	56	27,615	47	U
	2006	1,040,153	394,673	38	55	40,417	50	U
China	2000	7,364,111	...		...	54,038	22	U
	2006	23,360,535	...		44**	167,267*	...	U.* PhD 2000 Estimates** 2003
Hong Kong (China), SAR	2000				52*		40*	U *2003
	2006	155,324	56,194	36	53	5,508	42	U
India	2000	9,404,460	5,630,412	60	38	55,019	36	U
	2005	12,852,684	...		40	84,140	40	U
Indonesia	2001	3,017,882	...		42	53,799	34	U
	2006	3,657,429	...		47	62,065*	35	U. *PhD for 2005
Japan	2000	3,982,069	1,183,013	30	37	59,007	25	E
	2006	4,084,861	1,198,169	29	41	75,028	30	E
New Zealand	2000	171,962	50,387	29	58	3,336	47	U
	2006	237,784	82,690	35	59	5,325	51	U
Pakistan	2002	385,506	...		43	8,155	31	U
	2006	820,347	150,503	18	45	10,389	27	U
Republic of Korea	2000	3,003,498	624,265	21	36	31,787	25	U
	2006	3,204,036	691,884	22	37	43,443	34	U
North America and Western Europe								
Austria	2000	261,229	115,799	44	50	24,531	42	E
	2006	253,139	88,589	35	53	16,819	46	E
Belgium	2000	355,748	119,172	34	49	2,348	35	E
	2006	394,427	108,352	28	51	7,482	41	E
Canada	2000	1,212,161	322,438*	27	58	26,221	45	*U 1999
	2004	1,326,711	335,037*	25	58	34,716	46	*U 2003
Cyprus	2000	10,414	3,673	35	77	72*	-	E. *U 2002
	2006	20,587	9,763	47	73	302	49	E
Denmark	2000	189,162	44,335	23	52	4,648	42	E
	2006	228,893	67,618	30	59	4,751	46	E
Finland	2000	270,185	62,727	23	54	19,750	47	E
	2006	308,966	69,459	23	54	22,145	52	E
France	2000	2,015,344	...		55	94,327	47	E
	2006	2,201,201	759,984	35	56	77,056	46	E
Germany	2000	2,054,800	553,346	27	45		...	E
	2006	2,289,500	627,648	27	48		...	E
Greece	2000	422,317	169,181	40	51	2,096	40	E
	2006	653,003	205,998	32	53	22,483	44	E
Iceland	2000	9,667	3,278	34	64	18	33	E
	2006	15,721	5,969	38	65	156	58	E
Ireland	2000	160,611	32,710	20	55	2,904	45	E
	2006	186,044	43,031	23	58	5,146	48	E
Israel	2000	255,891	85,921	34	58	6,647	51	U
	2006	310,014	119,923	39	55	9,715	53	U
Italy	2000	1,770,002	712,872	40	56	13,177	49	E
	2006	2,029,023	741,190	37	57	38,262	52	E

Table D > Student enrolments, by level, total, social science, business and law, and gender, 2000 and 2006 (cont.)

		All fields	SSBL	% SSBL	% Female	All fields	% Female	
	Level	ISCED 5-6	ISCED 5-6	ISCED 5-6	ISCED 5A	ISCED 6	ISCED 6	Source/ Note
	Year							
Luxembourg	2000	2,437	...		46	23	.	E
	2006	2,692	1,218	45	54*	24	52*	E. *U 2004
Malta	2000	6,315	2,182	35	53	15	7	E
	2006	8,900	3,927	44	...	64	36	E
Netherlands	2000	487,649	195,952	40	50	4,556	42	E
	2006	579,622	217,163	38	51	7,475	42	E
Norway	2000	190,943	52,338	27	60	2,125	47	E
	2006	214,711	69,918	33	60	5,047	46	E
Portugal	2000	373,745	133,011	36	56	11,680	52	E
	2006	367,312	115,808	32	55	20,512	56	E
Spain	2000	1,828,987	673,970	37	53	65,675	51	E
	2006	1,789,254	570,202	32	54	77,056	51	E
Sweden	2000	346,878	88,311	26	60	20,714	43	E
	2006	422,614	110,665	26	61	21,377	49	E
Switzerland	2000	156,879	55,999	36	44	12,933	34	U
	2006	204,999	76,022	37	49	17,324	40	E
United Kingdom	2000	2,024,138	475,195	24	53	74,242	41	E
	2006	2,336,111	630,423	27	55	94,180	45	E
USA	2000	13,202,880	...		56	293,202	42	E
	2006	17,487,475	4,779,632	27	57	388,685	52	E
Sub-Saharan Africa								U
Nigeria	1999	699,109			26*	9,262	39*	U. *2003
	2005	1,391,527			36	8,385	24	U
South Africa	2000	644,763	303,325	47	54	6,795	38	U
	2006	741,380	392,201	53	55	9,828	42	U

Notes:

SSBL denotes social science, business and law as defined by UNESCO and OECD

Sources:

E denotes Eurostat: http//epp.eurostat.ec.europa.eu/portal/page/portal/education/data/database

U denotes UNESCO Institute for Statistics

Table E > Student graduation, by level, total, social science, business and law, and gender, 2000 and 2006

	Year	ISCED 5-6 All fields	ISCED 5-6 SSBL	ISCED 5-6 % SSBL	ISCED 5-6 % F SSBL	PhD	PhD SSBL	F PhD F SSBL	PhD/ million	Source
Arab States										
Algeria	2004	91,811	47,091	51	63					U
	2006	107,515	54,285	51	62					U
Egypt	2000	291,191	248,069	85						U
	2006	396,240	322,625	81						U
Tunisia	2000	19,586								U
	2006	56,559								U
Central and Eastern Europe										
Bulgaria	2000	46,718	22,493	48	68					E
	2006	45,383	21,700	48	65	583	99	57	49	E
Czech Republic	2000	38,376	12,852	34	59					E
	2006	69,312	19,914	29	64	2,023	290	120	173	E
Estonia	2000	6,441	3,323	52	69					E
	2006	11,541	4,226	37	74	143	18	7	149	E
Hungary	2000	59,883	23,640	40	55					E
	2006	69,756	30,529	43	70	1,012	165	86	89	E
Latvia	2000	15,260	6,320	41	67					E
	2006	26,414	14,792	56	72	106	24	13	42	E
Lithuania	2000	25,241	7,431	29	67					E
	2006	43,343	17,739	41	74	326	77	52	100	E
Poland	2000	344,339	127,371	37	66					E
	2006	504,051	214,939	43	69	5,917	745	377	144	E
Romania	2000	67,940	28,215	42	59					E
	2006	174,821	84,205	48	63	3,180	619	294	122	E
Russian Federation	2000	1,190,567	...	...						U
	2006	1,870,973	847,023	45		29,850*	5,910*		209	U. *NSB
Slovakia	2000	22,699	6,301	28	57					E
	2006	40,190	11,026	27	64	1,218	202	105	171	E
Slovenia	2000	11,991	4,782	40	64					E
	2006	17,145	8,504	50	68	395	76	41	178	E
Turkey	2000	190,080	52,165	27	47					E
	2006	373,375	140,672	38	47	2,594	493	185		E
East, South Asia and Pacific										
Australia	2000	168,913	62,318	37	52					U
	2006	284,910	119,226	42	56	4,763*	569*		238	U. *NSB 2004
China	2000	1,775,999								U
	2006	5,622,795				23,446*	1,309*		18	U. *NSB 2004
Hong Kong (China), SAR	2003	40,361	13,221	33	65					U
	2006	41,080	13,450	33	64					U
India	2000									U
	2006					13,733*			13	U. *NSB 2003
Indonesia	2001	476,971								U
	2004	612,975								U
Japan	2000	1,081,435	265,069	25	32					E
	2006	1,067,939	288,599	27	39	15,979	1,686	586	132	E
New Zealand	2000	42,791	11,419	27	55					U
	2006	59,320	22,301	38	57	623*	66*		156	U. *NSB 2004

Table E > Student graduation, by level, total, social science, business and law, and gender, 2000 and 2006 (cont.)

	Year	ISCED 5-6 All fields	ISCED 5-6 SSBL	ISCED 5-6 % SSBL	ISCED 5-6 % F SSBL	PhD	PhD SSBL	F PhD F SSBL	PhD/ million	Source
Pakistan	2000									U
	2006									U
Korea (Republic of)	2000	519,719	110,035	21	48					U
	2006	605,160	120,580	20	47	7,946*	1,351*		166	U. *NSB 2004
Latin America and Caribbean										U
Argentina	1999	136,878								U
	2001	140,099	70,371	50	59	685º	161º		11	U.ºRICYT.
Brazil	2001	347,978	151,540	44	55					U
	2005	757,553	277,572	37	54	9,366º	890º		44	U.ºRICYT.
Chile	2000	53,417	26,343*							U. *2003
	2006	73,203	22,931	31	52	249º	34º		12	U.ºRICYT.
Colombia	2002	65,720	30,411	46	59					U
	2006	115,488	60,092	52	51	39º	10º			U.ºRICYT.
Cuba	2000	16,967								U
	2006	100,874	3,956	4	63	447º				U.ºRICYT.
Mexico	2000	299,146	132,372	44	55					U
	2005	380,413	165,482	44	59	2,325*	382*			U.*NSB.
Uruguay	2000	7,629								U
	2006	8,485	2,796	33	66	21º				U.ºRICYT.
Venezuela	2000	60,912	26,109	43	66					U
	2006	138,557								U
North America and Western Europe										
Austria	2000	24,981	6,892	28	50					E
	2006	34,825	10,031	29	58	2,158	684	335	306	E
Belgium	2000	68,225	20,768	30	54					E
	2006	81,567	23,060	28	58	1,718	261	99	148	E
Canada	1999	225,020	77,341	34	60					U
	2002	246,589				3,709*	657**		116	U.*NSB **OECD
Cyprus	2000	2,813	930	42	659*					E
	2006	3,858	1,687	44	61	29	7			E
Denmark	2000	39,017	9,432	24	40					E
	2006	47,539	14,463	30	52	910	125	57	158	E
Finland	2000	35,635	8,228	23	68					E
	2006	40,044	9,451	24	71	1,409	210	113	373	E
France	2000	508,189	190,844	38	63					E
	2006	643,604	267,695	42	63	9,818	1,931	931	138	E
Germany	2000	302,095	62,263	21	43					E
	2006	358,706	98,619	22	50	24,946	4,451	1,628	316	E
Greece	2001	38,963								E
	2006	64,387	16,753	28	67	1,248	94	31	118	E. PhD 2005
Iceland	2000	1,779	550	31	56					E
	2006	3,397	1,160	34	59	10			33	E
Ireland	2000	42,009	13,039	31	58					E
	2006	59,184	20,566	35	59	979	115	65	171	E
Israel	2000	62,363	20,928	34	58					U
	2004	76,726				1,135*	114*		162	U. *NSB

Table E > Student graduation, by level, total, social science, business and law, and gender, 2000 and 2006 (cont.)

	Year	ISCED 5-6 All fields	ISCED 5-6 SSBL	ISCED 5-6 % SSBL	ISCED 5-6 % F SSBL	PhD	PhD SSBL	F PhD F SSBL	PhD/ million	Source
Italy	2000	201,290	74,235	37	55					E
	2006	432,068	144,718	33	53	10,188	1,877	970	111	E
Luxembourg	2000	680	335	49						E
	2006									E
Malta	2000	2,003	816	41	39					E
	2006	2,676	1,182	44	52	1				E
Netherlands	2000	76,927	27,439	36	48					E
	2006	117,392	44,892	38	52	2,993	566	247	167	E
Norway	2000	29,935	7,717	26	51					E
	2006	33,529	9,058	27	50	882	153	64	151	E
Portugal	2000	48,533	19,022	39	74					E
	2006	71,828	23,102	32	60	1,094	196	112	360	E
Spain	2000	260,225	91,195	35	62					E
	2006	285,957	80,830	28	64	7,159	1,342	623	184	E
Sweden	2000	42,390	8,830	21	58					E
	2006	60,762	15,044	25	63	2,660	262	106	426	E
Switzerland	2000	55,970	19,792	35	35					E
	2006	56,320	27,022	48	44	3,198	566	218	422	E
United Kingdom	2000	504,081	154,957	31	55					E
	2006	640,848	195,519	31	56	16,466	2,978	1,530	254	E
USA	2000	2,150,954	877,707	41	56					E
	2006	2,639,006	1,005,047	38	56	56,067	10,912	6,221	142	E
Sub-Saharan Africa										U
Nigeria	1999	58,455			44					U
	2004	174,602			41					U
South Africa	2000	103,203	41,293	40	53					U
	2006	124,676	53,440	43	58	1,100			24	U

Notes:

SSBL denotes social science, business and law as defined by UNESCO and OECD

F Female

Sources:

NSB denotes National Science Board 'Science and Engineering Indicators 2008' Appendix Table 2-40

RICYT Table 20 from http://www.ricyt.edu.ar

E denotes Eurostat: http//epp.eurostat.ec.europa.eu/portal/page/portal/education/data/database

U denotes UNESCO Institute for Statistics

OECD denotes OECD *Education at a Glance* (2008)

Table F > Articles abstracted to the Thomson-Reuters and Scopus databases, 2007

	Thomson-Reuters			Scopus	
	SCI-E	SSCI	A&HCI	SOCSCI	ARTS
Arab States					
Algeria	870	8	1	21	2
Egypt	3,106	58	11	91	7
Tunisia	1,408	24	2	54	4
Central and Eastern Europe					
Bulgaria	1,586	33	5	83	6
Estonia	696	86	8	91	14
Hungary	3,686	172	43	309	70
Latvia	229	16	0	12	0
Lithuania	810	64	54	177	37
Poland	10,615	258	75	426	44
Romania	2,062	69	50	97	29
Russian Federation	21,717	390	114	299	78
Slovakia	1,049	108	71	159	59
Slovenia	1,833	137	39	343	20
Turkey	14,322	848	77	1,052	44
Latin America					
Argentina	4,758	136	52	232	47
Brazil	16,705	813	72	1,627	153
Chile	2,815	207	106	336	82
Colombia	889	113	9	230	16
Mexico	7,727	668	91	423	10
Uruguay	396	13	3	20	0
Venezuela	944	25	13	110	6
East, South Asia and Pacific					
Australia	22,376	4,167	523	4,540	293
China	62,063	1,980	197	5,225	261
Chinese Taipei	16,444	1,341	31	1,481	28
India	26,810	630	51	1,496	90
Indonesia	543	59	9	105	6
Japan	60,557	1,489	109	1,988	103
Korea (Republic of)	22,818	874	72	934	53
New Zealand	4,397	899	121	1,031	83
Singapore	5,449	485	44	582	31
North America and Western Europe					
Austria	7,267	525	84	614	57
Belgium	10,484	1,158	254	1,263	130
Canada	35,763	5,861	1,074	5,719	479
Cyprus	289	68	13	114	4
Czech Republic	5,116	263	86	302	25
Denmark	7,975	833	78	783	59
Finland	7,076	894	87	963	69

Table F > Articles abstracted to the Thomson-Reuters and Scopus databases, 2007 (cont.)

	Thomson-Reuters			Scopus	
	SCI-E	SSCI	A&HCI	SOCSCI	ARTS
France	42,563	2,200	1,018	2,872	396
Germany	59,628	4,678	924	4,651	438
Greece	7,320	457	84	738	65
Iceland	397	62	10	61	4
Ireland	5,045	754	146	592	48
Israel	9,615	1,371	236	1,197	131
Italy	33,355	1,758	362	2,214	181
Luxembourg	176	21	1	33	1
Malta	60	10	4	9	1
Netherlands	18,772	3,573	316	3,559	194
Norway	5,739	992	84	997	61
Portugal	4,938	289	33	463	26
Spain	27,338	2,298	518	2,519	193
Sweden	14,381	1,860	131	1,616	116
Switzerland	14,241	1,302	124	1,310	92
United Kingdom	51,844	12,749	2,426	13,732	1,450
USA*	205,320	40,877	7,367	30,874	2,770
Sub-Saharan Africa					
Nigeria	1,287	112	12	217	16
South Africa	4,226	669	150	778	84

Notes:

Thomson-Reuters:

SCI-E Science Citation Index – Expanded

SSCI Social Science Citation Index

A&HCI Arts and Humanities Citation Index

Scopus:

SOCSCI combines the subject areas of social science, business, psychology and economics

ARTS covers the subject area of arts and humanities

* USA from National Science Board 'Science and Engineering Indicators 2008' Appendix Table 5-34

Annex 2
Bibliographical databases and repositories

This annex provides a brief overview of some of the main bibliographical databases (and bibliometric indices) with relevance to the social sciences. The main aim of this annex is to give the non-expert reader a brief explanation of the differences between the databases used by the various authors in this Report.

Bibliographical databases

Bibliographical databases are indices of publications which mostly include information on the authors, title, date of publication, publisher and so on. They are used primarily to find literature. Since the late twentieth century various national and disciplinary bibliographical databases have been constructed. These databases may be accessible online, and sometimes include links to the full text of the publications.

A specific subset of bibliographical databases can be used for bibliometric analyses. These indices contain standardized data, which, besides the general bibliographical entries, include information on the number of citations the publication has received, those publications to which it refers, and the institutional addresses of the authors. This additional and standardized information allows for the evaluation of the knowledge claims contained in these databases in terms of their visibility, and indicates the number of citations they receive. By extension, the databases are used to evaluate research systems, research organizations and (in combination with peer review) individual researchers. In addition, they are used for mapping the dynamics of science systems. The bibliometric indices currently in use tend to be restricted to publications in a limited set of 'highly visible' journals. For a discussion of the limitations of the existing bibliometric indices for the evaluation of knowledge claims in the social sciences see, among others, Archambault and Larivière and other contributions in Chapter 7 of this Report.

Bibliometric databases

The two main bibliographical databases used for bibliometric analyses are Thomson Reuter's Web of Science (WoS) and Elsevier's Scopus.

The WoS includes the:

- Science Citation Index Expanded (SCI-E), which mainly, though not exclusively, contains the publications in natural and life science journals going back to 1900. The SCI Expanded contained 8,150 journals at the end of 2009.
- Social Science Citation Index (SSCI), which contains journals classified as belonging to the social sciences going back to 1956. The SSCI contained 2,759 journals at the end of 2009.
- Arts and Humanities Citation Index (A&HCI), which contains journals classified as belonging to the arts and humanities going back to 1975. The A&HCI contained 1,516 journals at the end of 2009.

There is some overlap in the coverage of these three main citation indices. Furthermore, the WoS also offers the so-called Journal Citation Reports, which provide various visibility indicators for journals in both the natural and social sciences.

In recent years, Elsevier launched a competitor to the WoS, Scopus. This index offers the analyst a similar data source and similar functionality as that offered by the WoS indices.

As with the WoS, it is also possible to restrict searches to the social sciences or subsets within that broad field. The main difference between the two databases is that the journal coverage is different. According to the information provided on its website, Scopus contains 16,500 journals. It is reported to contain 5,100 social science titles (which encompass more than just journals). The producers of both indexes are actively expanding their coverage, and the figures presented in this section may already have been surpassed. The geographical and linguistic bias of Scopus is said to be lower than that of the WoS. (Most of) Scopus references only go back to 1996 at present.

National science citation indices

Besides these international bibliometric databases, national citation indices have also been developed as of the 1990s. The most prominent examples of these are the Chinese Science Citation Indices and the Chinese Social Science Citation Indices (see also Wei in this Report). The Russian Federation is also making attempts to compile a Russian Science Citation Index (see Pipiya in this Report). In Spain, efforts have been made to establish a Spanish-language counterpart of the Thomson Reuter's WoS Journal Citation Reports in the social sciences (see Cruz and Jimenez in this Report). Considering the limited inclusion of Chinese, Russian and Spanish-language journals in the international citation indices, these different types of national citation indices may play an important role in the evaluation of research in these countries.

Disciplinary bibliographical databases

There are a large number of bibliographical databases which are restricted to journals in a specific disciplinary field. Examples of these disciplinary databases are ECONLIT, Worldwide Political Science Abstracts (WPSA), Sociological Abstracts and Psychinfo. These disciplinary bibliographical databases can also be used for output analyses. For various reasons, they are less suitable for other bibliometric analyses (see also van Raan in this Report).

Other bibliographical databases

A complete list of bibliographical databases would be very long – most libraries worldwide, for example, maintain a bibliographical database of their stocks. See, for example, Ammon (international bibliography of the social sciences) as well as Waast, Arvanitis, Richard-Waast and Rossi in this Report for potential uses of these databases for analyses of social science dynamics. In addition, there are a large number of national and disciplinary bibliographical databases which can be used to identify and retrieve literature from various sources. 'Humanindex' is an example of an institutional bibliographical database containing over 48,000 references to books, articles, presentations and catalogues in the social sciences and humanities produced by the researchers of the Universidad Nacional Autónoma de México.

Open access (journal) repositories

The open access repositories which have been set up in recent years deserve a special mention. Some of these are regionally based, such as AJOL (see Mouton in this Report) in sub-Saharan Africa, and SCIELO, REDALYC and CLACSO in Latin America (see Babini in this Report). See also Perakakis et al. (in this Report) for more information on developments in open access.

JSTOR is an example of a not-for-profit multidisciplinary journal repository which requires a library subscription. Cairn is a portal offering free access to almost 70,000 French- language journal article abstracts and old articles (full text) as well as to recent articles after payment.

Open access repositories

As mentioned in the introduction, there are also repositories containing a wide variety of textual sources. Important examples in the social sciences are, for example, Research Papers on Economics (RePEcs IDEAS), the Social Science Research Network (SSRN), and E-LIS for documents on library and information science. Besides disciplinary repositories, there are also national repositories such as the French CNRS HAL. Finally, there are institutional repositories which contain textual output from a single institution, such as the Igitur Archive Universiteit Utrecht, Universitat Politécnica de Catalunya UPCommons, the Agecon Search Research in Agricultural and Applied Economics, King Fahd University of Petroleum and Minerals ePrints, and Kyoto University Research Information Repository. Examples and visibility rankings of general repositories and institutional repositories can be found at http://repositories.webometrics.info/top400_rep_inst.asp. Apart from open access repositories, there are also services that only collect and store information for subscribers.

Journal directories

A final subset of bibliographical databases which should be mentioned here consists of the journal directories compiled by, among others, Ulrich. This Ulrich directory contains bibliographical and publisher information for more than 300,000 periodicals of all types – including academic peer-reviewed journals but also popular magazines, newspapers,

newsletters and so on. In contrast to the bibliographical and bibliometric databases discussed in this annex, these journal directories do not contain data on individual articles. While unsuitable for bibliometric analyses, they may be complementary. Several authors in this Report have made use of this directory to make statements about the geographical and linguistic biases of existing bibliometric databases (see also Archambault and Larivière as well as Gingras and Mosbah-Natanson in this Report).

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Annex 3
Supplementary figures and tables

Annex to Chapter 4

Table A4.6 > Development of inter-regional collaboration links over time

	Period	North America	Western Europe	Southern, Central and Eastern Europe and CIS	Arab States	East Asia and the Pacific	South Asia	Latin America and the Caribbean	Sub-Saharan Africa	Oceania
North America	1989–1993	x	0.607	0.330	0.089	0.313	0.160	0.215	0.154	0.219
	1994–1998	x	0.570	0.285	0.068	0.355	0.125	0.218	0.137	0.188
	1999–2003	x	0.580	0.249	0.065	0.296	0.091	0.198	0.141	0.180
	2004–2008	x	0.566	0.221	0.059	0.306	0.092	0.191	0.127	0.152
Western Europe	1989–1993	0.607	x	0.098	0.047	0.070	0.060	0.059	0.067	0.146
	1994–1998	0.570	x	0.192	0.049	0.087	0.057	0.081	0.110	0.163
	1999–2003	0.580	x	0.203	0.058	0.123	0.075	0.102	0.147	0.181
	2004–2008	0.566	x	0.215	0.064	0.147	0.085	0.125	0.139	0.202
Southern, Central and Eastern Europe and CIS	1989–1993	0.330	0.098	x	0.000	0.013	0.013	0.007	0.000	0.021
	1994–1998	0.285	0.192	x	0.009	0.018	0.004	0.006	0.004	0.020
	1999–2003	0.249	0.203	x	0.011	0.018	0.008	0.006	0.008	0.017
	2004–2008	0.221	0.215	x	0.012	0.016	0.015	0.009	0.006	0.024
Arab States	1989–1993	0.089	0.047	0.000	x	0.000	0.008	0.007	0.014	0.005
	1994–1998	0.068	0.049	0.009	x	0.003	0.000	0.000	0.011	0.007
	1999–2003	0.065	0.058	0.011	x	0.014	0.017	0.017	0.011	0.008
	2004–2008	0.059	0.064	0.012	x	0.003	0.019	0.010	0.010	0.021
East Asia and the Pacific	1989–1993	0.313	0.070	0.013	0.000	x	0.027	0.002	0.116	0.071
	1994–1998	0.355	0.087	0.018	0.003	x	0.028	0.010	0.039	0.095
	1999–2003	0.296	0.123	0.018	0.014	x	0.030	0.014	0.032	0.107
	2004–2008	0.306	0.147	0.016	0.003	x	0.047	0.012	0.027	0.124

Table A4.6 > Development of inter-regional collaboration links over time (cont.)

	Period	North America	Western Europe	Southern, Central and Eastern Europe and CIS	Arab States	East Asia and the Pacific	South Asia	Latin America and the Caribbean	Sub-Saharan Africa	Oceania
South Asia	1989–1993	0.160	0.060	0.013	0.008	0.027	X	0.008	0.016	0.028
	1994–1998	0.125	0.057	0.004	0.000	0.028	X	0.019	0.015	0.027
	1999–2003	0.091	0.075	0.008	0.017	0.030	X	0.014	0.021	0.039
	2004–2008	0.092	0.085	0.015	0.019	0.047	X	0.016	0.018	0.014
Latin America and the Caribbean	1989–1993	0.215	0.059	0.007	0.007	0.002	0.008	x	0.014	0.015
	1994–1998	0.218	0.081	0.006	0.000	0.010	0.019	x	0.015	0.011
	1999–2003	0.198	0.102	0.006	0.017	0.014	0.014	x	0.019	0.010
	2004–2008	0.191	0.125	0.009	0.010	0.012	0.016	x	0.022	0.029
Sub–Saharan Africa	1989–1993	0.154	0.067	0.000	0.014	0.116	0.016	0.014	x	0.022
	1994–1998	0.137	0.110	0.004	0.011	0.039	0.015	0.015	x	0.021
	1999–2003	0.141	0.147	0.008	0.011	0.032	0.021	0.019	x	0.031
	2004–2008	0.127	0.139	0.006	0.010	0.027	0.018	0.022	x	0.034
Oceania	1989–1993	0.219	0.146	0.021	0.005	0.071	0.028	0.015	0.022	x
	1994–1998	0.188	0.163	0.020	0.007	0.095	0.027	0.011	0.021	x
	1999–2003	0.180	0.181	0.017	0.008	0.107	0.039	0.010	0.031	x
	2004–2008	0.152	0.202	0.024	0.021	0.124	0.014	0.029	0.034	x

Table A4.7 > Countries by region

1	North America	Canada , USA
2	Western Europe	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Wales, England, Scotland, Northern Ireland
3	Southern, Central and Eastern Europe and CIS	Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Cyprus, Czech Republic, Estonia, Georgia, Hungary, Israel, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Montenegro, Poland, Republic of Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia, The former Yugoslav Republic of Macedonia, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan
4	Arab States	Algeria, Bahrain, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Morocco, Oman, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates, Yemen
5	East Asia and the Pacific	Brunei Darussalam, Cambodia, China, Fiji, Hong Kong (China) SAR, Indonesia, Japan, Kiribati, Lao People's Democratic Republic, Malaysia, Marshall Islands, Micronesia, Mongolia, Myanmar, Nauru, Palau, Papua New Guinea, Philippines, Republic of Korea, Samoa, Singapore, Solomon Islands, Thailand, Tonga, Tuvalu, Vanuatu, Viet Nam
6	South Asia	Afghanistan, Bangladesh, Bhutan, India, Islamic Republic of Iran, Maldives, Nepal, Pakistan, Sri Lanka
7	Latin America and the Caribbean	Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela
8	Sub-Saharan Africa	Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, South Africa, Swaziland, Togo, United Republic of Tanzania, Uganda, Zambia, Zimbabwe
9	Oceania	Australia, New Zealand

Annex to Chapter 5

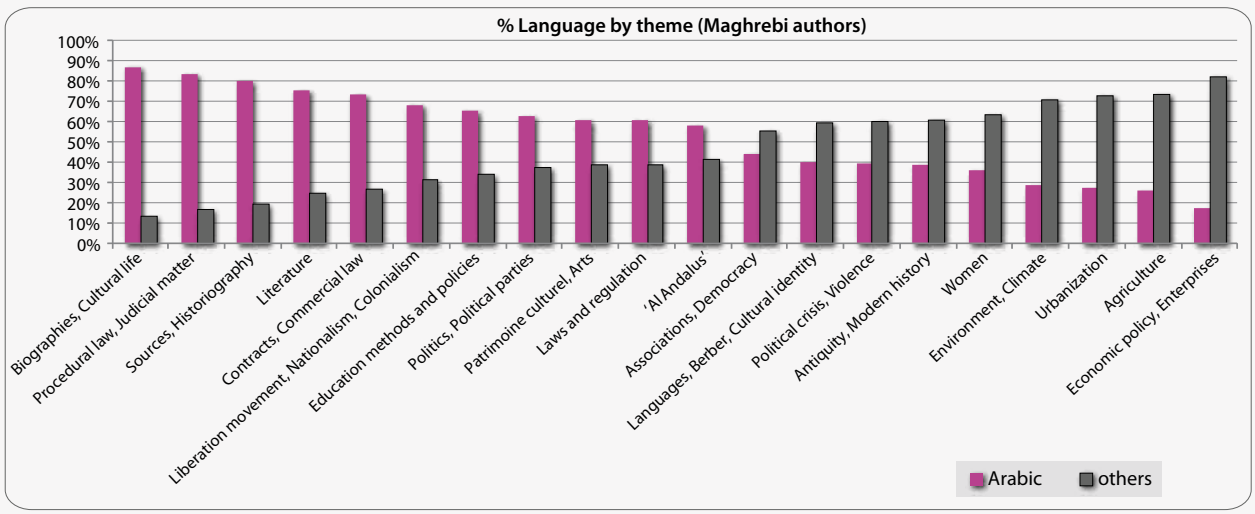
Table A5.2 > Evolution (emergence and decline) of the main scientific themes in the social sciences in the Maghreb

Themes	1980–1986	1987–1992	1993–1998	1999–2004
Procedure, judicial precedents	-8,5	-8,8	-6,4	18,7
Contracts, Corporate law	-2,4	0,0	-4,0	5,1
Literature, Arts and civilization, Poetry	-5,5	-3,0	-6,4	12,0
Laws and regulations	-2,0	-5,0	0,0	5,0
New themes**	-8,0	-3,0	0,0	9,0
Politics, political parties	-4,5	-3,2	0,0	7,4
Political crisis, Islam in politics	-8,7	-2,9	3,5	5,0
Languages, Berber, Cultural identity	-7,9	-4,6	0,0	7,9
Cultural heritage	-6,0	0,0	-3,0	7,0
Environment, Climate	-6,0	0,0	8,0	-4,0
Sources, Historiography	-3,0	0,0	5,0	0,0
Women, Women's condition	-3,5	3,4	3,4	-3,3
Economic policy, Enterprises	0,0	5,2	11,0	-14,2
Urbanization	0,0	4,2	0,0	-3,3
'Al Andalus'	0,0	6,6	0,0	-4,4
Antiquity, Modern history	5,6	7,3	-5,1	-14,4
Liberation movements, Nationalism	5,7	0,0	0,0	-4,6
Agriculture	7,2	3,6	5,3	-12,7
Education methods and policies	0,0	0,0	0,0	2,4
Biographies, Cultural life	0,0	0,0	0,0	0,0

Notes: Figures in the table represent a v-test of a theme which measures whether the theme is over-represented (v > 0), under-represented (v < 0) or normally represented (v = 0) in the corpus during a period of time. We highlighted, for each theme: in yellow, its emergence (v becomes > 0), in green, its apex (v is maximum), in orange its slowdown (v decreases) and in red its regression.

** New themes that appeared in the last period and thus have no precedent: Associations and democracy; Local development; Communication and media; Human rights.

Figure A5.4 — Language and themes in the social sciences in the Maghreb, 1985–2004



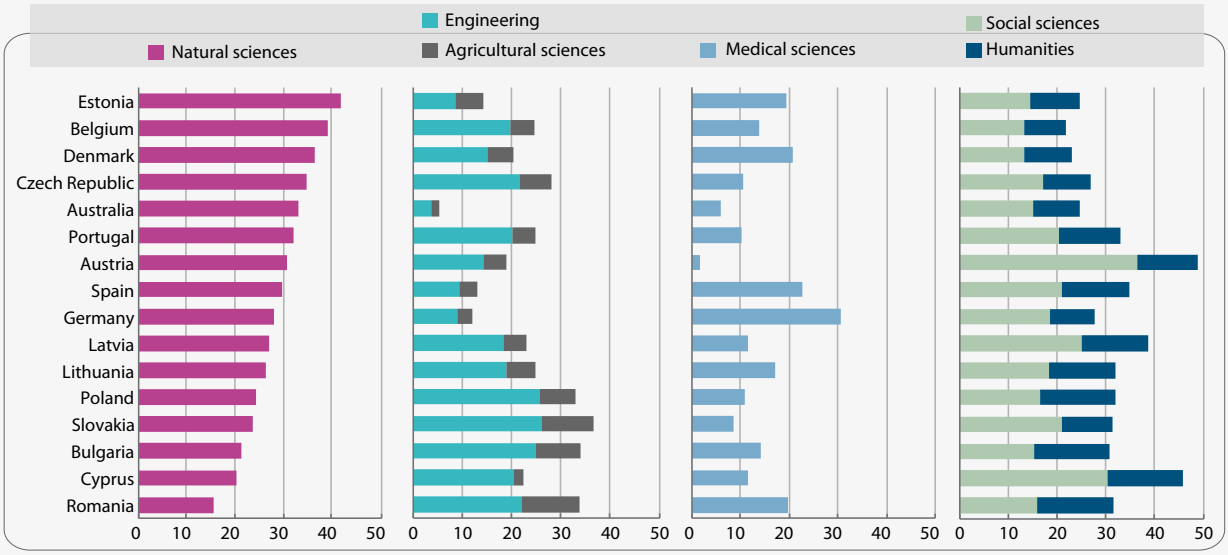
Annex to Chapter 8

Table A8.3 > Median age at graduation of doctorate holders having

		ARG	AUS	AUT	BEL	BGR	CHE	CYP	CZE	DNK	ESP
Natural sciences	Women		31.0	30.4	28.0	34.0	30.0	29.0	36.0	31.8	29.0
	Men		31.0	31.4	28.0	35.0	30.0	28.0	38.0	30.9	30.0
	Total	**34.0**	**30.0**	**31.1**	**28.0**	**35.0**	**30.0**	**29.0**	**39.5**	**31.1**	**30.0**
Engineering	Women		31.0	30.9	29.0	34.0	30.0	0.0	33.5	31.7	31.0
	Men		31.0	32.5	28.0	45.0	31.0	28.0	40.0	31.1	32.0
	Total	**33.0**	**31.0**	**32.4**	**28.0**	**44.0**	**31.0**	**28.0**	**39.5**	**31.2**	**32.0**
Medical sciences	Women		35.0	27.8	28.0	42.0	30.0	37.0	37.0	36.2	33.0
	Men		35.0	32.7	30.0	44.0	32.0	34.0	38.5	34.7	34.0
	Total	**33.0**	**35.0**	**28.8**	**29.0**	**43.0**	**31.0**	**36.0**	**40.0**	**35.2**	**33.0**
Agricultural sciences	Women		34.0	30.8	31.0	30.0	29.0		32.0	33.9	30.0
	Men		34.0	29.6	29.0	39.0	31.0		35.0	33.8	33.0
	Total		**33.0**	**30.1**	**30.0**	**34.0**	**30.0**		**35.5**	**33.9**	**31.0**
Social sciences	Women		41.0	28.4	30.0	35.0	0.0	31.0	37.5	34.2	35.0
	Men		41.0	30.5	33.0	37.0	0.0	42.0	40.0	33.3	37.0
	Total	**34.0**	**41.0**	**30.1**	**31.0**	**37.0**	**0.0**	**37.0**	**41.5**	**34.0**	**36.0**
Humanities	Women		40.0	33.8	29.0	39.0	36.5	36.0	37.5	38.5	36.0
	Men		40.0	39.7	31.0	37.0	36.0	40.0	35.0	35.8	38.0
	Total	**34.0**	**40.0**	**33.8**	**30.0**	**39.0**	**36.0**	**39.0**	**37.5**	**36.8**	**37.0**
All fields	Women		34.0	30.3	29.0	35.0	31.0	31.0	36.5	34.1	31.0
	Men		34.0	31.5	29.0	40.1	31.0	33.0	38.3	32.4	33.0
	Total	**34.0**	**34.0**	**31.1**	**29.0**	**38.0**	**31.0**	**32.0**	**39.5**	**33.1**	**32.0**

Sources: OECD, 2009, OECD/UNESCO Institute for Statistics/Eurostat data collection on careers of doctorate holders.

Figure A8.5 — Distribution of 1990–2006 doctoral graduates over main fields of science (selected OECD countries), 2006



received their degree between January 2005 and December 2006 (selected OECD countries)

EST	FIN	ISL	JPN	LTU	LTV	NOR	POL	PRT	ROM	SVK	SWE	USA
36.0	32.0	31.0	28.0	31.0	32.0	32.0	31.0	33.0	34.0	29.0	32.0	30.2
32.0	32.0	31.0	30.0	32.0	33.0	31.5	30.0	34.0	36.0	31.0	32.0	30.7
30.0	**32.0**	**31.0**		**31.0**	**32.0**	**31.7**	**30.0**	**34.0**	**35.0**	**31.0**	**32.0**	**30.5**
37.0	34.0		33.5	31.0	32.0	30.7	32.0	34.0	38.0	30.0	32.0	30.2
32.0	33.0		34.0	29.0	32.0	31.1	32.0	36.0	43.0	30.0	32.0	31.0
34.5	**33.0**			**30.0**	**42.0**	**31.0**	**32.0**	**36.0**	**40.0**	**30.0**	**32.0**	**30.8**
38.0	38.0	32.0	33.5	35.0		38.5	33.0	39.0	39.0	39.5	37.0	37.2
31.0	36.0	42.0	32.0	38.0		38.3	33.0	42.0	42.0	34.0	38.0	34.6
32.5	**37.0**	**33.0**		**37.0**		**38.4**	**33.0**	**42.0**	**40.0**	**37.0**	**37.0**	**36.1**
49.0	35.0		32.5	32.0		33.2	30.0	37.0	36.0	33.0	33.0	33.1
48.0	39.0		33.5	32.0		36.1	31.5	38.0	38.0	29.0	36.0	33.4
32.0	**35.0**			**32.0**		**34.3**	**31.0**	**38.0**	**37.0**	**31.0**	**34.5**	**33.2**
33.0	40.0	35.0	32.0	30.0	42.0	40.2	31.0	40.0	34.0	30.0	37.5	36.1
35.0	40.0	38.0	35.0	29.0		39.0	31.0	40.0	39.0	29.0	37.0	35.9
31.0	**40.0**	**36.5**		**29.0**	**35.0**	**39.4**	**31.0**	**40.0**	**36.0**	**30.0**	**37.0**	**36.0**
34.0	41.0		44.0	34.0		37.9	31.0	42.0	40.0	34.0	39.0	34.7
33.0	41.0		34.5	31.0		38.4	31.5	44.0	42.0	31.0	38.0	35.3
37.5	**41.0**			**34.0**	**35.0**	**38.2**	**31.0**	**42.0**	**41.0**	**31.5**	**39.0**	**35.0**
37.0	37.0	34.0	33.0		37.0	36.0	31.0	38.0	37.0	31.0	34.0	33.2
32.0	35.0	32.5	32.0		33.0	34.4	31.0	38.0	39.0	31.0	33.0	32.4
33.0	**36.0**	**33.0**			**33.0**	**35.0**	**31.0**	**38.0**	**38.0**	**31.0**	**33.0**	**32.7**

Table A8.4 > Breakdown of 1990–2006 employed

	Austria	Canada	Cyprus	Czech Republic	Denmark
LEGISLATORS, SENIOR OFFICIALS AND MANAGERS	17.6	10.3	27.3	10.4	13.6
PROFESSIONALS	67.0	87.2	72.7	80.7	77.0
Physical, mathematical and engineering science professionals	1.5	14.4	3.0	3.7	3.9
Life science and health professionals	0.6	3.7	2.0	0.4	1.9
Teaching professionals	15.9	41.3	59.6	54.6	48.5
Other professionals	49.0	27.8	8.1	22.1	22.7
Business professionals	8.1	5.1	3.0	2.9	7.4
Legal professionals	26.1	0.3	0.0	6.8	2.7
Archivists, librarians and related information professionals	0.4	0.6	1.0	0.6	0.0
Social science and related professionals	13.9	19.1	3.0	7.8	12.6
Writers and creative or performing artists	0.4	2.7	1.0	0.1	0.0
Religious professionals	0.1	0.0	0.0	0.0	0.0
OTHER OCCUPATIONS	15.4	2.5	0.0	8.8	9.4
TOTAL	100.0	100.0	100.0	100.0	100.0

Note: All doctoral graduates for Canada and Iceland, 1987–2005 doctoral graduates and 2005 data for Denmark, 1990–2006 doctoral graduates for the other countries.

Sources: OECD (2009), OECD/UNESCO-UIS/Eurostat data collection on careers of doctorate holders.

social science doctoral graduates by occupation in selected OECD countries, 2006

Germany	Iceland	Latvia	Lithuania	Poland	Portugal	Romania	Slovakia	Spain	USA
7.6	22.9	12.3	7.7	1.5	2.6	9.2	2.8	3.4	6.5
77.5	77.1	87.0	92.3	96.1	96.5	82.4	83.2	93.6	91.7
14.3	0.0	4.4	0.9	1.5	0.5	0.2	1.7	0.9	2.2
	4.6	0.0	2.6	0.3	0.3	0.1	0.9	2.0	2.5
17.6	51.7	71.3	68.3	80.5	90.4	67.7	63.1	78.8	38.9
43.5	15.0	11.3	20.5	13.7	5.2	14.3	17.6	9.8	48.2
15.1	1.3	1.7	7.0	7.7	0.2	0.6	2.3	2.0	4.5
17.6	0.0	2.0	6.4	2.1	0.9	8.6	3.4	4.4	0.3
	0.0	0.0	0.0	0.3	0.0	0.0	0.3	0.4	0.2
	12.5	6.1	7.2	3.5	4.0	4.7	9.1	2.8	42.0
	0.0	0.7	0.0	0.0	0.0	0.4	0.6	0.2	0.7
	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.0	0.2
14.9	0.0	0.7	0.0	2.4	0.9	8.4	13.9	3.0	1.8
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Abbreviations and acronyms

A&H	Arts and humanities
A&HCI	Arts and Humanities Citation Index
AAPS	African Association of Political Science
AASSREC	Association of Asian Social Science Research Councils
AAU	African Association of Universities
ACLS	American Council of Learned Societies
ACSS	Arab Council for the Social Sciences
AERC	African Economic Research Consortium
AERC	Applied Economics Research Centre (Pakistan)
AFREPREN/FWD	African Energy Policy Research Network/Foundation for Woodstove Dissemination
AHCI	Arts and Humanities Citation Index
AHELO	Assessment of Higher Education Learning Outcomes
AIDS	Acquired Immune Deficiency Syndrome
AILA	Association Internationale de Linguistique Appliquée [International Association of Applied Linguistics]
AJOL	African Journals Online
ALRN	African Labour Research Network
ANECA	Agencia Nacional de Evaluación de la Calidad y Acreditación [National Agency for Quality Assessment and Accreditation (Spain)]
AP	Asia-Pacific
ARG	Argentina
ASSAF	Academy of Science of South Africa
ASSC	Arab Council for the Social Sciences
AU	African Union
AUS	Australia
AUT	Association of University Teachers
BEL	Belgium
BERD	business sector expenditure on research and development
BGR	Bulgaria
BIREME-OPS	Biblioteca Regional de Medecina–Organización Panamericana de la Salud [Regional Library of Medicine–Pan-American Health Organization]
BOAI	Budapest Open Access Initiative
BPO	business process outsourcing
BRCSS	Building Research Capability in the Social Sciences
BREAD	Bureau for Research and Economic Analysis of Development

BRIC	Brazil, Russia, India and China
BSLM	Behavioural Science Learning Module
BSSRC	Bangladesh Social Science Research Council
CAPES	Coordenação de Aperfeiçoamento de Pessoal de Nível Superior [Coordinating Agency for the Improvement of Higher Education] (Brazil)
CAS	Chinese Academy of Sciences
CASS	Chinese Academy of Social Sciences
CAUT	Canadian Association of University Teachers
CBR	Centre for Basic Research (Uganda)
CDH	Careers of Doctorate Holders
CDR	Centre for Development Research (Denmark)
CEBRAP	Centro Brasileiro de Análise e Planejamento [Brazilian Centre of Analysis and Planning] (Brazil)
CEDES	Centro de Estudios de Estado y Sociedad [Centre for the Study of State and Society] (Argentina)
CERI	Centre for Educational Research and Inovation (France)
CESSDA	Council of European Social Science Data Archives
CHE	Switzerland
CHERPA	Consortium for Higher Education and Research Performance Assessment (European)
CHSSCD	Chinese Humanities and Social Sciences Citation Database
CINVESTAV	Centro de Investigación y de Estudios Avanzadas [Center for Research and Advanced Studies of the National Polytechnic Institute] (Mexico)
CIS	Commonwealth of Independent States
CISEA	Centro de Investigationes Sociales sobre el Estado y la Administración [Centre of Social Research on the State and Administration] (Argentina)
CLACSO	Consejo Latinoamericano de Ciencias Sociales [Latin American Council Social Sciences]
CLAD-SIARE	Centro Latinoamericano de Administración para el Desarrollo [Latin American Center for Development Management – Analytical Information System on Public Sector Reform]
CNA	Consejo Nacional de Acreditación [National Council of Accreditation] (Colombia)
CNEAI	Comisión Nacional Evaluadora de la Actividad Investigadora [National Commission for the Evaluation of Research Activity] (Spain)
CNPq	Conselho Nacional de Desenvolvimento Científico e Tecnológico [National Council for Scientific and Technological Development] (Brazil)
CNRS	Centre National de Recherche Scientifique [National Centre of Scientific Research] (France)
CO-REACH-SSR	Co-ordination of Research between Europe and China – Social Science Research
CODESRIA	Council for the Development of Social Science Research in Africa
CONACYT	Consejo Nacional de Ciencia y Tecnología [National Council on Science and Technology] (Mexico)
CONICET	Consejo Nacional de Investigaciones Científicas y Técnicas [National Council of Scientific and Technical Research] (Argentina)
COSH	Centre of Social Sciences and Humanities (Pakistan)
COSS	Council of Social Sciences (Pakistan)
COST	European Cooperation in Science and Technology
CPP	citations per publication
CRE	Centre of Research Excellence
CREST	Centre for Research on Science and Technology (South Africa)
CROP	Comparative Research Programme on Poverty (based in Norway)
CSDS RAS	Centre for Science Development Studies of Russian Academy of Sciences
CSIC	Consejo Superior de Investigaciones Científicas [Superior Council for Scientific Research] (Spain)
CSIR	Council of Scientific and Industrial Research (India)
CSSCI	Chinese Social Science Citation Index
CYP	Cyprus
CZE	Czech Republic

DANIDA	Danish International Development Assistance
DARPA	Defense Advanced Research Projects Agency (USA)
DICE	Difusión y Calidad Editorial de las Revistas Españolas de Humanidas y Ciencias Sociales y Jurídicas [Diffusion and Editorial Quality of Spanish Journals of Humanities, Social Sciences and Law]
DNK	Denmark
DOAJ	Directory of Open Access Journals
ECLA	Economic Commission for Latin America
ECPR	European Consortium for Political Research
EHESS	École des Hautes Études en Sciences Sociales [School for Advanced Studies in the Social Sciences] (France)
E-LIS	E-prints in Library and Information Science
EP	environmental psychology
ERA	Excellence in Research for Australia
ERC	European Research Council
ESCWA	United Nations Economic and Social Commission for Western Asia
ESF	European Science Foundation
ESFRI	European Strategy Forum on Research Infrastructures
ESP	Spain
ESRC	Economic and Social Research Council (UK)
ESS	European Social Survey
EST	Estonia
ESTIME	Évaluation des Capacities Scientifiques, Techniques et d'Innovation des Pays Méditerranéens [Evaluation of Scientific, Technology and Innovation Capabilities in Mediterranean Countries]
ETH	Eidgenössische Technische Hochschule [Swiss Federal Institute of Technology]
ETP	Extra-Teacher Program
EU	European Union
EURAB	Europe Research Advisory Board
FAPESP	Fundação de Amparo à Pesquisa do Estado de São Paulo [Sao Paulo Research Foundation]
FCSM	Field Citation Score Mean
FIN	Finland
FINEP	Financiadora de Estudos e Projetos [Brazilian Innovation Agency]
FLACSO	Facultad Latinoamericana de Ciencias Sociales [Latin American Social Sciences Faculty]
FNDCT	Fundo Nacional de Desenvolvimento Científico e Tecnológico [National Fund for Scientific and Technological Development] (Brazil)
FoS	Fields of Science
FP	Framework Programme
FRIDA	Forskningsresultater, informasjon og dokumentasjon av vitenskapelige aktivitetekauppir [Research results, information and documentation of scientific activities]
FTE	full-time equivalent
G20	Group of Twenty
GAL	Gesellschaft für Angewandte Linguistik [Society for Applied Linguistics] (Germany)
GDI	gross domestic income
GDP	gross domestic product
GECHS	Global Environmental Change and Human Security
GERD	gross expenditure on research and development
GI	government issue
GOVERD	government expenditure on research and development
GUNI	Global University Network for Innovation
HC	headcount
HE	higher education

HEFCE	Higher Education Funding Council for England
HEI	higher education institution
HERD	higher education expenditure on research and development
HESA	Higher Education Statistics Agency (UK)
HIV	human immunodeficiency virus
HSRC	Human Sciences Research Council (South Africa)
IAS	Institute for Advanced Study (USA)
IAS-Fudan	Fudan Institute for Advanced Study in Social Sciences (China)
IBBS	International Bibliography of the Social Sciences
IBE	International Bureau of Education
IBH	India Book House
ICOPHIL	International Conference on Philippine Studies
ICREA	Institució Catalana de Recerca i Estudis Avançats [Catalan Institution of Research and Advanced Studies]
ICSSR	Indian Council of Social Science Research
ICT	information and communications technologies
IDB	Inter-American Development Bank
IDRC	International Development Research Centre (Canada)
IEMED	Institut Europeu de la Mediterrània [European Institute of the Mediterranean]
IESALC	Institut International de l'UNESCO pour l'Éducation Supérieure en Amérique Latine et dans les Caraïbes [UNESCO International Institute for Higher Education in Latin America and the Caribbean]
IFLA	International Federation of Library Associations and Institutions
IFPRI	International Food Policy Research Institute
IFSP	International Forum on the Social Science–Policy Nexus
IHDP	International Human Dimensions Programme
IHEP	Institute of Higher Education Policy (USA)
IIT	Indian Institute of Technology
IMF	International Monetary Fund
INASP	International Network for the Availability of Scientific Publications
INR	Indian Rupee
IOM	International Organization for Migration
IOR	institutional online repository
IPPR	Institute for Public Policy Research (UK)
IPS	Institute of Policy Studies (USA)
IPSA	International Political Science Association
IRD	Institut de Recherche pour le Développement [Research Institute for Development] (France)
ISCED	International Standard Classification of Educational Disciplines
ISF	International Science Foundation (USA)
ISI	Institute for Scientific Information
ISL	Iceland
ISS RAS	Institute for the Study of Science of the Russian Academy of Sciences
ISSC	International Social Science Council
IT	information technology
ITN	Insecticide-Treated Net
IUPSYS	International Union of Psychological Science
IWT	Institut für Wissenschafts und Technikforschung [Institute for Science and Technology Studies] (Germany)
JCR	Journal Citation Reports
JET	Joint Education Trust (UK)

JPN	Japan
JUST	Jordan University of Science and Technology
LA	Latin America
LAC	Latin America and the Caribbean
LSE	London School of Economics (UK)
LTU	Lithuania
LTV	Latvia
MA	Masters
MASS	Maori Association of Social Scientists
MCT	Ministério da Ciência e Tecnologia [Ministry of Science and Technology] (Brazil)
MDG	Millennium Development Goals
MEC	Ministerio de Educação [Ministry Education] (Brazil)
MED	Medical Papers
METRIS	Monitoring European Trends in Social Sciences and Humanities
MICIT	Ministerio de Ciencia y Tecnología [Ministry of Science and Technology] (Costa Rica)
MINCYT	Ministerio de Ciencia, Tecnología e Innovación Productiva [Ministry of Science and Technology] (Argentina)
MIT	Massachusetts Institute of Technology (USA)
MOE	Ministry of Education
MORST	Ministry of Research, Science and Technology (New Zealand)
MOST	Ministry of Science and Technology
NBER	National Bureau of Economic Research (USA)
NCES	National Center for Education Statistics
NEPAD	New Partnership for Africa's Developement
NGO	non-governmental organization
NIES	National Institute for Education Statistics (USA)
NIH	National Institute of Health (USA)
NISC	National Inquiry Service Centre (USA)
NOR	Norway
NORAD	Norwegian Agency for Development Cooperation
NORFACE	New Opportunities for Research Funding Agency Cooperation in Europe
NPO	not-for-profit organization
NSB	National Science Board (USA)
NSE	natural sciences and engineering
NSF	National Science Foundation (USA)
NUS	National University of Singapore
NWO	Nederlandse Organisatie voor Wetenschappelijk Onderzoek [Netherlands Organization for Scientific Research]
NYC	New York City
NYU	New York University
OA	open access
OAU	Organization of African Unity
OECD	Organisation for Economic Co-operation and Development
OJS	open journal system
OMC	open method of coordination
OSSREA	Organization for Social Science Research in Eastern and Southern Africa
PAASE	Philippine-American Academy of Science and Engineering
PhD	doctor of philosophy
PIDE	Pakistan Institute for Development Economics

PLO	Palestine Liberation Organization
PNPG	National Postgraduate Programmes
PNPG	Planos Nacionais de Pós-graduação [Brazilian Graduate Programmes]
POL	Poland
PPI	Programa de Promoción del Investigador [Programme for the Promotion of Researchers] (Venezuela)
PPI	public–private initiative
PPP	purchasing power parity
PRO	public research organization
PROGRESA	Programa Educación, Saludy Alimentacion [Education, Health and Nutrition Programme of Mexico]
PRSPs	Poverty Reduction Strategy Papers
PRT	Portugal
QS	Quacquarelli Symonds
R&D	research and development
RAE	Research Assessment Exercise (UK)
RAEC	Red Académica Electrónica de CLACSO [CLACSO's Electronic Academic Network]
RAS	Russian Academy of Sciences
RCUK	Research Council UK
RECS	Revistas Españolas de Ciencias Sociales [Spanish Journals of Social Sciences]
REDALYC	Red de Revistas Científicas de América Latina y el Caribe, España y Portugal [Network of Scientific Journals of Latin America and the Caribbean, Spain and Portugal]
REDUC	Red Latinoamericana de Información y Documentación en Educación [Latin America Network of Information and Documentation on Education]
REPEC	Research Papers in Economics
RESH	Revistas Españolas de Ciencias Sociales y Humanas [Spanish Journals of Social and Human Sciences]
RFBR	Russian Foundation for Basic Research
RFH	Russian Foundation for Humanities
RICARDIS	Reporting Intellectual Capital to Augment Research, Development and Innovation in SMEs
RICYT	Red de Indicadores de Ciencia y Tecnología [Network of Science and Technology Indicators]
ROM	Romania
ROSSTAT	Federal State Statistics Service (Russian Federation)
RQAN	Return of Qualified African Nationals
RQF	Research Quality Framework
RSA	related scientific activity
S&E	science and engineering
S&T	science and technology
SA	South Africa
SADC	Southern African Development Community
SAHARA	Social Aspects of HIV/AIDS Research Alliance
SAPES	Southern Africa Political Economy Series
SARUA	Southern African Regional Universities Association
SCAS	Swedish Collegium for Advanced Study
SCI	Science Citation Index
SCI-E	Science Citation Index Expanded
SCIELO	Scientific Electronic Library Online
SESTAT	Scientists and Engineers Statistical Data System
SET	Science, Engineering and Technology
SHARE	Survey of Health, Ageing and Retirement in Europe
SIDA/SAREC	Swedish International Development Cooperation Agency/SIDA's Department for Research Cooperation
SIR	Scimago Institutional Ranking

SJTUIHE	Shanghai Jiao Tong University Institute of Higher Education
SME	small and medium enterprises
SNI	Sistema Nacional de Investigadores [National System of Researchers]
SPEaR	Social Policy Evaluation and Research
SPRU	Science and Technology Policy Research Unit, University of Sussex
SS	social sciences
SS&H	social sciences and humanities
SSA	sub-Saharan Africa
SSBL	social science, business and law
SSCI	Social Science Citation Index
SSH	social sciences and humanities
SSHRC	Social Sciences and Humanities Research Council
SSRC	Social Science Research Council
ST&I	science, technology and innovation
STEM	science, technology, engineering and mathematics
STI	science, technology and innovation
SU-HSE	State University Higher School of Economics (Russian Federation)
SVK	Slovakia
SWE	Sweden
TAC	Treatment Action Campaign
TB	tuberculosis
THES	Times Higher Education Supplement
TRIPs	Trade-Related Aspects of Intellectual Property Rights
UAEM	Universidad Autónoma de Estado de México [Mexico State Autonomous University]
UCLA	University of California Los Angeles
UGC	University Grants Commission
UIS	UNESCO Institute for Statistics
UK	United Kingdom
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNU-CRIS	United Nations University-Comparative Regional Integration Studies
UNU-IAS	United Nations University-Institute of Advanced Studies
UOE	UNESCO-UIS/OECD/Eurostat
UQAM	Université du Québec à Montréal [Québec University in Montréal]
US	United States of America
USA	United States of America
USAID	United States Agency for International Development
USD	United States dollar
WoS	Web of Science
WHO	World Health Organization
WTO	World Trade Organization
WW	World War
WWW	World Wide Web
ZiF	Zentrum für Interdisziplinäre Forschung [Centre for Interdisciplinary Research] (Germany)

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The International Social Science Council (ISSC) is an independent, non-governmental organization and the primary international body representing the social, behavioural and economic sciences at a global level. It was founded by UNESCO in 1952.

The Council has a wide membership, from which it draws its strength and its role. ISSC members include:
- international disciplinary associations or unions;
- national academies of science or social science;
- national research councils;
- regional associations of social sciences; and
- other national and international agencies and foundations.

The ISSC's mission is to advance the social sciences – their quality, novelty and utility – in all parts of the world and to ensure their effective global representation.

The Council works as a catalyst, facilitator and coordinator, bringing together researchers, scholars, funders and decision-makers from all parts of the world in order to promote global social science presence and authority, capacities and connectivity. This involves:
- promoting innovative, inter- and cross-disciplinary, comparative social science research and knowledge exchange;
- determining priorities for the future of international social science;
- providing global platforms to articulate, and strengthen, social science expertise on the most urgent questions of the day;
- strengthening social sciences in developing and transitioning societies;
- fostering international collaboration on the basis of equal partnerships;
- collecting, analysing and disseminating data on social science systems and resources, their availability and impact in different parts of the world;
- broadening inter-disciplinary collaboration among the social sciences, and expanding exchange and joint work between the social sciences, the humanities, natural and other sciences;
- linking social science knowledge effectively to public policies and local needs;
- advancing the social science literacy of citizens.

In addition to producing regular *World Social Science Reports*, key ISSC activities include the convening of World Social Science Fora, the co-sponsorship of international scientific programmes and research networks, as well as actions aimed at developing a future generation of world social science leaders.

The ISSC secretariat is based in Paris and directed by Heide Hackmann, Secretary-General.

The *2010 World Social Science Report* has been produced by an Editorial Team selected and appointed by the ISSC, and was led by Françoise Caillods, Senior Managing Editor.

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