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MEASURING OUTPUT AND PROFILES OF UNITS IN SWISS COMMUNICATION SCIENCES

Report of the project
"Measuring Research Output in Communication Science and Educational Sciences between international benchmarks, cultural differences and social relevance"

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1 Preface

We live in a world of standards. The measuring and evaluation of the output and performance of scientific disciplines has become increasingly important in the life of SSH scientists. Financed by public money, the scientific community has to give account of their activities. But of course - and social scientists know this very well - not all measuring instruments or indicators are able to measure the different types of products in Swiss communication sciences. In the case of Switzerland especially, we have to take into account cultural and linguistic differences as well as the diversity of product types. It is not just knowledge production activities which are important, but also educational and transfer activities. Through the involvement of representatives of the Swiss Association of Communication and Media Research (SACM), the scientific community had the chance to co-construct the instruments and indicators pragmatically by helping to find an acceptable consensus. The project also considers activities that go beyond what is usually measured through (English) publications. The project and its results can be a reference and a starting point in identifying and positioning Swiss media and communications science, but also for every single research unit by comparing itself with the benchmark. Of course, it is not possible to draw a complete picture of all the important activities. But the discussion about standards of performance is essential in this highly political process of evaluation and legitimation. The SGKM thanks the research group for this valuable work, which can help us by shaping future political decisions.

Prof. Dr. Vinzenz Wyss, President of Swiss Association of Communication and Media Research (SGKM)

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List of abbreviations

CRUS	Rectors' Conference of the Swiss Universities
SNF	Swiss National Science Foundation
SGKM	Swiss Communication Sciences Association
RU	Research Unit
FTE	Full Time Equivalents
HC	Headcounts
UAS	Universities of Applied Sciences
SFSO	Swiss Federal Statistical Office
SIUS	Information System on Swiss Universities

2 Conceptual framework: research units and their profiles

This report presents an analysis of the domain and activities of Swiss communication sciences, with a specific focus on research outputs. It is based on data collected for the project 'Measuring Research Output in Swiss Communication Sciences and Educational Sciences', realized by the Universities of Fribourg (Department of Media and Communication Science and Evaluation Service) and Lugano (Centre for Organizational Research, Faculty of Economics) in cooperation with the Swiss Communication Sciences Association (SGKM) and financed by the Rectors' Conference of the Swiss Universities (University cooperation program on measuring research performances).

The aim of the project was to devise a methodology for producing activity profiles and measuring research outputs tailored to the specificities of Social Sciences and Humanities. The methodology behind the report was defined in collaboration with an expert group mandated by the SGKM composed of professors from the field of communication sciences. Besides this general report, individual reports providing detailed data on individual *research units* (RUs) have been produced for the use of the units themselves.

This work is led by three underlying questions, which are rooted in the scholarly literature on research units and laboratories (Crow and Bozeman, 1987, Larédo and Mustar, 2000):

- First, to investigate the diversity of research units in the field, concerning both their structural characteristics and, in particular, their different *activity profiles*; besides its cognitive value, we consider that a careful mapping of diversity is a prerequisite for any type of strategic action.
- Second, to understand the extent to which these characteristics are determined by *structural factors*, like the institutional position of the unit or differences related to subfields in communication; this is highly relevant as it will allow us to identify the spaces for positioning and change of units and thus be a central input for any kind of policy.
- Third, to understand the implications of our results for the strategic decisions of the research units themselves, and of the institutions they belong to; we are thus dealing with the question of the *use of indicators and measures to support institutional policies and strategies*.

In the introduction that follows, we deal with the conceptual foundations of our work and, in particular, with underlying questions concerning the characteristics of research units and of their relationships with the environment. In chapter 3, we apply these reflections in developing a concrete instrument of measurement based on quantitative indicators and the construction of activity profiles. In chapter 4, we present the quantitative results at the level of the whole field of Swiss communication sciences, while in chapter 5 we focus more specifically on the diversity of research units and on their determining factors. Finally, chapter 6 identifies implications for evaluation and strategic decision-making, at both unit and university level, and advances some recommendations for the institutionalization of the system at a wider level.

2.1 Research units as multi-activity organizations

In the last three decades, through science and research policies, the notion has developed of research group laboratories as the main loci of the production of scientific knowledge. While it is clear that production of scientific knowledge is strongly rooted in the ideas and competences of the individual researchers involved and, accordingly, human resources are the central asset for science both at the unit, institutional and country level (Bozeman *et al*, 2001), science studies have widely demonstrated that research is an increasingly collective undertaking, at the cognitive, social and managerial levels. Moreover, there is substantial evidence from the economics of science that, beyond individual characteristics, the features of the laboratory they belong to also influence the productivity of individual researchers (for a review see Carayol and Matt, 2006). For these reasons, we focus on research units as the most relevant level for the organization of research activities.

Scientific studies have focused mainly on laboratories as social collectives and investigated their internal socio-cognitive dynamics using an ethnographic approach (Latour and Woolgar, 1979; Knorr Cetina, 1995). In keeping with with the objective of providing instruments for the evaluation of research activities, throughout this report we use the name of research units to indicate *organized collective entities*, which are officially recognized by the institution to which they belong, display some level of internal organization and are able to manage their own budget (Larédo and Mustar, 2000). As we shall discuss in chapter 3, the application of this definition in the context of Swiss communication sciences is far from straightforward, as Swiss higher education institutions display quite different forms of organization. Accordingly, the sample in this study is characterized by a high level of heterogeneity concerning structural position within the institution, size, and internal organization. This needs to be carefully considered when interpreting the results.

Despite the name, we consider research units to be *multi-activity and multi-product organizations*, which build on a set of inputs – especially human resources, but also financial resources, infrastructures, etc. – in order jointly to produce a set of outputs, including degrees, research publications, transfer to society and the economy (Larédo and Mustar, 2000). This implies that, in order to characterize their activity (and possibly their productivity), it is not sufficient to consider a single dimension – e.g. only international publications as used in most international rankings. Instead, it becomes necessary to measure all main types of products for each RU. Accordingly, we will collect a set of different indicators for each dimension, as presented in detail in section 3.4.

The notion of multi-product units also implies that there are no straightforward relationships between inputs and outputs, but that *joint production* is the rule. For example, RU staff are engaged in both education and research and, to some extent, produce them jointly (e.g. by using research results in order to prepare teaching activities as well).

There is an ongoing debate in economics of science concerning the best combination of input factors – for example, around the notion of critical resources for scientific production (Weisenburger and Mangematin, 1995). This includes issues such as to what extent joint production of research and education increases productivity, the trade-offs between acquisition of third-party funding and scientific production (Schmoch *et al*, 2010), as well as between transfer and acquisition of private funding and scientific production (Bonaccorsi *et al*, 2007). A number of studies also clearly demonstrates that structural characteristics and internal organization of the research units – for example, concerning human resources – do influence productivity (Carayol and Matt, 2004), thereby indicating that a careful analysis of a unit's organization might be required to understand its outcomes.

These questions are not just of scholarly interest, but of prime relevance for the public policies and strategic decisions of higher education institutions and heads of research units as they address some questions central to their strategic decision making – for example, what is the best strategy for human resources development, is it better to focus on a single mission or to pursue a more differentiated strategy and is the transfer and acquisition of external resources beneficial or detrimental to the scientific unit productivity. We provide some empirical evidence on these questions in the field of communication sciences in chapter 5 of this report.

2.2 Strategies, profiles and positioning

The second central concept of this study – namely *profiles* – incorporates the idea that the different dimensions of RU activities are not independent but complementary, with trade-offs between them, and that it is legitimate for individual units to weight differently these dimensions in their portfolio of activities (Larédo and Mustar, 2000, Schmoch *et al*, 2010).

Moreover, as research units compete for resources, students and reputation, profiles can become an instrument for competitive differentiation and for addressing a specific niche in terms of activities and products, complementary to other units in the same field. This notion of *competitive differentiation* considers that the research and higher education system needs to fulfil many different functions – from

undergraduate education to knowledge production to transfer – and thus the presence of units with different profiles is a positive characteristic at the system level. In this respect, compared to one-dimensional rankings, profiles provide a more adequate tool for characterizing RUs in such a diverse and multifunctional field as communication science.

Measured profiles provide a synthetic representation of how individual research units manage these interdependencies between different activities, taking into account constraints from their organizational design and institutional positioning (see below chapter 2.3), as well as competitive relationships with other units. Profiles are thus an instrument for measuring differentiation between units, but also an instrument for evaluation and strategic decision making (see further in chapter 2.4).

Despite the prevalence of one-dimensional rankings in the policy debate, there is an increasing recognition that these approaches – despite their greater complexity – are better able to capture the diversity of the European research system and are especially well-suited to the fields of social sciences and humanities. In the last ten years, a small body of literature has emerged on how to operationally measure profiles of research units (Larédo and Mustar, 2000), as well as of higher education institutions (van Vught, 2009). In general terms, they converge in identifying three broad dimensions of RU activities:

- *Educational activities*, i.e. activities producing degrees as well as "intermediate products" like teaching hours and theses; these activities can be further divided by level of education, distinguishing between Bachelor's, Master's and further education.
- *Knowledge production activities*, i.e. activities developing new knowledge and personal skills for research; these are mostly incorporated in scientific publications, but also embodied in people trained for research, especially PhD students.
- *Transfer activities,* i.e. activities aiming at exploiting existing or newly produced knowledge for the benefit of society (public transfer) and of economy (private transfer; see Gulbrandsen and Slipersaeter, 2007). These take such forms as report writing, consultancy, services, as well as personnel expertise (e.g. through membership of commissions or boards).

Moreover, there is vast literature on science and technology (S&T) indicators which provides some indication of the kinds of measures that can be reliably used for these dimensions (see for example Moed *et al*, 2004), in addition to studies dealing specifically with the limitations of bibliometric indicators to measure output in social sciences and humanities (Hicks, 2004). While it is by no means the purpose of this report to present a complete overview of these works, we do make reference to them when dealing specifically with individual dimensions and indicators (see further chapter 3.4).

2.3 Limited by design: research units and their environment

The notion of profiles comes with an understanding that RUs, through their heads of unit, are able to take strategic decisions concerning research directions, alliances or fund-seeking strategies in order to position themselves and find the best niche in terms of combination of activities and products (i.e. to foster the growth of the unit itself). Accordingly, in this project we also collect information on how heads of units perceive their unit's profile and how this is likely to evolve in future years.

At the same time, it is evident that individual research units are to a large extent constrained by their organizational design and environmental conditions (Crow and Bozeman, 1998). For instance, a wide-ranging study on US R&D laboratories showed that they can be classified according to two main dimensions: their degree of publiciness, measured in terms of the organizations' proportions of influence by political and economic authority, and their orientation towards either generic production of knowledge or proprietary products tailored to specific users (Crow and Bozeman, 1987).

In this project, we are dealing solely with public-sector research units, in terms of their legal status – all of them belong to public universities – and origin of funding. However, there are still relevant differences in RU environment which need to be considered when interpreting the data. A central question we will address in chapter 5 is to what extent the observed profiles are the outcome of historical and

environmental conditions, and what are the degrees of freedom for modifying these profiles. Diversity among the RUs is characterised by different points:

a) Firstly, the RUs considered belong to different *higher education institutions*, which might not only have different strategies, but also institutional missions. At the broadest level, in the Swiss system there is a clear distinction between universities and Universities of Applied Sciences (UAS; Lepori, 2008): the former have a mandate of general purpose tertiary education – with most students following a five-year curriculum – and of basic research, whereas UAS are mandated to focus on shorter professional education (mostly three years bachelor) and on applied research oriented towards application. Accordingly, we expect a clear difference in profile between university-based and UAS-based RUs. Other differences might be related to the specific orientations of individual universities – for example, Sankt Gallen with its strong focus on management and cooperation with private companies.

b) Secondly, it is well-known that communication sciences are characterized by a high-level of internal diversity, resulting from different conceptions of the field and connections to parent disciplines – e.g. the contrast between a German-oriented approach with a focus on political communication and media studies and a broader Anglo-Saxon definition with a focus on interpersonal communication and argumentation. A previous study has shown that, in part due to the multilingual and multicultural nature of the country, these distinctions apply also to Swiss communication sciences (Probst and Lepori, 2007, Lepori and Probst, 2009; see further chapter 4.1). Subfields differ markedly concerning their cognitive orientation, but also the publication media and language used and their patterns of activity; accordingly, we expect systematic differences between RUs in each subfield.

c) Thirdly, while the concept of strategic profiles might give the impression that RUs are quite flexible and can switch between different activities and product markets depending on the available niches, in reality there is strong irreversibility in their positioning. Firstly, participation in product markets in research and education is a long-term process which requires establishing a brand and creating stable ties with other actors, like funding agencies or student groups; these markets are also usually characterized by significant barriers to entry. Secondly, the structure of RUs in terms of organization and production is itself strongly given to rigidity, for example in relation to the personnel structure – human resources required for teaching activities being different than for research – as well as identity and organizational culture. This implies that the process of changing the profile of a RU will be in most cases rather slow and gradual, as life-cycle studies of RUs clearly display (Braam and Van den Besselaar, 2010). Observed differences among RUs are thus also a result of their history.

2.4 From profiles to evaluation: the normative dimension

Profiles as such are largely descriptive tools: they display the level of involvement of individual research units in different activities – education, teaching, transfer. Of course, some normative and value choices are hidden behind the indicators used for each dimension, for example counting scientific publications as a main indicator of involvement in science. At the same time, they avoid explicitly defining the relative importance of each activity dimension, and thus avoid implying for example that units more oriented towards science production are superior to those more involved in teaching. This is their central difference from other tools which evaluate all units on a single scale, like rankings.

In terms of the evaluation culture, profiles lead to a differentiated approach, where it is considered legitimate that research units engage in different types of activities and important to provide a careful assessment of each of them, before deciding on which deserve a higher degree of priority. Also, it promotes a more pragmatic approach, taking into account that the profile of a research unit is the outcome of a complex set of interdependencies between available competencies, environmental resources and strategic choices, which need to be taken into account when deciding changes. Instead of a unique recipe for how to reform research units, it promotes a contextualized approach, where reforms build carefully on the specific strengths of each unit, and on a careful analysis of the available (and realistically achievable) opportunities.

This choice is coherent with the characteristics of the field of investigation, where there are different interests and legitimate orientations. Thus, a head of unit wishing to promote international academic visibility is likely to find application-oriented profiles unsatisfactory, but these same profiles might be considered adequate from the perspective of a head of unit if they ensure sufficient resources through contracts and are coherent with the profile of the engaged people. At the institutional level, a profile oriented towards international visibility will be considered as adequate for a university wishing to strengthen this dimension, but probably not for a university of applied sciences, where it might even be regarded as not corresponding to the overall mission of the institution.

Evaluation of profiles is thus always contingent on specific strategic choices and norms regarding the expected research output (Schmoch *et al*, 2010). They offer a flexible tool which can be utilized by different actors as relevant input for their evaluation and decision-making, but cannot replace the definition of goals and objectives to be achieved. Accordingly, as discussed in the last chapter of this report, profiles can be mobilized for different uses: to allow heads of RUs to recognise their strengths and weaknesses compared to other units in the field, to provide rectors and deans with an overview of the differences between their research units (as compared with the Swiss landscape) and, finally, to provide a helicopter view of the internal differentiation of the whole field of Swiss communication.

3 Developing indicators for Swiss communication sciences: conceptual and technical issues

In this section, we explain how the general concepts developed in the previous chapter have been translated into a specific instrument which allows us to measure and compare quantitatively the activities and profiles of research units. This is an essential step both for empirical analysis and for evaluation purposes. However, it is far from being an easy process, as it entails a number of choices concerning the definition of the perimeter and of the units to be involved, the selection of the indicators and how they are measured and, finally, the construction of synthetic profiles. Besides giving a presentation of methodological issues, this section is therefore also a guide to better understanding and interpreting the project results.

Accordingly, we start with a general reflection on the epistemological and sociological nature of science and technology (S&T) indicators, which is critical in order to understand the meaning of the results presented in this report. In the following sections, we discuss more specifically how we dealt with a number of technical issues, namely the definition of the perimeter to be considered and the delimitation of RUs, the selection of indicators and of their measures and the construction of benchmarks and profiles.

3.1 Indicator construction as a social process

The reader expert in the sociology of measurement will recognize in the construction of indicators one of the most central practices in scientific work (and, overall, in society and politics): the formulation of standardized categories, classification and data collection procedures, which provide socially accepted and standardized images of the world. A rich sociological literature has demonstrated that this process is never value-free, but that classifications are socially constructed by the communities involved (Bowker and Leigh Star, 1999) and closely related to issues of power and legitimacy. For instance, controversies over the nature of objects and classification have largely shaped the current structure of scientific disciplines and helped to clearly delimit who can legitimately belong to a scientific field (Bryant, 2000). Consequently, a project characterizing Swiss communication sciences is also a social and political act delimiting the borders and the central characteristics of the field itself.

These considerations become even more relevant when looking at the construction of indicators to measure research and educational activities, given their potential use for strategic decision making, evaluation and distribution of resources. The literature on S&T statistics and indicators has demonstrated the extent to which the indicators currently in place reflect specific understandings of how the research system works – for example the macroeconomic input-output model which informed the creation of S&T statistics at the OECD after the Second World War (Godin, 2005).

Following the recent literature on S&T indicators, we do not assume that indicators reflect reality in an objective way, but rather that they are (provisional) indications which need to be contextualized and interpreted by expert people. They are not answers to questions, but rather a starting point for a debate where the actors involved might question them, suggest corrections or even refute their validity. Indicators have lost the privileged status of objective measures of the social ontology, and have instead become tools for mediation of points of view and interests in society (Barré, 2004). This is why we have chosen in this report to provide different views and aggregations of the indicators, so as to provide alternative views of reality which can be combined to give a meaningful picture.

The previous discussion does not imply that indicators are useless; they are in fact extremely powerful instruments with which to synthesize and quickly compare different realities by using a common standard. In this way, they can give objectivity to social debates – e.g. on research quality – and reveal systematic patterns which might otherwise go unnoticed. We consider this role to be particularly important in a field

like communication sciences, where the current cognitive and geographic fragmentation makes it difficult to get a ready overview of what is going on.

Also, the fact that indicators are always value-laden does not mean that they are arbitrary; in fact, there is widespread experience in developing and using S&T indicators which provides evidence on which indicators can be used for which question, on their reliability and on good practices concerning their production. This evidence converges on the general recipe that good indicators should be built on three main components (Lepori *et al*, 2008):

- A *sound theoretical modelling* of the phenomenon to be observed, which justifies why a specific measure is assumed as a proxy for a more complex phenomenon and which is supported by some empirical evidence. For instance, science studies show that much of the formal dissemination of scientific knowledge takes place through citings and that there is a general correlation between peer assessment of reputation and number of citations. This justifies the use of impact factors as an indicator of scientific reputation in bibliometrics (van Raan, 2004).
- The *consensus of a reference community* which shares the main conceptual and value choices related to the construction of an indicator. In the case of our project, the choice of delimiting the field of communication sciences by using the SGKM-Atlas was clearly driven by the consensus of the community itself.
- A set of *good technical practices* dealing with issues of data quality, reliability and proper statistical treatment of data, which are part of the professional competence of the people designing and producing indicators. This professional component is also rooted in the knowledge of the specific literature in the field (Moed *et al*, 2004).

As will become clear, these three components have also led the methodological choices made in the project and presented in the remainder of this chapter.

3.2 Defining the perimeter and identifying research units

A first central issue concerns the delimitation of the field of communication sciences, which is particularly complex given its multiple and fragmented nature. In general terms, a scientific field can be defined as the combination of a cognitive territory and of a social community, where people belonging to this community share a basic set of concepts, meanings and languages which provide them with a shared identity and allow communication, while at the same time defining which researchers are legitimate participants in the community (hence the key role of senior researchers acting as gatekeepers; Braun, 2004). Additionally, mature scientific fields become institutionalized through forms of recognition like the labelling of institutes and faculties, the creation of scientific associations and journals, the right to award a doctoral degree, etc (Becher and Trowler, 2001).

Most current approaches to the delineation of scientific fields make use of publication databases and of bibliometric techniques in order to map social structures (through coauthorship and citation analysis), as well as cognitive structures (through co-word analysis; Noyons, 2004). This approach, however, entails well-recognised limitations based on the characteristics of the data sources used for analyses – large international publication databases such as Web of Science or Elsevier Scopus. They focus on international, English language, journal publications, and are therefore useful for the analysis of fields where this type of publication prevails, such as science and engineering. Other fields, however, organize scientific activity differently. Especially in social sciences and humanities, literature and publications in local languages and monographs or book chapters are frequent (Nederhof, 2006). This affects the usability of results drawn from international databases (van Raan, 2004, Lauf, 2005). There are also challenges in using these databases in young or multidisciplinary fields; for example, it is difficult to identify a core set of journals representative of the aggregate output of a domain.

These challenges apply to the case analyzed in this study: in the field of communication, literature in national languages is frequent (Hicks, 2004, Masip, 2005) and the share of publications in channels other than journals is high. Additionally, scholars tend to publish in journals not labeled as Communication

journals (Froissart and Cardy, 2005). A study based on the Web of Science showed that, at the international level, no stable set of journals which represent the core of the discipline can be identified, even if some tendency towards a clearer delineation can be identified (Leydesdorff and Probst, 2009).

These issues are even more complex at the Swiss level, given the multicultural nature of the country and preliminary evidence that, for example, publication patterns differ widely between linguistic regions and subfields. The choice made in this project was to follow an institutional criterion based on the delineation of the field by the Swiss Communication Sciences Association, as provided in the online Swiss Atlas of Communication Sciences (http://www.sgkm.ch/medienatlas.html). This means that these units are officially recognized – and indeed recognize themselves – as part of the field in Switzerland, even if they might cover quite different fields within communication and refer to different disciplinary roots. In agreement with the accompanying group, this list was then completed by adding a few units which are working in the same domain, even if (at least for the time being) they are not yet included in the Atlas.

This approach is consistent with the institutional construction of the whole project, which has been developed together with the SGKM. At the same time, clearly it is possible that there are units in other departments working on topics we would consider to be communication, as an analysis of the international journals in the field would display. On the other hand, with the definition being based on units rather than on people or publications, it is possible that some of the persons in the sample, even if belonging to RUs considered to be in communication, are in reality active in other scientific domains and publish in their specific journals.

Starting with the Atlas, some of the units listed there have been divided further at the level of individual institutes or divisions (e.g. in Zurich and Lugano); where there was any doubt this division was made in agreement with the heads of the RU involved. While we followed broadly our general definition of what research units are (see chapter 2.1), it should be noted that the disaggregation level differs widely between RUs and that in some cases the disaggregation was pushed so far that the resulting units are to the lower limit of what can be analyzed meaningfully (e.g. RUs with just one professor and a few Phd students).

As participation in the project was on a voluntary basis, all units were contacted individually; as Table 1 displays, most units agreed to take part and provided the required data. Among 31 units listed in the SGKM Atlas, 19 are covered by our sample. Coverage in the University sector is very good, as all units in Bern, Fribourg, Lugano, Neuchâtel and Sankt Gallen, as well as most of the units in Zurich are included; of the universities listed in the SGKM Atlas, only Basel and Geneva are missing from our sample. In contrast, the sample is far from representative in the UAS domain, where only one unit among the five listed in the SGKM Atlas is included.

Therefore, with this proviso, the report can be considered a fairly complete and realistic view of the field as it is currently institutionalized in our country. All data and analyses presented in this report refer to this sample and thus exclude those units which did not participate in the project.

University	Faculty	Unit
University of Fribourg	Faculty of Economics and Social Sciences	Department of Mass Media and Communication Research
University of St. Gallen	Department of Economics	Institute for Media Communication and Management, Division Information and Media Management
		Institute for Media Communication and Management, Division Corporate Communication
		Institute for Media Communication and Management, Division Media and Culture
		Institute for Media Communication and Management, Division Social Media and Mobile Communication
Università della Svizzera italiana	Faculty of Communication Science	Institute of Media Communication (including European Journal Observatory)
		Institute of Communication and Health
		Institute of Linguistics and Semiotics
		Institute of Marketing and Corporate Communication
		Institute of Social Psychology of Communication
		Institute of Technology of Communication (including Technology-Enhanced Communication Laboratory)
		Institute of Communication and Education (including New Media in Education Laboratory)
University of Zurich	Faculty of Arts	Institute for Mass Communication and Media Research, Division Media Reality & Effects
		Institute for Mass Communication and Media Research, Division Media Economics & Management
		Institute for Mass Communication and Media Research, Division Media & Politics
		Institute for Mass Communication and Media Research, Division Media Psychology & Effects
University of Neuchâtel	Faculty of Economics	Academy of Journalism and Medias (AJM)
University of Berne	Faculty of Economics & Social Science	Institute of Mass Communication Studies
Zurich University of Applied Sciences	School of Applied Linguistics	Institute of Applied Media Studies

Table 1. List of the units in the sample

3.3 Delimiting the unit and choosing the right time window

Once the list of RUs has been defined, further decisions have to be made concerning their delimitation and the choice of time window in which to measure activities. The main issues here involve who should be included as a member of the RU, the perimeter for different types of output, and the chosen time window.

a) Persons to be included and employment rate. It is quite common for people to work in different places and therefore have an employment percentage of less than 100%. In these cases, the issue is not only how to count employment, but also to which RU the activities and outputs of each person should be attributed.

We basically distinguished two different situations:

- *Indicators related to time spent in the unit*. In this case, we include in the perimeter all activities of people employed at the unit, independently of their employment rate; of course, these indicators are then normalized by the *full-time equivalents* (FTEs) by taking into account the effective percentage of work of each individual.
- *Indicators related to the individuals as persons and not to their employment contract*. These include, for example, publications or membership of boards of organisations. For these indicators, we include only those members of the research unit who can be considered as having their main academic identity with the research unit under analysis. The following basic rule is applied: we include a person if his/her employment at the considered research unit accounts for at least 50% of his/her total engagement in academic contexts. Any ambiguous cases (e.g. somebody employed twice at 50%) have to be treated individually.

b) Time window. The reference year for this report is 2009. Where one specific moment is necessary for data gathering (e.g. regarding the composition of human resources), we take the end of December as the relevant date. For the few topics for which considering only the last year would not lead to enough data, we look at a 5 year time window (2005-2009). This is the case, for example, with publications: given the small dimensions of the research unit, considering only the publications in a single year risks providing an inappropriate picture of the unit's activities.

When outputs are related to persons – as in the case of publications and scientific awards - we choose to include all outputs of the *currently employed persons* (as of 31.12.2009), regardless of whether they worked in the RU throughout the whole period. Besides practical issues (this avoids looking to outputs of persons who left the unit), this choice has a conceptual basis, as the aim of the project is not to provide a retrospective evaluation of output, but rather a prospective evaluation of the future output potential of the unit. Of course, this will not necessarily reflect what the unit itself has produced in the preceding year, especially for RUs where key people changed quite recently – e.g. where a new head of unit started at the end of 2009.

When looking to the data, of the 237 individuals included in the sample, 167 (70%) were employed at more than 60% by a single unit (also including a large number of PhD students who don't have a full time contract); for these persons, attribution is not ambiguous. A large proportion of the remaining persons were PhD students employed outside academia. In addition, 29 individuals started their activity in the unit concerned during 2009. Changes at the professorial level are particularly problematic in this respect, as they account for a large share of output; of the 38 professors in the dataset, three started their activity in 2009, three others left, while two changed research unit during the year. These data show that personnel changes are unlikely to systematically bias the results at the aggregate level, but might strongly influence results at the level of individual RU, especially for the smallest RUs in the sample. Specific cases will be explicitly marked in the following analysis.

3.4 Dimensions and indicators

As already mentioned, the literature on RU profiles provides a general framework for identifying the main dimensions relevant for defining a profile (Larédo and Mustar, 2000), by distinguishing between

educational activities, knowledge production activities and transfer activities. For the purposes of this project, we further divide educational activities between the three main levels – Bachelor's, Master's and continuing education – and knowledge production between scientific production and research training. Transfer activities are split between public and private sector. Accordingly, we construct profiles based on seven dimensions.

The operationalization of dimensions in measurable indicators is a contestable exercise, as such indicators can only provide proxies for complex phenomena; for example, the number of scientific publications can be considered as a proxy for the production of knowledge, but with significant biases, including the different values of publication media, the fact that codified knowledge is not the only form of knowledge production, etc.

The choice of indicators to be included was far from simple, as each dimension represents a complex pattern of activity which cannot be easily measured with a simple number. The overall strategy has thus been to try to produce more than one indicator for each dimension and then combine them to construct profiles (see chapter 3.5). Three main criteria come into play when choosing indicators, namely:

- Their *validity* and *reliability*, meaning they provide a correct representation of the activity or product. For instance, if it is assumed that scholarly publications are the main medium for diffusion of scientific knowledge, then publication counts can be considered as a good measure.
- Their *feasibility*, meaning that a suitable data collection methodology can be devised and the effort required for data collection is proportionate to the additional information provided by that indicator.
- Their *transparency* and *reliability*, meaning that how the indicator has been produced can be documented and reproduced; for instance, some potentially attractive indicators – like the number of invited speeches – failed to match these criteria as there is no commonly shared definition and the collected data cannot be verified.

While validity and reliability depend a lot on the quality of the conceptual work, feasibility and transparency can be looked at only through concrete data collection. Finally, fairness and independence are addressed when analysing the collected data and confronting the analysed units with the results. In this project, we work with data that is collected directly in the field, from the actors involved.

The choice of indicators listed in Table 2 (page 19) has been discussed extensively with the project accompanying group (composed of professors from different areas of the field and representing universities from different linguistic regions). It is also strongly influenced by limitations of data availability and by the effort required to collect data. In general, we consider this a rather basic list focusing essentially on the quantitative measure of activities and only to a very limited extent on the quality of the products. This is also related to the diverging opinions on how to measure scientific output in social sciences and humanities (SSH), which presents difficulties in agreeing on standardized measures of quality (see the discussion on future extensions in chapter 6).

Below, we detail briefly our choices for each dimension, explain how they are rooted in the S&T literature and which their most important limitations are. Annex 1 to this report presents a complete list including detailed definitions and the identification of subcategories.

Research training. This dimension covers the provision of trained research personnel. In practice, it is based on activities related to doctoral education, as most junior researchers in universities do a doctorate. This can be considered as a fair choice for RUs located in universities, but possibly not for those in UAS, where research training can take other forms, like training in applied research projects young researchers whose skills are then transferred to the private sector. Indicators on career and professional paths would be useful in this respect, but difficult to produce without disproportionate effort.

The basket of indicators chosen tries to balance simple volume indicators (*number of PhD students*) with indicators on products (*number of dissertations*), as well as two simple indicators of quality – the share of PhD students having publications or conference presentations and the share with a stay abroad (as it is generally believed that mobility is beneficial to research careers and productivity; see for example

Commission of the European Communities, 2007). Of course, the interpretation of these indicators needs to be very careful, as, for example, publication practices at the PhD level differ markedly by scientific domain.

Finally, we include an indicator on the doctoral courses organized by the RU during the year, even if it is not particularly reliable as it strongly depends on local practices in doctoral training, respectively if doctoral courses are organized at the unit of department level. Nevertheless, it shows to some degree the involvement of the RUs in formalized PhD training.

Educational activities. This dimension covers the transfer of knowledge through teaching at the levels of Bachelor's, Master's and continuing education, specified separately for each of the three levels. As this dimension is not the central focus of the project, we limit ourselves to a few indicators related to the volume of activities. We include distinct indicators for teaching hours and for theses, as we consider these to be the two main components of educational activities. Moreover, we consider both the number of hours taught by members of the RU and number of hours in curricula directly organized by the RU itself, including teaching by external people (invited teachers).

As most RUs are not directly responsible for managing the educational curricula, attribution and data quality problems might significantly affect the data, particularly concerning the number of hours. Also, as these data have been collected through the head of the unit there might be some imprecision, especially concerning the number of theses, due to lack of information.

Science production. This dimension covers knowledge production that is validated and recognized in the research community, as well as participation in this community at the local, national and international level.

While bibliometrics has become a standard for measuring knowledge production in the hard sciences, measuring scientific output in social sciences and humanities raises specific problems (Nederhof, 2006). In these fields, where international journal publications do not account for the largest part of publication activity (Hicks, 2004), where besides output towards the scientific community scholars pursue other objectives and refer to a broader audience, and where national visibility and transfer to society are also important, there is a general feeling that instruments for performance measurement need to be sensitive to disciplinary and national differences and to take into account the diversity of research group functions (Archambault *et al*, 2006). Accordingly, it is generally acknowledged that this measurement needs to be based on a broader set of data sources than international databases; unfortunately, little progress has been made in the harmonization of these sources at the international level (despite some wide-ranging national examples, like the Norwegian publication database).

Public / non-profit sector and general public. This dimension covers the transfer of knowledge to the public sector, political system, non-profit sector and public administration, for example to address social or political issues or to support the implementation of public policies and services. This also includes participation in public debate and media.

The dimension is looked at through input obtained from the public / non-profit sector, i.e. funding, as well as output towards public or non-profit organizations and the general public. Output towards organizations is measured through membership of boards and commissions of public or non-profit organizations, plus research reports written and presentations held for them, while output towards the general public is looked at through media presence.

Industry and private sector. This dimension covers the transfer of research results to the private economy, to produce innovation and new market value. As with the dimension above, this includes input from (funding) and output towards (membership of boards, research reports, presentations) private organizations.

Dimension	Indicators	Period	Norm.
Research training	Number of doctoral theses	2005-2009	FTE1
	Number of hours taught doctoral courses	2009	FTE1
	Number of hours organised doctoral courses	2009	volume
	Number of internal and external doctoral students	2009	FTE1
	Current doctoral students with at least 1 publication during their doctorate	2009	HC doct st
	Current doctoral students with at least 1 conference presentation during doctorate	2009	HC doct st
	Current doctoral students that have been on a stay abroad of at least 1 month during their doctorate	2009	HC doct st
	Current doctoral students that have been on a short stay (1 week to 1 month) abroad during the year of interest	2009	HC doct st
Education	Number of Bachelor's theses	2009	FTE2
	Number of Master's theses	2009	FTE2
	Number of further education theses	2009	FTE2
	Number of hours taught Bachelor	2009	FTE2
	Number of hours taught Master	2009	FTE2
	Number of hours taught further education	2009	FTE2
	Number of hours organised Bachelor	2009	volume
	Number of hours organised Master	2009	volume
	Number of hours organised further education	2009	volume
Scientific production	Funds for research obtained from SNF or other public funding agencies (CHF)	2009	FTE1
	Number of best paper awards obtained by members of the unit	2005-2009	HC2
	Number of international and high level scientific awards obtained by members of the unit	2005-2009	HC2
	Total number of publications (journal papers, book chapters, monographs, edited books; full count 1 per RU)	2005-2009	HC2
	Articles in scholarly journals	2005-2009	HC2
	Book chapters	2005-2009	HC2
	Monographs	2005-2009	HC2
	Edited books	2005-2009	HC2
	Total number of conference presentations	2005-2009	HC2
	Conference presentation in same linguistic region in CH	2005-2009	HC2
	Conference presentation in other linguistic region in CH	2005-2009	HC2
	Conference presentation in same linguistic region abroad	2005-2009	HC2
	Conference presentation in other linguistic region abroad	2005-2009	HC2
	Number of unit members that act as editor of a scholarly journal	2009	HC1
	Number of unit members that are members of an advisory board of a scholarly journal	2009	HC1
	Number of publications in international scholarly journals	2005-2009	HC2
	Number of publications in national scholarly journals	2005-2009	HC2
	Number of publications in peer-reviewed scholarly journals	2005-2009	HC2
	Number of publications in non-peer-reviewed scholarly journals	2005-2009	HC2
	Keynote speeches at scholarly conferences	2005-2009	HC2
	Special issues of scholarly journals edited by unit members	2005-2009	HC2
	Number of memberships of elected executive boards of scholarly associations	2009	HC1
Transfer public	Funds for research obtained from public and non-profit organizations (CHF)	2009	FTE1
	Number of memberships of commissions or boards of political or administrative authorities	2009	HC1
	Research reports for funding agencies, public and non-profit organizations	2005-2009	HC2
	Invited presentations for public or non-profit organizations	2009	HC2
	Number of articles and tv/radio transmissions written by or in which research activities of the research unit or its members are mentioned	2009	HC2
Transfer private	Funds for research obtained from private organizations (CHF)	2009	FTE1
	Number of memberships of executive and administrative boards	2009	HC1
	Research reports for private organizations	2005-2009	HC2
	Invited presentations for private organizations	2009	HC2

Table 2. List of all indicators and dimensions

A final set of data, required for the normalization and characterization of the RUs, concerns their basic characteristics. These include:

- The *list of people employed in the unit*, their employment duration and percentage and their use of time for the different activities (research, education, services). To this purpose, a list of employed

people was compiled with the help of the unit head and of administrative sources; data on the use of time by activity are based on the self-declarations of individuals.

- The identification of the *main scientific fields of activity* for each RU. To this purpose, each head of unit was given a list of fields within communication science and asked to indicate for each of them whether it is a main field, an important field or not present in the profile of the unit; this self-declaration was requested both for the current situation and for the situation envisaged for 3-5 years' time.
- The identification of the *strategic priority* of each dimension retained for the profiles, both in the current situation and that foreseen in 3-5 years' time; again, this was based on the self-declaration of heads of RU on a ten-point scale. This information is helpful in order to compare how the heads perceive their units with the measured profiles based on quantitative indicators.

Table 3 summarizes the structural information collected, its characteristics and main sources. Annex 1 provides complete information on each data.

Data	Characteristics	Source
List of employees	Start and end date of employment; percentage of employment; personnel category.	RU factsheet Reference: 2009
Time devoted to each activity	Percentage of time devoted to each activity (education, research, services).	Self-declaration (personnel survey). Reference: 2009
Scientific field of activity	Main/Important/Not relevant. Based on predefined list (option to add other subfields).	Head of unit interview. Reference: current status and foreseen in 3-5 years' time.
Strategic priority	Each domain of activity rated on a scale from 0 to 10.	Head of unit interview. Reference: current status and foreseen in 3-5 years' time.

Table 3. Structural information collected for each RU

3.5 Profiles, normalization and benchmarking

While the analysis of data on individual indicators is fairly straightforward, constructing comparisons between units raises some complex methodological problems; some of these are of a technical nature, but others relate to more conceptual issues. Besides discussing these questions with the accompanying group, the research team also performed a number of sensitivity analyses in order to check the robustness of the chosen normalizations (for an in-depth discussion the reader might refer to Probst *et al*, 2011).

Size normalization. Normalizing by size is an obvious requirement in order to compare small and large units on the same footing, especially for a sample where unit sizes differ widely. At the same time, a straightforward interpretation of the size-normalized indicators in terms of performance should be avoided, as size impacts systematically on productivity (most studies show that smaller units tend to be more productive than larger ones, e.g. because of the increase in internal coordination costs). Moreover, some RUs in the sample are so small that the individual performance of a single person can make size-normalized indicators misleading. For this reason, throughout the report we present indicators both in absolute values and size-normalized, as these provide largely complementary information.

However, there are different possible definitions of size and to some extent the unit's structure should be taken into account to avoid unfair comparisons. For example, consider a comparison between unit A – composed of three full-time professors and one PhD student – and unit B – composed of one full-time professor and three PhD students. Both have the same number of employees, both in headcount and full-time equivalents; however, to use the total number of employees for comparisons would be problematic in normalizing scientific production, as PhD students contribute little to output. Moreover, some outputs can be related to time spent (and thus to FTEs), while others are related to persons (and thus to headcounts).

As an outcome of this reasoning, we make use of four different size-related normalizations for the indicators:

- *FTE1*: Full Time Equivalents of professors
- *FTE2*: Full Time Equivalents of professors, lecturers, (senior) researchers and post-docs
- *HC1*: Headcount of professors
- *HC2*: Headcount of professors, lecturers, (senior) researchers and post-docs

It is important to note that the personnel category "PhD students and assistants" is always excluded from the normalization, as they are considered more as an output than an input in terms of the production of the RU considered; this seems appropriate in a field where dissertations are mostly individual and not related to participation in large projects, where PhD students might perform largely technical activities. In addition, some indicators on doctoral students are normalized against the number of doctoral students. The chosen normalization for each indicator is specified in Table 2.

In practical terms, the four normalizations used have a strong correlation, especially the ones which differ only by the use of HC vs. FTEs for the same categories of personnel (HC1/FTE1; HC2/FTE2). This means that a different choice of normalization would not significantly change our results.

	Correlation
HC1/HC2	0.83
HC1/FTE1	0.96
HC2/FTE1	0.75
HC1/FTE2	0.88
HC2/FTE2	0.94
FTE1/FTE2	0.86

Table 4. Correlation coefficient between the different normalizations for the whole sample
N = 19. Pearson correlation coefficient

Benchmarking. All types of comparison require a definition of the population with which to compare and a decision on how to build the benchmark. Our benchmark is based on the sample of RUs participating in the project – e.g. each RU is compared with the overall situation of Swiss communication science (as our sample is largely representative of the field). Of course, one needs to take into account that the field itself is characterized by a high diversity and thus there is no implication that individual RU should correspond to the average Swiss profile. As for some indicators – e.g. composition of publications – where there are wide differences between units, in some cases we also provide information on distributions in order to better interpret individual RU positions.

A second, more technical, issue relates to how the benchmark should be built; one might, for example, compare to the average of the sample, to the median or to the maximum, or provide information on ranks and position in quartiles. Each of these choices has a different meaning, e.g. comparing to the median relates the RU to a typical unit in the field, whereas to the maximum compares to the "best" one (and thus provides quite different information). Moreover, as distributional properties are quite different from indicator to indicator, the best choice might be different case by case. Normalizing against the maximum

value is very sensible with outliers (difficult to detect with few observations), adopting the distance from the average (or median) is problematic when distributions are non-normal, while percentiles inform on relative position, but not on distance from the better units.

In this report, most of the comparisons are made to the sample median and normalized against the standard deviation of the sample; this is a more robust measure than comparing to the average, which for a small sample is too sensitive to outliers. For many indicators, we also add a comparison to the maximum on a ten-point scale, as well as information on the rank of the unit in the whole sample.

Construction of profiles. Finally, the construction of profiles raises the issue of how to build composite indicators for each dimension. Two options are possible in this respect: to choose lead indicators considered as the most representative for each dimension or to weight the available indicators. After discussions with the accompanying group, the second option is preferred as the most reliable one.

Hence, the profiles presented in this report have been constructed as follows:

- First, for each indicator we calculate the benchmark against the whole sample either on the sample median or on the sample maximum.
- Second, we weight the individual indicators for each dimension to calculate a composite indicator. For the benchmark on the maximum, we perform renormalization on the maximum of the composite indicator in order build a scale from 0 to 10 for all dimensions.

Table 5 provides details on the weighting scheme adopted. We use the same procedure to construct both profiles based on absolute value – measuring the absolute contribution of each unit to the whole domain – and on size-normalized indicators. Thus, for each unit we get four different profiles – median and maximum, respectively absolute and size-normalized – which need to be compared and discussed carefully. The reader should refer to the methodological handbook for complete technical details.

Dimension	Indicators	Weight	remarks
Research training	Number of doctoral theses	1/2	
	Number of internal and external doctoral students	1/2	
Education bachelor	Number of theses	1/2	
	Number of hours taught	1/4	
	Number of hours organized	1/4	
Education master	Number of theses	1/2	
	Number of hours taught	1/4	
	Number of hours organized	1/4	
Education further education	Number of theses	1/2	
	Number of hours taught	1/4	
	Number of hours organized	1/4	
Scientific production	Funds from SNF or other public funding agencies	1/3	
	Number of scientific awards	1/3	Sum of best paper awards, scientific awards, journal advisory board, keynote speeches, special issues, boards of scholarly associations
	Total number of publications	1/3	
Transfer public	Funds from public and non-profit organizations	1/2	
	Public transfer total	1/2	Sum of commissions and boards, presentations, research reports, media presence (public)
Transfer private	Funds from private organizations	1/2	
	Private transfer total	1/2	Sum of boards, research reports, invited presentations (private)

Table 5. Weighting scheme for building the profiles

We notice that there is not necessarily a strong correlation between the individual indicators combined for each dimension, meaning that the choice of a different weighting scheme would lead to rather different RU profiles. This is especially the case for the science dimension, where the correlation between funds from public agencies and number of publications is only 0.18 and thus choosing a different mix – for example, excluding public funds from the composite indicator – would significantly modify the measured profiles.

Accordingly, profiles are useful tools for quick visualization of the different activity patterns of RUs, but a closer look at individual indicators might be required for an accurate interpretation.

3.6 Data collection, quality issues and data management

Data collection was composed of five different elements:

- An interview with the head of the RU, in which he was asked to indicate the current and future profile according to different dimensions (see below), as well as to indicate which research topics are covered by the RU
- A factsheet compiled by the RU, which includes factual information such as engagement in teaching or funded research projects, in addition to a list of all members of the RU
- An online questionnaire completed by all members of the RU, including information on individual output
- A publication list, prepared by the project team on the basis of existing publication databases or the CVs and publication lists of the researchers, checked and completed by the members of the RU
- Information on the media presence of the RU, gathered through a search for the name of the RU and its members in the databases Factiva and LexisNexis

Annex 2 to this report provides complete information on the data collection instruments.

Data collection is thus to a large extent based on self-declaration of the RU and its members, although the research team has taken much care in cross-checking the data from different sources and in providing detailed specifications of definitions. Some caution should be exercised in the analysis and interpretation of indicators, especially those where definitions might be interpreted in a slightly different manner by individuals – such as publication in peer-reviewed journals or scientific awards.

Once data have been collected, they have been checked systematically for inconsistencies; moreover, individual data have been coded according to the standard categories adopted for each indicator (see Annex 1 for full details). Publication lists required a specific treatment, as publications might have many authors; entries in the publication lists have thus been standardized in order to be able to remove duplicates and to analyze patterns of co-authorship.

Finally, the data have been integrated in a relational database programmed in MS Access, including a set of standard queries for extracting the indicators used for the analysis; this is necessary because of the relational structure of some data, but also for maintenance reasons if any of the data need to be corrected.

Figure 1 presents a relational structure of the database, while full documentation is provided in Annex 3.

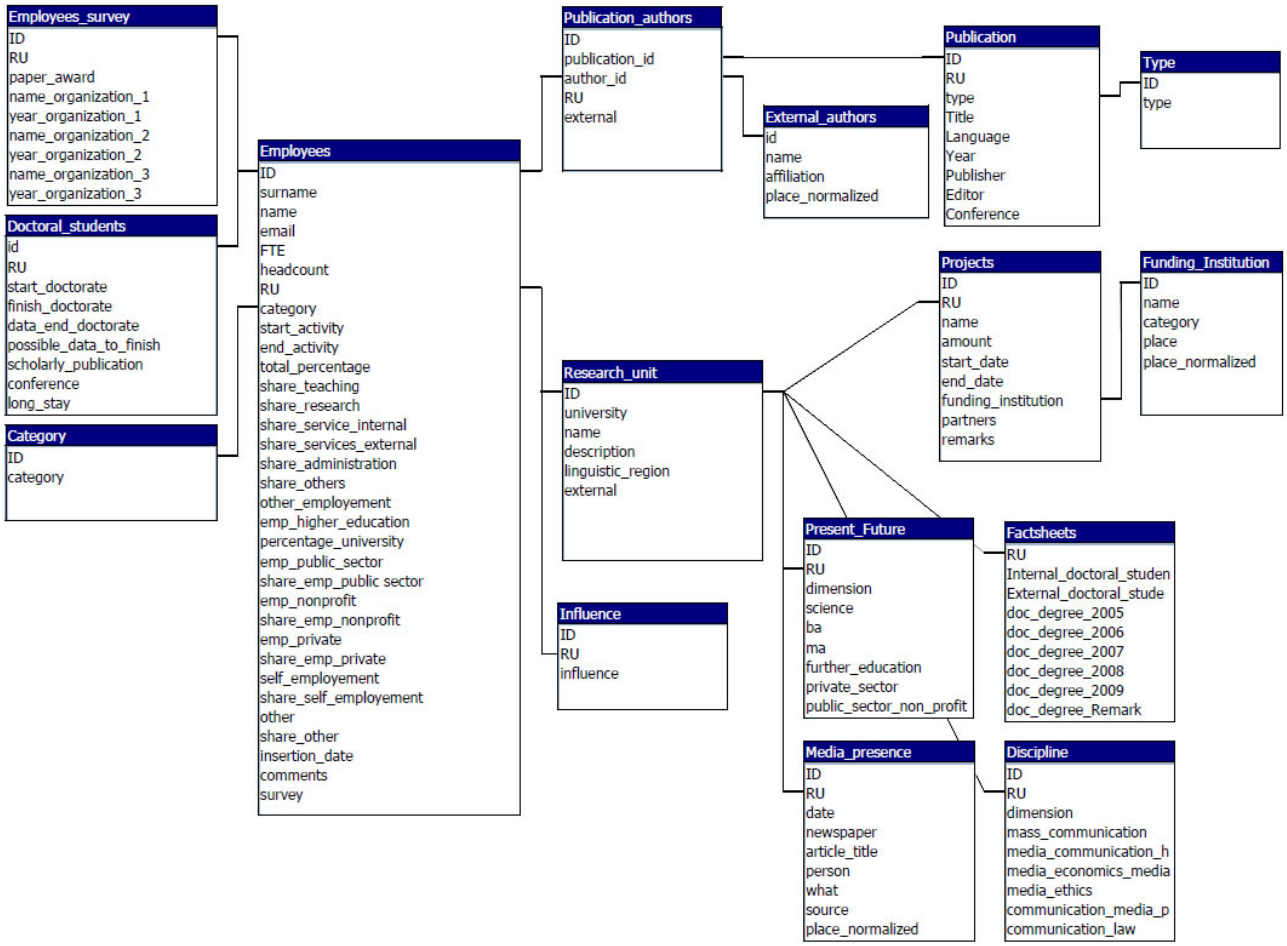


Figure 1. Structure of the database

4 Patterns of activity in Swiss communication sciences

In this chapter, we provide an overview of the activities and products of the units at an aggregate level. As the sample covers most of the field of Swiss communication sciences, this can be considered a reasonably reliable picture of what activities are currently performed and thus as an update and a more systematic analysis than those performed in the past – e.g. in the evaluation of the field realized by the SGKM itself (SGKM Schweizerische Gesellschaft für Kommunikations- und Medienwissenschaft, 2004).

Where possible, we provide a few comparisons with the whole domain of social sciences and humanities (SSH) by using data from the Information System on Swiss Universities (SIUS) managed by the Swiss Federal Statistical Office (SFSO). While some units in our sample might be classified under economics rather than SSH, we consider that these comparisons could be helpful in providing a glance at the position and size of communication within the Swiss research landscape. We notice also that no direct comparison is possible between our data and that of the SFSO on the field of communication, as their coverage is likely to be quite different.

The chapter begins with a general overview of the field, based on existing literature and studies. In the following sections we provide information on the main activity domains considered in the project, namely resources (personnel and funding), education, research training, scientific production, and public and private transfer activities. We conclude the chapter with a final discussion of the main characteristics of the field and of its general patterns of activity.

4.1 A helicopter picture of the field

The "Zukunftskommission Medien- und Kommunikationswissenschaft", established by the CRUS and composed of representatives from the field of communication and media sciences in Switzerland, describes the field as mainly concerned with "den Rahmenbedingungen, Systemen, Prozessen, Veränderungen, Inhalten, Leistungen, Funktionen, Nutzungen und Wirkungen der öffentlichen Kommunikation, aber auch dem Wandel und den Effekten der nichtöffentlichen Individualkommunikation"[1] (Zukunftskommission, 2006), thereby underlining the diversified nature of the field with inter- and transdisciplinary references (Saxer, 2007).

Over the last few decades the field of communication sciences, sometimes operating under different names[2], has developed dynamically in Switzerland. It is characterised on one hand by *differentiation regarding research traditions*, but also through *linguistic and cultural segmentation* (Bonfadelli and Bollinger, 1987, Schönhagen, 2008), which complicates an inventory and analysis of research output.

Regarding *research traditions, approaches and methods* a basic distinction can be made between a *social sciences approach*, based on public communication and empirical methods, and a *cultural studies approach*, looking at different types of media and their analysis. Additionally, there are mixed approaches with orientations towards economics, information sciences, linguistics, psychology or sociology (Zukunftskommission, 2006).

The segmentation of the field in terms of *linguistic regions* has been demonstrated by Probst & Lepori (Probst and Lepori, 2007, Lepori and Probst, 2009) through an analysis of institutional documentation, CVs and publication lists of professors. A clear separation in terms of language and content is visible between the German and French speaking parts of Switzerland. Individual research units position themselves within

1 "the framework, systems, processes, changes, contents, achievements, functions, uses and effects of public communication, but also the changes and effects of non-public individual communication"

2 For example, in the German speaking area, *Publizistik(wissenschaft), Kommunikationsforschung, Medienforschung, Kommunikationssoziologie, Kommunikationsmanagement* or earlier also *Zeitungskunde* (DGPuK Deutsche Gesellschaft für Publizistik- und Kommunikationswissenschaft, 2001, Romano, 2006), in the French speaking area *sciences de l'information et de la communication*, (Froissart and Cardy, 2005) or simply *Communications*, as for example in the Subject Category of Web of Science.

their own linguistic region, including across national borders; connections to the English speaking world are mainly found in St. Gallen and Lugano. Collaboration between linguistic and disciplinary groups, however, is rather low (Saxer, 2007).

Today, university education in the field mainly focuses on an analytical perspective in a social sciences approach. The training of journalists is no longer a central aspect in many places (Süss, 2000, Marr, 2007)[3]. Individual universities, particularly in the French-speaking part of Switzerland, offer some journalism training in the context of a minor at the Bachelor's level (University of Fribourg, "Journalisme et Médias"), as "Master in Journalism" (Neuchâtel) or as a minor within a whole study course ("Master en sciences de la communication et médias: mention journalisme", University of Geneva). The main players in journalism training in the German-speaking part are (Fach)Hochschulen, which specialize in this field. For example, the MAZ in Lucerne offers a "Master in Journalism" or an extra-occupational study course in journalism for people holding a vocational training degree giving access to higher education (Berufsmaturität). The *Zürcher Hochschule für Angewandte Wissenschaften (ZHAW)* offers a Bachelor's with majors in journalism and organizational communication.

When looking at the field and its developments from a *historical* point of view, it emerges that, especially in the German-speaking part of Switzerland (in a similar way to developments in Germany), the central focus on journalism opened into a *social sciences* oriented *Publizistik* at the beginning of the 1970s. This happened particularly in Zurich and Fribourg and was also the period in which the Swiss Association of Communication and Media Research was established. Further clusters in a later development are, for example, *media studies with a cultural studies orientation* in Basel and a rather *economics oriented* perspective in St. Gallen (Schönhagen, 2008).

In the *German-speaking area*, aspects of communication were included at the *University of Zurich* since 1902. The "Journalistisches Seminar" at the faculty of law and political science was established in 1923; in 1973, it became the "Publizistisches Seminar", and from 1983 on it was called "Seminar für Publizistikwissenschaft", located at the Faculty of Philosophy I (Bonfadelli and Bollinger, 1987: 4). In this way it has left its original orientation towards journalism. Today, it is called the "Institut für Publizistikwissenschaft und Medienforschung" and is organised in seven departments, offering a broad range of education oriented towards social sciences, leading to Bachelor's or Master's degrees in Social Science in Publizistik- und Kommunikationswissenschaft or the specialised Master's in Kommunikationsmanagement und Kommunikationsforschung.

The universities in Bern and St. Gallen do not offer independent study courses in communication science. The Institut für Kommunikations- und Medienwissenschaft at the *University of Bern* belongs to the department of social sciences within the faculty of social sciences and economics; it offers "Kommunikations- und Medienwissenschaft" as part of a Bachelor's in social sciences, both as major and minor. It was established in 1989 and consists of a full-time professorship in political communication. Teaching in the field of Zeitungswesen (press) has existed since 1903, with interruptions. With the Institute of Media and Communications Management, established in 1998, the *University of St. Gallen* offers courses oriented towards communication as a complementary offer to the Bachelor's with Major in Business Administration and to the Master's in Marketing, Services and Communication Management. Its orientation is towards economics, with courses adapted to the needs of students in business administration.

The bilingual *University of Fribourg* first offered the subject "Zeitungskunde und Publizistik" in 1942. The "Institut für Jounalistik und Kommunikationswissenschaft" (also bilingual) at the faculty of law, economics and social sciences was established in 1966. While it was created as a training school for journalists it also included – with the new chair founded in 1982 – social science oriented communication research. Since 2003 the educational offer, in strong demand by students, was enlarged towards a broader Medien- und Kommunikationswissenschaft with a social science focus.

[3] An exception to this is the University of Neuchâtel with its Académie du journalisme et des médias, which focuses on training of journalists and managers for media organizations.

A cultural studies oriented course of Medienwissenschaft at both Bachelor's and Master's level is found at the *University of Basel;* it was institutionalised in 1995 as a minor, and has been offered also as a major since the foundation of the Institut für Medienwissenschaften at the Faculty of Humanities in 1999.

Regarding the *French-speaking part of Switzerland*, a transition period can be detected, with new programs and structures currently being implemented (Viallon, 2008). Generally, a strong focus on *sociology* is found in this area. From 1970, the Institut de sociologie des communications de masse was established at the *University of Lausanne*, which has devoted its forces more strongly towards sociology. The roots of education in communication sciences at the *University of Geneva* are found in 1978. Today's offer includes a Master's en sciences de la communication et des médias, whose basic elements include aspects of social sciences. As mentioned above, since 2008 the *University of Neuchâtel* offers a Master's in Journalism, through its Académie du Journalisme et des Médias at the faculty of economics. Journalism was first offered here as early as 1959.

The faculty of communication sciences at the only *Italian-speaking university of Switzerland in Lugano* is manifold in its disciplinary orientation and focuses on interdisciplinary discourse (Eppler, 2008). The University of Lugano offers a Bachelor's with social sciences orientation in Italian. The specialized and multifaceted Master's study courses are found mainly in the fields of business and communication management. The Istituto di scienze sociali della comunicazione, founded in 1997, was the first institute of this faculty, which has grown steadily both in terms of human resources and its institutionalization; today, more than 20 professors are employed in nine institutes and five laboratories/observatories.

In summary, it is clear that the institutional basis of the field in Switzerland is fairly broad (Romano, 2006), but that there is diversity between different higher education institutions. Units in communication sciences are found at different hierarchical levels; the spread ranges from a subfield or course provider for other fields or programs within a department, through a department/institute up to a whole faculty. On the other hand, disciplinary research traditions, basically divided into the main clusters *social sciences* vs. *cultural studies* and economic or sociological focus, can be found across linguistic borders. These factors demonstrate the challenges for an evaluation of research output in the field of media and communication sciences. Therefore, it seems more sensible to compare similar profiles, in order to respect specific contextual factors.

4.2 Summary data and headlines indicators

An overview of the sample is given in Table 6 indicating the total volume of resources and activities declared by the 19 RUs (covering a significant part of the whole field in Switzerland).

Dimension	Indicator	Total
Sample composition	Number of Rus	19
	Universities covered	7
Human resources	Total FTE	148.20
	Professors (FTE)	29.71
	Lecturers / senior researchers / post docs (FTE)	37.53
	Doctoral students (FTE)	80.20
Human resources	Total Headcount	250
	Professors (Headcount)	41
	Lecturers / senior researchers / post docs (Headcount)	61
	Doctoral students (Headcount)	148
External funding	Total funds from public agencies (CHF)	2'408'439
	Total funds from public and NPO's (CHF)	2'826'158
	Total funds from private organizations (CHF)	477'485
Research training	Number doctoral theses	83
	Numbers doctoral students	158
	Numbers hours organized PhD	650
	Numbers hours taught PhD	424
Teaching Bachelor	Numbers theses	449
	Numbers hours organized	7708
	Numbers hours taught	5900
Teaching Master	Numbers theses	256
	Numbers hours organized	8154
	Numbers hours taught	4693
Teaching Further Education	Numbers theses	32
	Numbers hours organized	1502
	Numbers hours taught	324
Science	Funds from public agencies	2'408'439
	Total numbers publications	1'299
	Total numbers scientific awards	179
Private	Total funds from private organizations (CHF)	477'485
	Presentations to private companies	51
	Research reports	53
Public/non profit	Total funds from public and NPO (CHF)	2'826'158
	Presentation to public and NPO	96
	Research reports	184
	Media presence	88

Table 6: Summary data for the whole sample

This overview gives a quick glance at a few general characteristics of the field of communication sciences in Switzerland. It shows that most of the external funding in the field stems from public and non-profit organizations or public funding agencies (mostly the Swiss National Science Foundation), while private organizations account for a much lower share. This distribution is also evident in terms of collaboration with public/non-profit or private organizations. On the teaching side, the importance of individual research units in specialised Master's is visible, while in Bachelor's education it is likely that a good deal of the teaching is organized at a central level. More details on the individual units and on the sample as a whole are presented and discussed in the following sections.

METHODOLOGICAL NOTE

Most data presented in this report refer to the calendar year 2009 or to the 31.12.2009 respectively (e.g. staff composition). The exceptions are a few indicators for which data from a single year would not be very significant given the size of the unit – for these the data refers to the period 2005-2009. This includes the number of doctoral theses, scientific publications and conferences, as well as research reports. For detailed information on methodology refer to chapter 3 of this report

4.3 Resources: personnel and financial resources

In this section we provide a short summary of the resources available in the field, by focusing on staff and external funding.

4.3.1 Personnel resources

As Figure 2 shows, the distribution of staff in the field is largely skewed, with more than half of the workforce composed of assistants and PhD students and the rest being divided almost equally between professors on one side, and senior researchers and post-docs on the other.

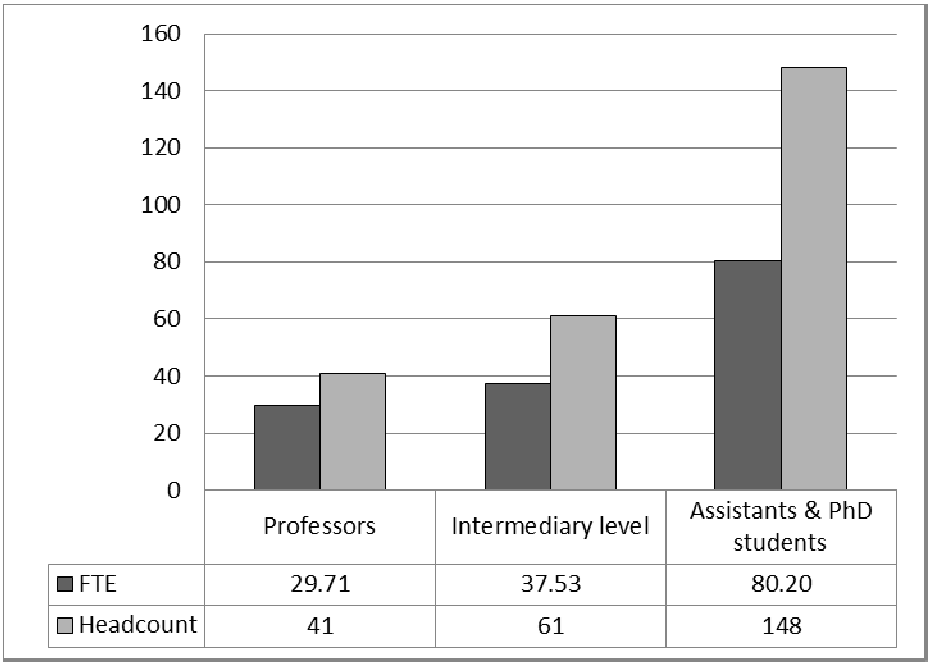
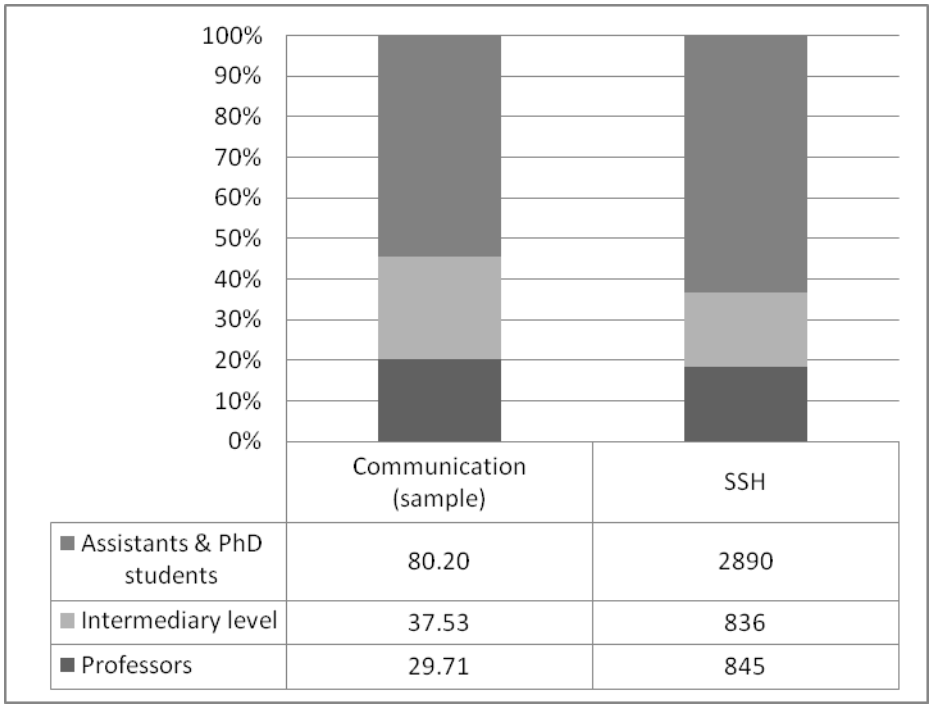


Figure 2. Distribution of personnel among categories, whole sample, 2009

When comparing this data to the overall situation in the social sciences and humanities in Switzerland (data from SFSO, see Figure 3), it becomes clear that the composition of personnel is broadly comparable with the whole field (taking into account that the personnel categories are not exactly the same as in the Swiss data, where the category of assistants also includes *Oberassistenten/Maître assistants*, which in our sample are attributed to the second category for analysis due to conceptual reasons).

The data also shows that in our sample, unsurprisingly, assistants and lecturers/senior researchers/post-docs on average have lower employment contracts than professors (54% for assistants, 61% for lecturers/senior researchers/post-docs and 72% for professors). These differences are much more pronounced in the overall field of social sciences and humanities in Switzerland, where on average 90.13%

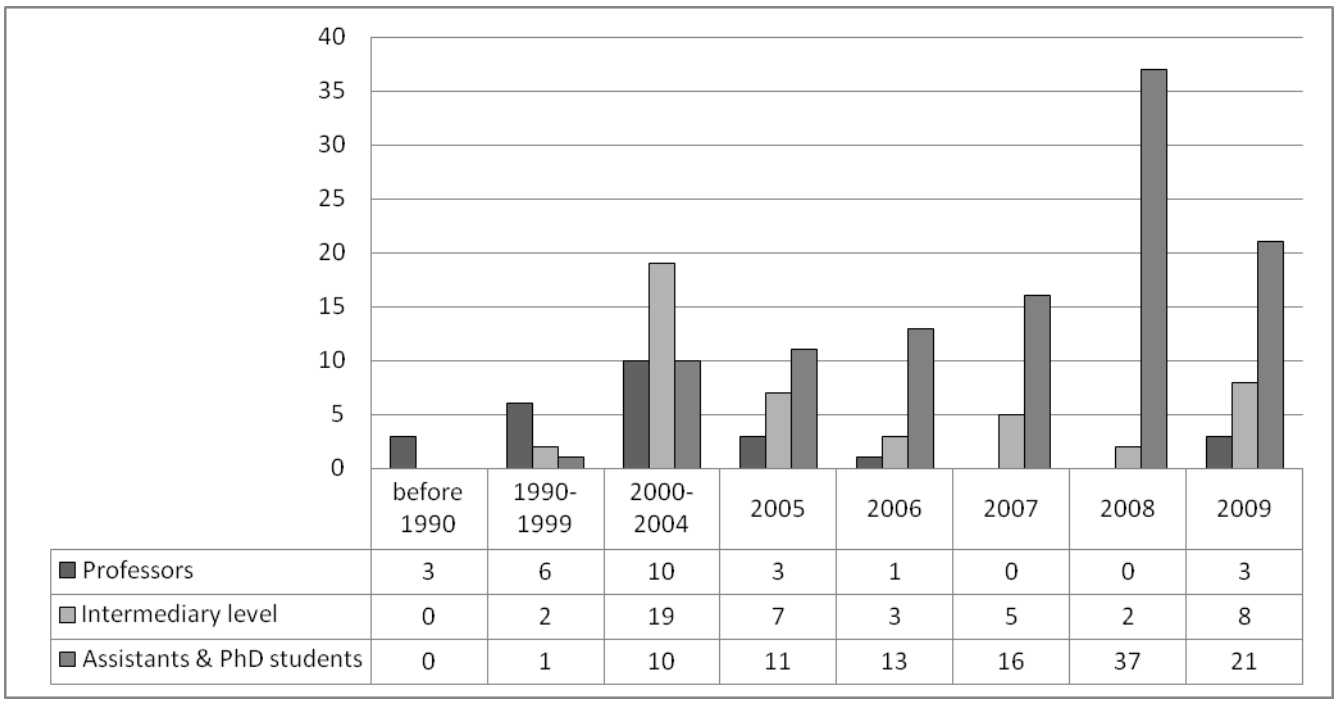
of professors have working contracts, 39.44% of lecturers/senior researchers/post-docs and 59.48% of assistants.



	Communication (sample)	SSH
Assistants & PhD students	80.20	2890
Intermediary level	37.53	836
Professors	29.71	845

Figure 3: Distribution of personnel among categories, Full Time Equivalents 2009, sample vs. SSH in Switzerland
source for SSH: Swiss Federal Statistical Office, Personal der universitären Hochschulen, Basistabellen 2009

Expected differences between the three categories are also evident when looking at how long individuals have been employed in their unit (Figure 4). 73% of the professors and 45% of the intermediary level staff (including senior researchers, lecturers and post-docs) have been employed in the same RU for at least 5 years, while 53% of the assistants and PhD students have been employed for less than two years.



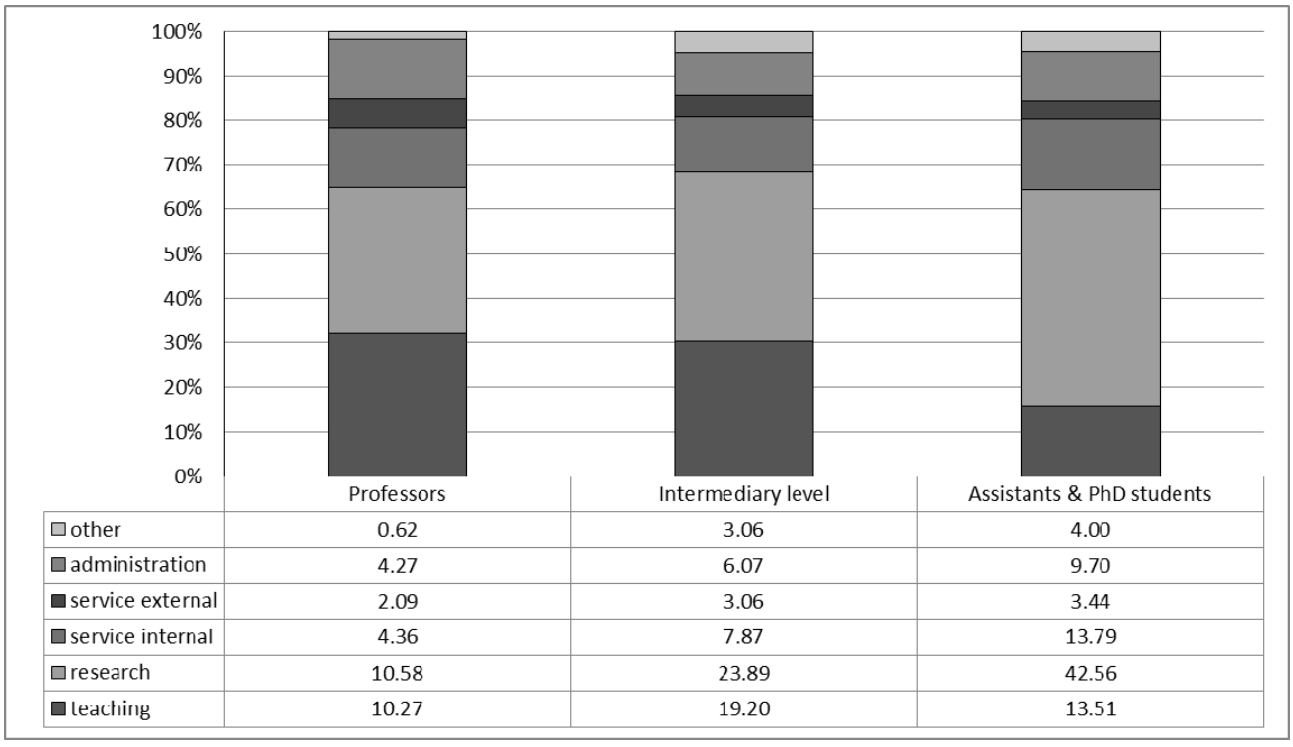
	before 1990	1990-1999	2000-2004	2005	2006	2007	2008	2009
Professors	3	6	10	3	1	0	0	3
Intermediary level	0	2	19	7	3	5	2	8
Assistants & PhD students	0	1	10	11	13	16	37	21

Figure 4: Start of employment in research unit, whole sample, headcount

These differences clearly reflect different levels of stability by category of personnel; interestingly, the significant expansion of the field around the year 2000 is reflected in the large share of professors being nominated in that period, while only a few professors have been hired after that date. However, some care is required here as internal promotions are not considered in the data (e.g. a post-doc working since 2000 in an RU who has been promoted to professor status more recently).

4.3.2 Use of time

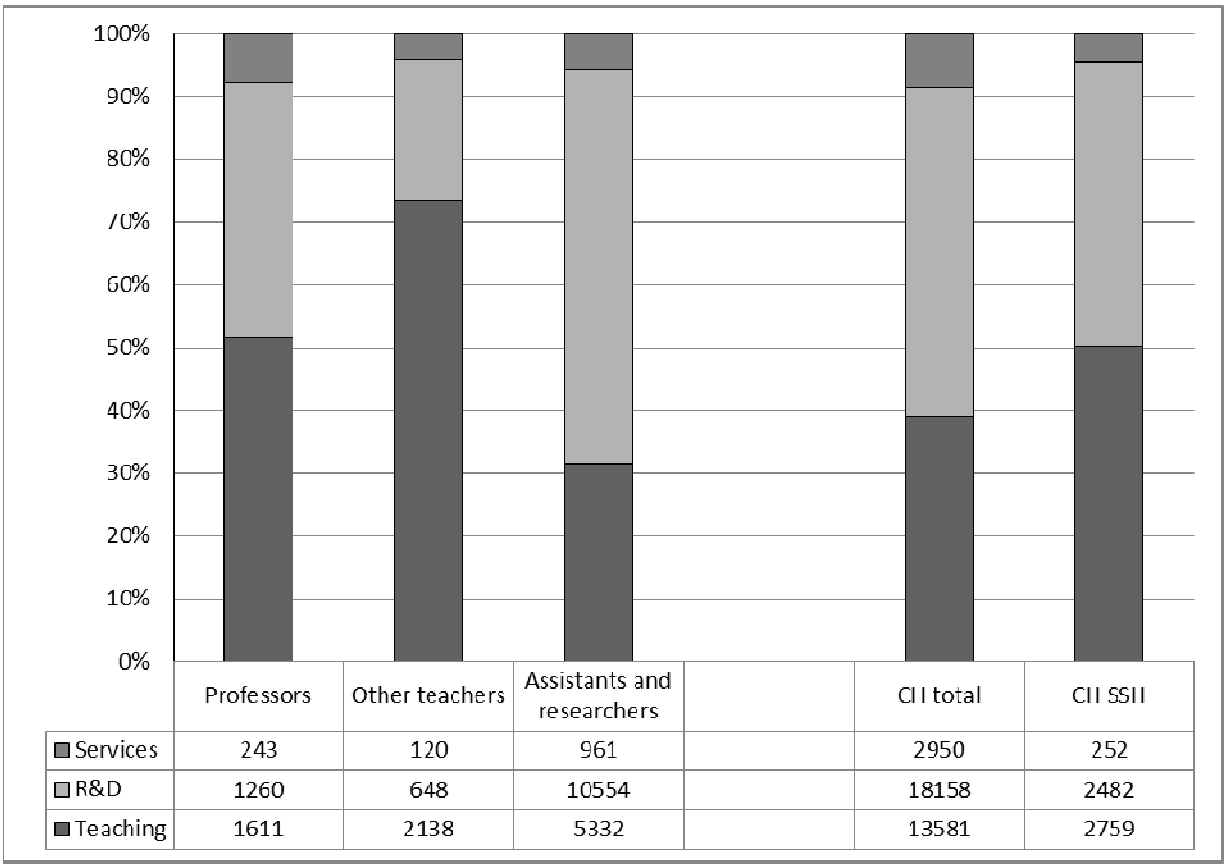
When looking at use of time – as declared by the individuals themselves – 44% of the working time is devoted to research and 23% to teaching; however, the percentage of time devoted to research is 34% for professors and 49% for doctoral students. Even if these data should be treated with some care, it appears that professors and intermediary staff bear most of the burden of educational activities, whereas most of the work in research is performed by doctoral students. However, with more than 30% of their time, the share of time devoted to research by professors – at least based on their self-declaration – is rather large. Interestingly, the time devoted to teaching is somewhat low in our sample – despite the fact that communication sciences is generally recognized to be a teaching intensive field with high student/teacher ratios. However, it could be that other duties related to education have been included under administration instead.



	Professors	Intermediary level	Assistants & PhD students
other	0.62	3.06	4.00
administration	4.27	6.07	9.70
service external	2.09	3.06	3.44
service internal	4.36	7.87	13.79
research	10.58	23.89	42.56
teaching	10.27	19.20	13.51

Figure 5: Time used for different activities by type of personnel
Whole sample, data in FTE

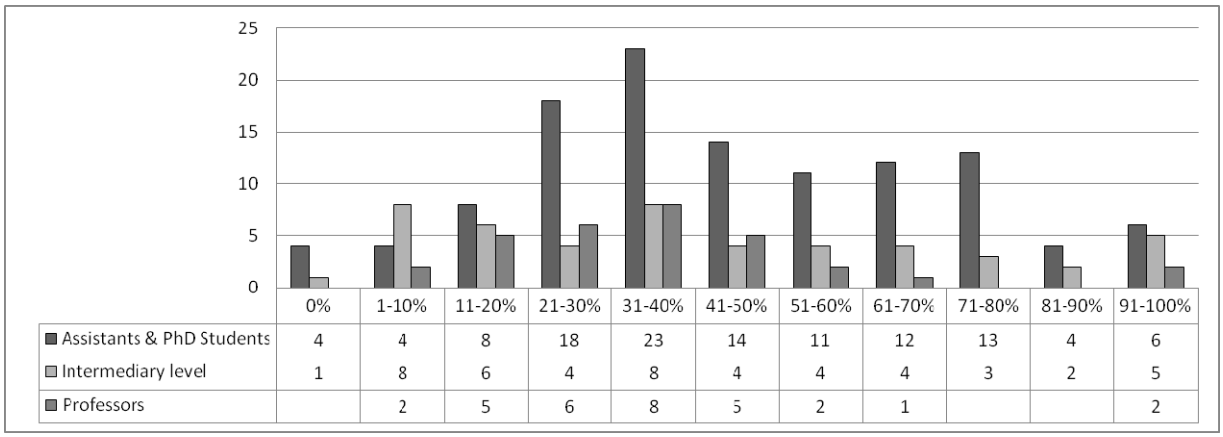
Similar data is available from SFSO (Figure 6). When comparing our sample with the whole of academia in Switzerland, a clear difference that emerges is the share of time devoted to services. This might be due to the way in which the question was asked: while data from Swiss Statistics distinguished between three teaching levels, our data distinguishes between different types of services and also includes administration.



	Professors	Other teachers	Assistants and researchers		CII total	CII SSII
Services	243	120	961		2950	252
R&D	1260	648	10554		18158	2482
Teaching	1611	2138	5332		13581	2759

Figure 6. Time used for different activities, FTE by personnel category, all fields
source: Swiss Federal Statistical Office, Personal der universitären Hochschulen, Basistabellen 2009

Although generally speaking the representation of a field where little research is done and the professors are overburdened by teaching duties does not hold, it is interesting to examine whether there are differences among individuals and, therefore, signs of people specializing in different tasks. Accordingly, Figure 7 displays the distribution of time for research at the individual level.



	0%	1-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
Assistants & PhD Students	4	4	8	18	23	14	11	12	13	4	6
Intermediary level	1	8	6	4	8	4	4	4	3	2	5
Professors		2	5	6	8	5	2	1			2

Figure 7. Time for research: distribution by persons and share of time dedicated to research, N=197

Overall, the distribution is quite concentrated around the average time for research, especially for professors (average = 33%). The spread is, however, much larger for assistants and doctoral students, where there is a significant group working only in research, while 34 out of 117 persons declared a research share of less than 30% (which should probably be considered the minimum for a PhD student). We also notice that 1/4 of the professors in the field declare that less than 20% of their time is devoted to research activities.

The overall conclusion is that research activities are spread throughout the whole field and the different personnel categories, including professors, but that there is a small group of individuals working in the field who – if we trust their declarations – don't reach a minimum threshold for research activities. Also, some concern should be raised by the rather large number of PhD students and assistants with a low proportion of research, especially in view of their dissertation work.

4.3.3 Funding acquisition

A further relevant characteristic is the ability of units to acquire external funding. As explained in the methodology, we divide external sources into three main groups:

- Funding from competitive funding agencies which are oriented mostly towards the production of new knowledge; this includes all Swiss National Science Foundation programs, as well as European programs.
- Funding from public and non-profit organizations for their own needs (e.g. development of policies); this includes contracts from the public administration sector, different types of private foundations, and public media organizations.
- Funding from private organizations for their own needs (e.g. development of new products, improvement of organizational processes etc.); this consists mainly of contracts from private companies.

As Figure 3 shows, the RUs in the sample receive substantial amounts of resources from public agencies and organizations, whereas contributions from private organizations are much more limited. The total amount of 5.7 mio CHF for the year 2009 is quite high considering that the whole field has a total personnel resource of only 148 FTEs; a very rough calculation shows that this amount of external funding would directly finance the salaries of all PhD students and research assistants, as well as a share of the intermediary level personnel.

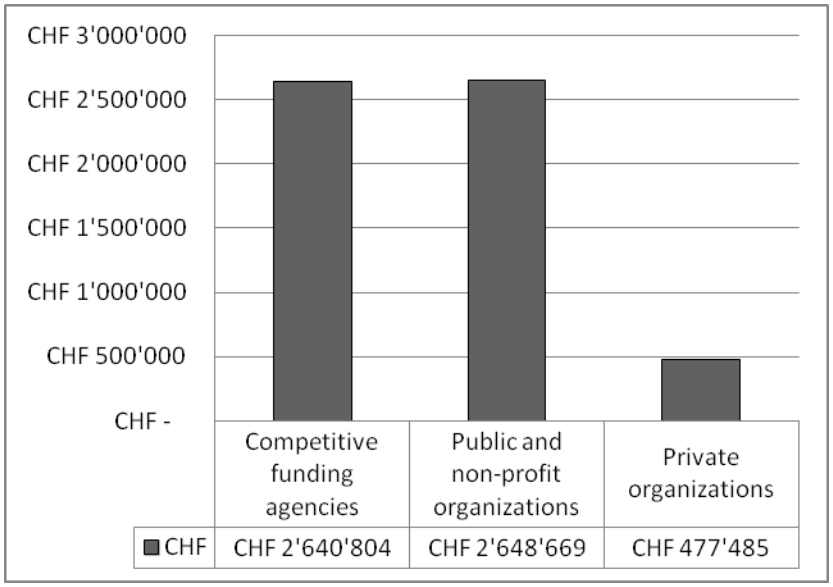


Figure 8. External funding
Total for the whole sample, amount for 2009, CHF.

A more detailed breakdown shows that most public agency funding does in fact come from the Swiss National Science Foundation, whereas contributions from public and private organizations are divided between many different organizations, the only relevant exception being grants from the Swiss Federal Office for Communication.

Category	Funding organization	Amount 2009 (CHF)

Public agencies	Swiss National Science Foundation	2’133’000.
	Swiss Innovation Agency	232’000
	EU framework programs	275’000
Public organizations	BAKOM	489’000

Figure 9: Third-party funding divided by source, most important funding bodies
Total for the whole sample, amount for 2009, CHF

As Figure 10 displays, public and private funding is quite evenly divided between national sources – federal offices, national media, etc. – and regional sources, whereas international funding sources have a very limited importance.

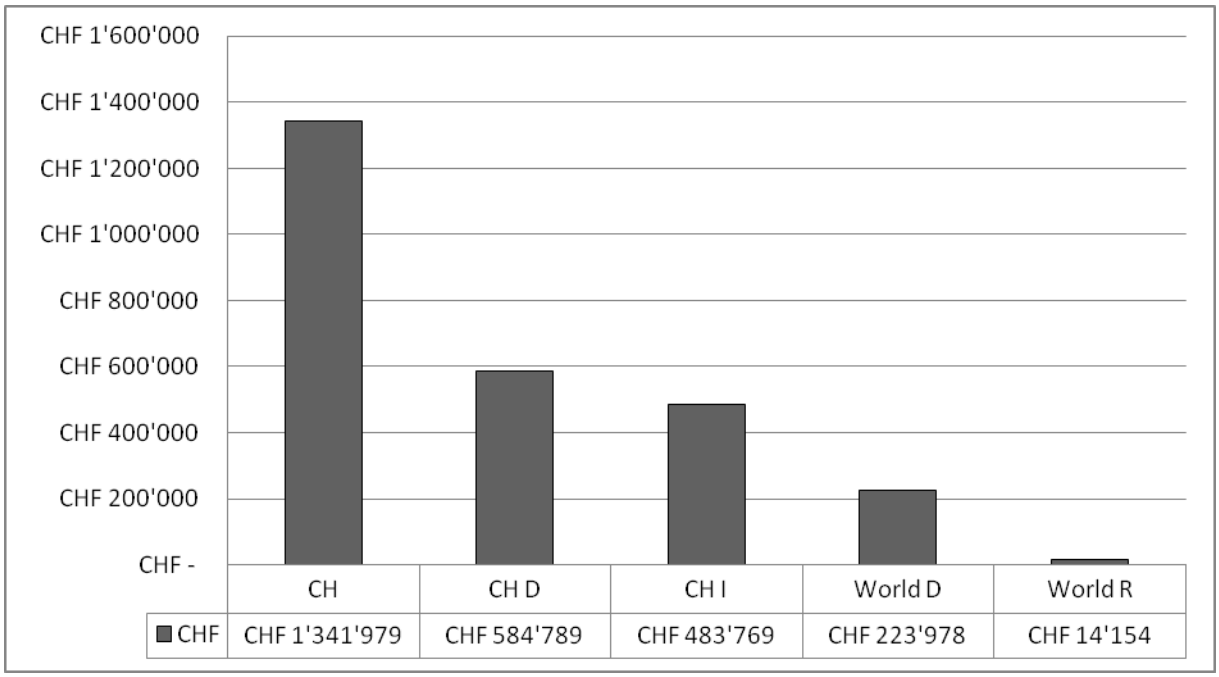


Figure 10: Funding from public and non-profit organizations, divided by place of organization
Total for the whole sample, amount for 2009, CHF
CH = national organizations, like federal offices.

4.4 Educational activities

Swiss communication science is known for the rapid increase in the number of students and courses on offer throughout the last two decades. On average, an RU in the sample organized 914 teaching hours during the year 2009 (including hours taught by members of the unit, and by external teachers within curricula organized by the unit), while unit members taught for 575 hours. Figure 11 indicates the total amount of hours organized and taught in the sample. The difference between hours organized and taught shows that recourse to external teachers is very important in Master’s and, especially, in further education curricula. Most educational activities are concentrated at the Bachelor’s and Master’s level, while just a few units are active in further education.

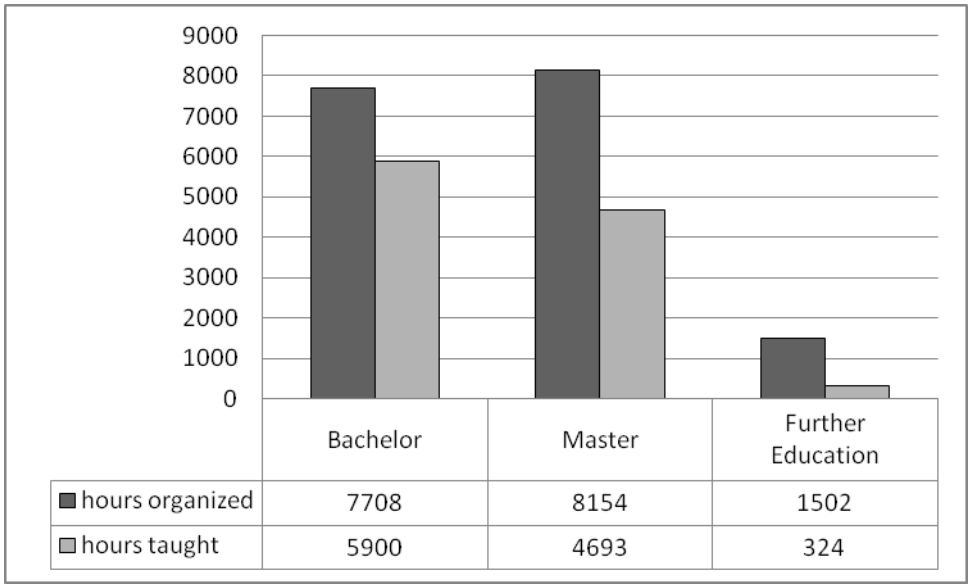


Figure 11. Total number of hours taught and organized in 2009
Absolute values, total of the 19 RUs.

Figure 12 gives more detail on the difference between hours taught and organized: it indicates where external teachers come from and also shows the external teaching activities of RU members. Overall, there are more incoming than outgoing teachers. The proportion of teachers crossing linguistic borders is surprisingly high when considering the linguistic separation of the field: 44% of all RU members teaching at other units do so in another linguistic region, either in Switzerland or abroad, and 45% of all incoming external teachers stem from another linguistic region.

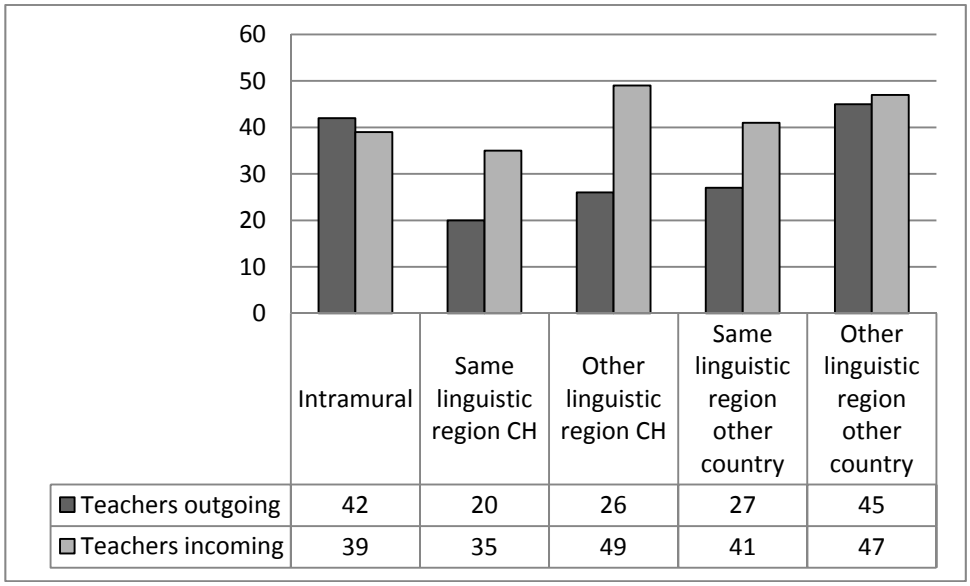
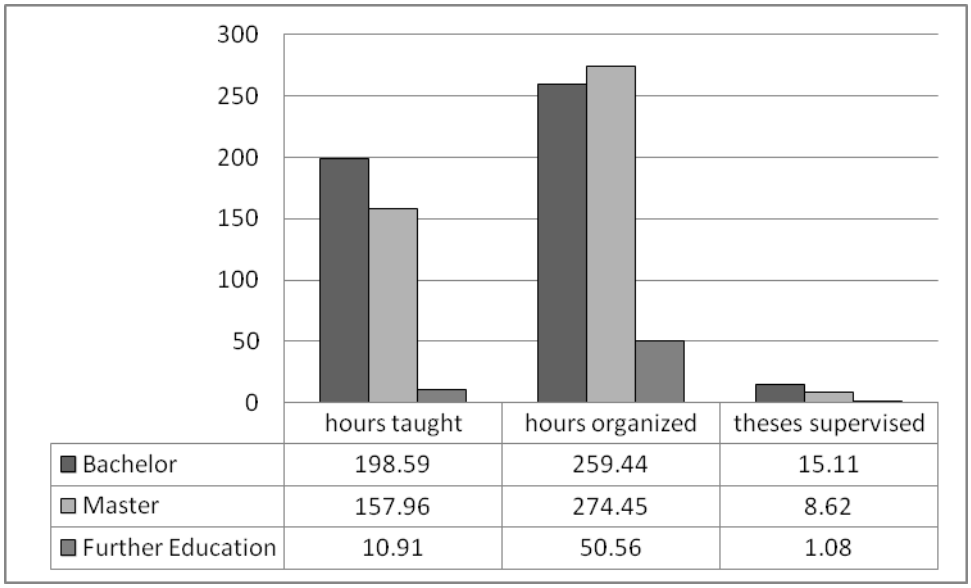


Figure 12: Incoming and outgoing teachers, headcount, 2009

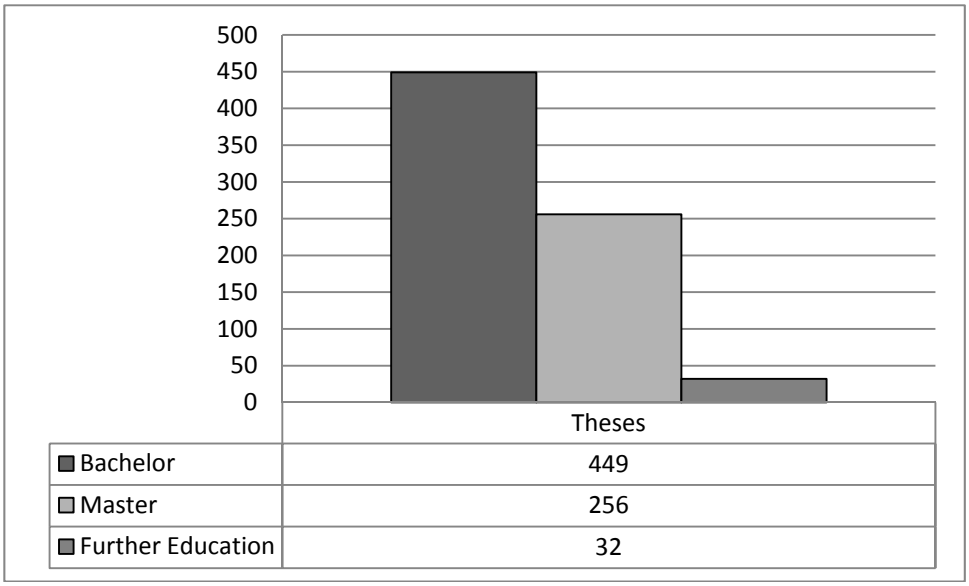
On average, a professor/senior researcher/post-doc taught about 162 hours in 2009, mostly at the Bachelor's and Master's levels; if we assume that post-docs and senior researchers are not as active in teaching and thus normalize only by the number of professors, this number rises to 367 (see Figure 13 for more details).



	hours taught	hours organized	theses supervised
Bachelor	198.59	259.44	15.11
Master	157.96	274.45	8.62
Further Education	10.91	50.56	1.08

Figure 13: Average number of hours taught and organized and theses supervised per professor in 2009
Data normalized against FTE of professors.

A second dimension of educational activity is supervising students' theses; the Bologna reform has expanded this area as many higher education institutions now require theses – or a similar work done during a seminar – both at the bachelor's and master's level. As Figure 14 shows, the introduction of theses at the bachelor's level has led to a substantial increase in the total number of theses to be supervised.



	Theses
Bachelor	449
Master	256
Further Education	32

Figure 14. Total number of theses
Absolute values, total of the 19 RUs.

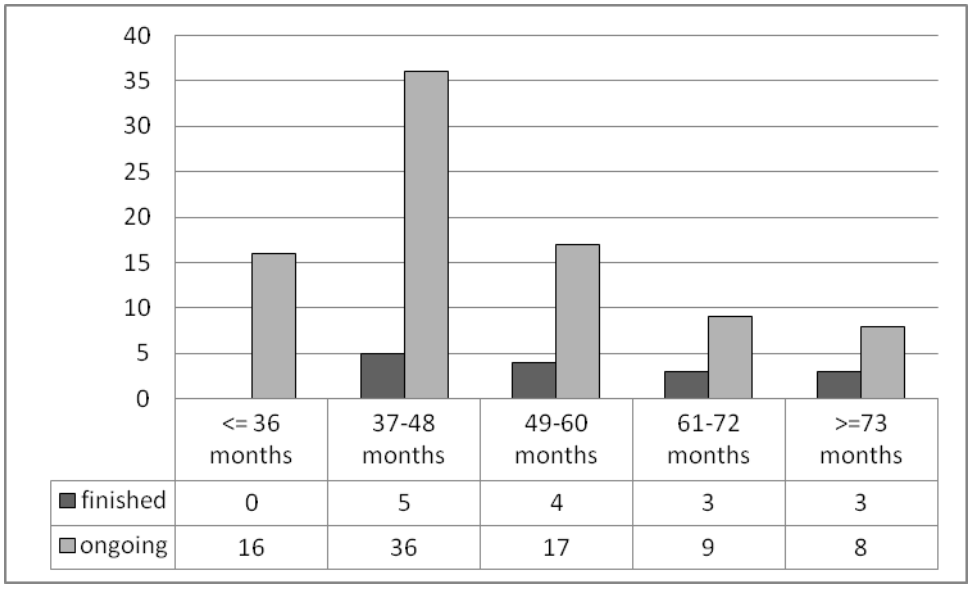
4.5 Research training

Data indicates that the training of doctoral students represents a major activity in Swiss communication science. Overall, in the year 2009, the 19 units under consideration enrolled 158 doctoral students, of which 109 had a working contract with the unit, whereas 49 were external; this means that on average each professor had more than 5 doctoral students. During the reference period (2005-2009), 83 doctoral theses were concluded – about 16 per year. This number is rather low compared with the total number of doctoral students. There are some possible explanations for this: firstly, the number of doctoral students could have increased substantially in the most recent years, as an effect of the strong increase in the field

over the last decade; secondly, the time taken to complete a doctorate could be quite long; and thirdly, drop-out rates could be high. Further information is therefore needed to explain these data.

Of the 109 internal doctoral students, 107 are contained in the database and thus answered specific questions on their doctorate. The following information is based on this sample.

In the questionnaire, doctoral students were asked to indicate the starting date of their doctorate, and when they finished it, or planned to finish it. Those who had already finished the doctorate at the time of answering the questionnaire (n=15) indicate an average doctorate duration of 60.2 months, i.e. 5 years. Out of the 92 doctoral students that had not yet finished, 86 answered the question regarding their foreseen completion date[4]. Here, the average estimated duration is 48.6 months, i.e. one year less than the finished sample. Doctoral students therefore seem to be more optimistic about a shorter duration of their doctorate than reality would suggest.



	<= 36 months	37-48 months	49-60 months	61-72 months	>=73 months
finished	0	5	4	3	3
ongoing	16	36	17	9	8

Figure 15. Foreseen duration to finish the thesis; doctoral students in the sample
Finished: exact duration of doctoral students that had finished their doctorate before answering the questionnaire
Ongoing: estimated duration of doctoral students still in the process of their doctorate.

The doctorate, however, is a degree that is widely discussed in general in the world of higher education. This discussion is also taking place in Switzerland, where the ProDoc program of the National Science Foundation and the CRUS has led to the establishment of several graduate school-like doctoral programs, especially in the fields of social sciences and humanities. Some of them also cover communication sciences. Within these programs, where the doctorate becomes more tightly organized, with clearer rules and deadlines, and where supervision tends to be the responsibility of more than one person, it is likely that the duration of the doctorate will shorten.

On average, doctoral students in the sample have been fairly productive (taking into account that the sample also includes beginners); about 66% of them indicate that they have had at least one publication (journal paper, book, book chapter) so far during their doctorate, and 73% have already presented at a scholarly conference. Only 19% of the doctoral students had neither a publication or conference presentation, although career stage might be a factor in this share of students.

International mobility of doctoral students was low during the reference period, with only 18% of the sample taking a stay abroad of more than 1 month. However, this average is somewhat misleading, since 13 out of the 19 stays abroad were taken by students from different RUs in a single university, Lugano,

[4] Where a month was indicated, the end of this month was taken as reference. Where a year was indicated, the end of this year was taken as reference. Where a period (e.g. end 2010/2011) was indicated, the middle of this period was taken as reference.

where doctoral students are strongly encouraged to go on visits abroad, where the financial support for such stays is good and where there is, to some extent, a culture of spending time abroad during the doctorate.

4.6 Scientific community

The dimension covering output towards the scientific community is divided into two main parts: publication output – probably the most typical and also most studied type of output – and academic awards.

4.6.1 Analyzing publication output

Overall, the 19 RUs in the sample have produced 1299 scientific publications during the period 2005-2009, as well as 1162 conference presentations (see Figure 16). Compared to the usual findings in social sciences and humanities, the share of journal articles is rather high. As we shall discuss in chapter 5.2.5, this is related to the presence in the field of two different publications cultures, one oriented towards (English-speaking) journal publications and the other towards book publications in national languages.

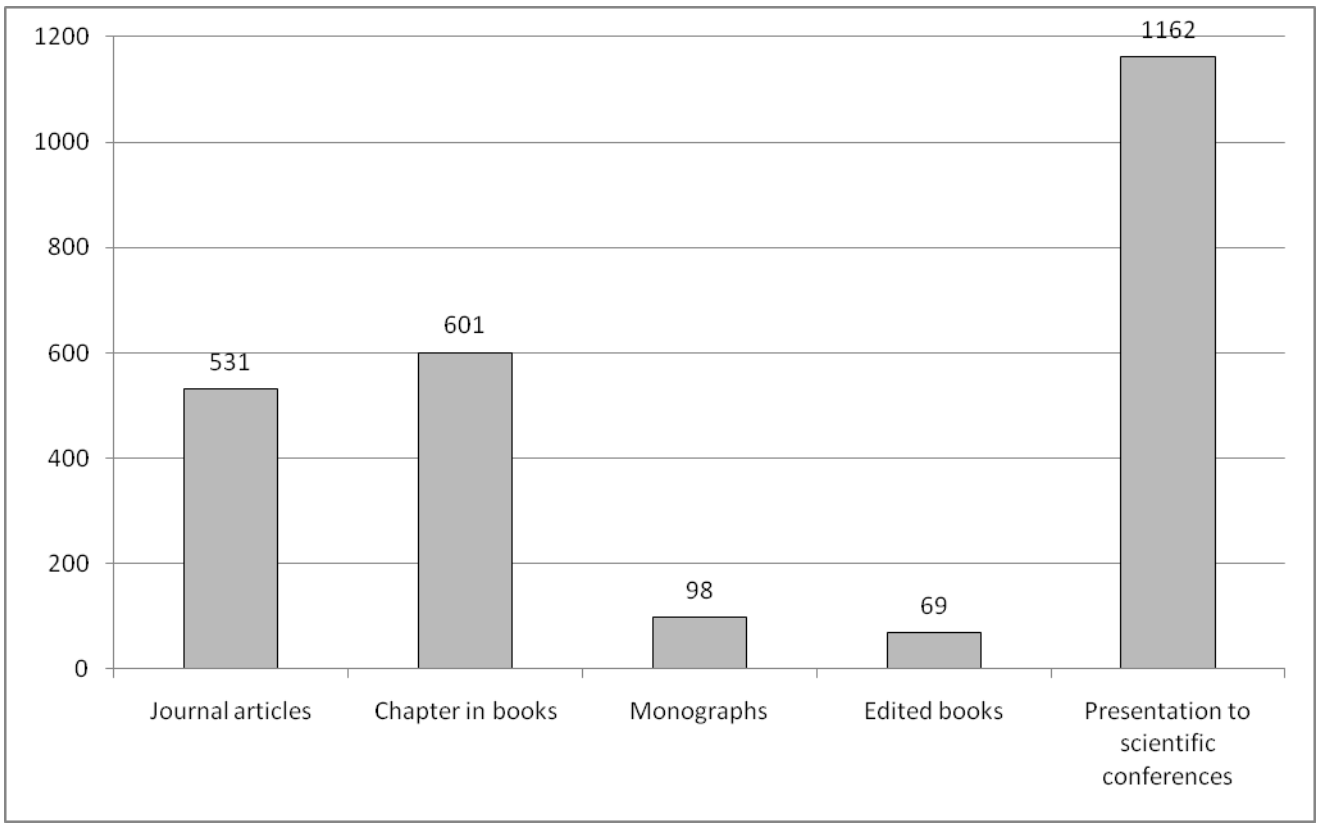


Figure 16: Number of publications/presentations in each category, total sample, 2005-2009

An analysis of the choice of language by type of publication gives an expected pattern (Figure 17): English is by far the most frequently used language for journal publications and scientific conferences, whereas national languages prevail for all types of book publications. As Figure 18 displays, the use of English for conference presentations is not limited to conferences at the international level (excluding neighbouring countries), but also to a large share of conferences in Switzerland and the German-speaking countries.

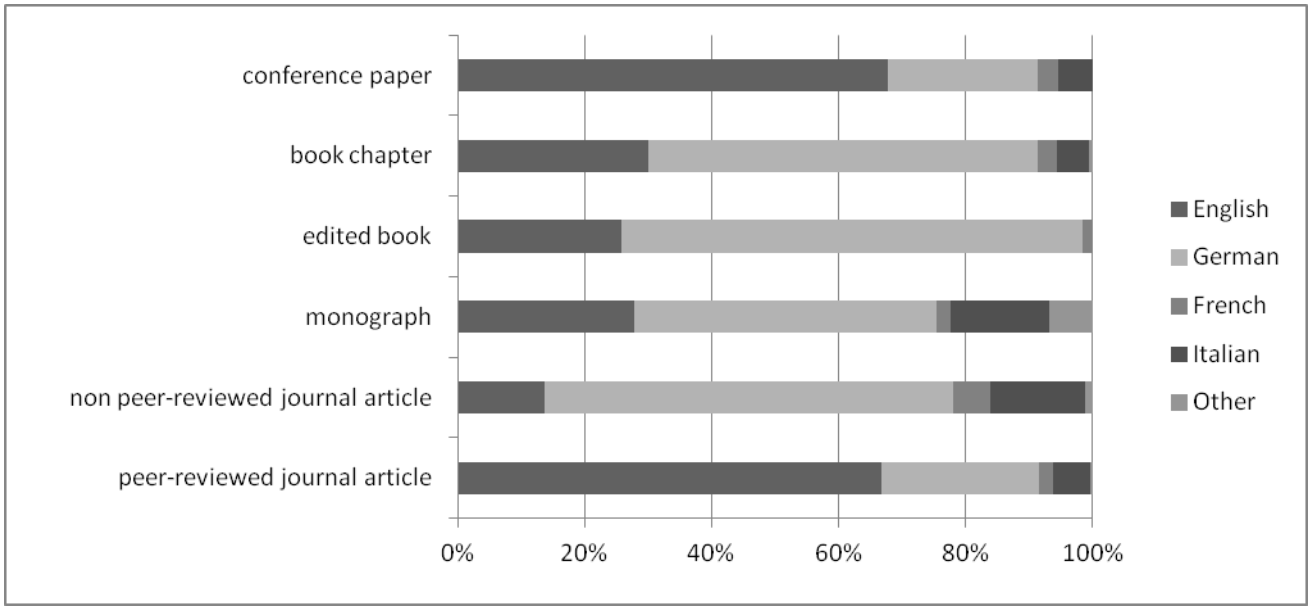


Figure 17: publication type by language, whole sample, 2005-2009

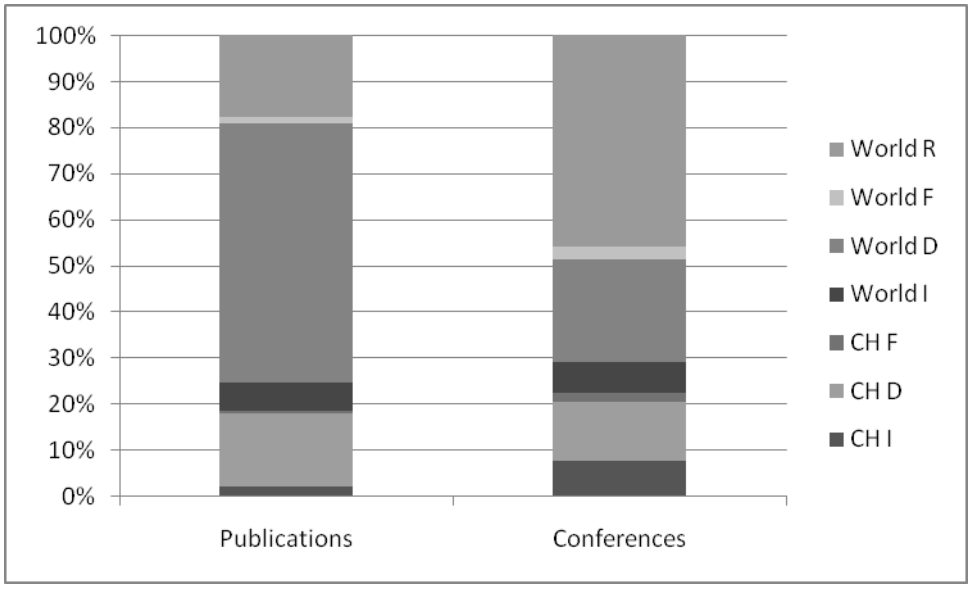


Figure 18: place of publication or conference, whole sample, 2005-2009
publications: information available for monographs, edited books and book chapters

An analysis of publication output per individual displays that, for the period 2005-2009, on average each professor/senior researcher/post-doc produced 4 peer-reviewed journal articles, 6 book chapters, 10 conference presentations and 1 monograph. However, the average values for professors are about double the overall average, indicating a significant difference in productivity between professors and intermediary level personnel. To some extent this could be related to the use of a fairly long time period, which for most post-docs would also cover the period of their doctorate. However, as in other fields, most of the scientific production is generated by the intermediary level and as this should be the phase where individuals construct their scientific career through high-level publications, closer investigation is merited in order to understand the determinants of this low productivity level.

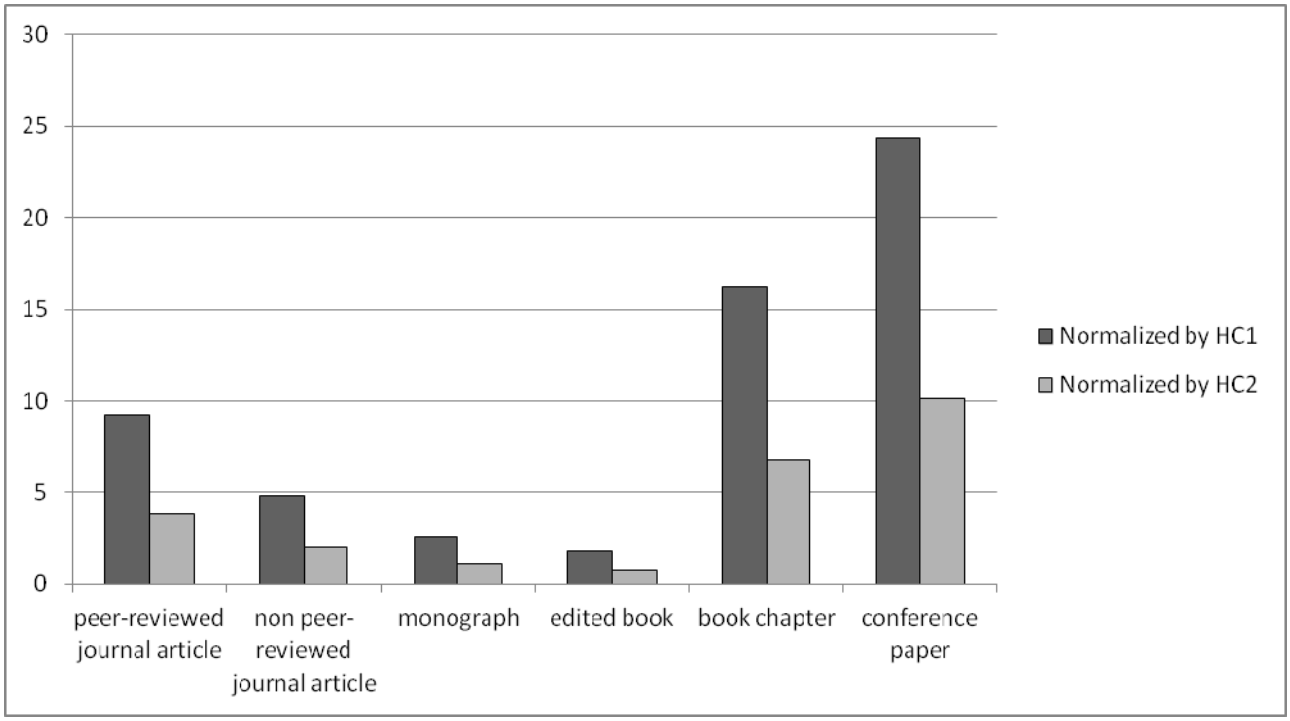


Figure 19: Publications of professors and intermediary level, whole sample, 2005-2009
N of publications per person and category
Normalized by N (headcount) of professors (HC1) and by N (headcount) of professors and intermediary level (HC2)

An analysis of the distribution of publication output by staff gives a result typical of science studies, where a small number of people account for most of the scientific output, while the distribution has a long tail for each group of staff members (Figure 20). More than half of the total publication output of professors and intermediary level staff (a total of 1338 entries[5]) is accounted for by 14 individuals, out of a total group of 74 professors, senior researchers and post-docs with publications (monographs, edited books, book chapters and journal articles). At least in terms of volume, the scientific production of the field is strongly dependent on a small core of highly productive people. The same pattern is also reproduced for scientific conferences.

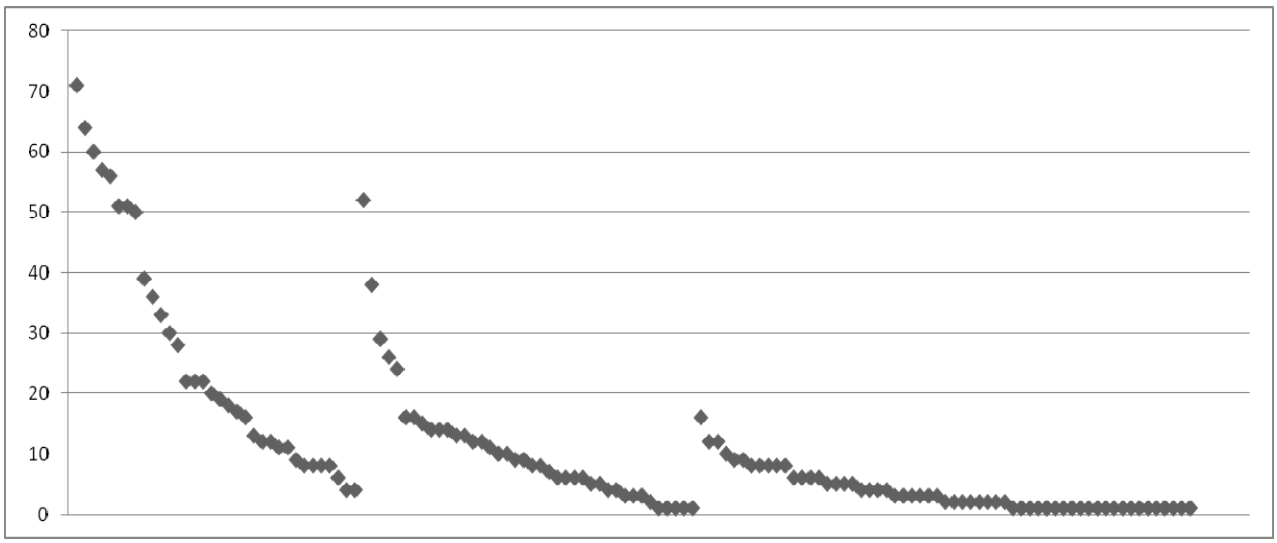


Figure 20: N of publications 2005-2009 by individual
including monographs, edited books, book chapters, peer-reviewed and non peer-reviewed journal articles

[5] Here, each publication is counted once per co-author, thus duplicates are included if a publication is written by more than one person from the sample.

3 groups: professors (left, n=34), intermediary level (middle, n=40) and doctoral students/assistants (right, n=59) Individuals not included (without publications): intermediary level: 9, professors: 1, doctoral students/assistants: 65

However, even though productivity is heavily dependent on a few individuals, it is quite well distributed among the units (Figure 21). There is only one unit with more than one individual who produced over 30 publications in the considered five-year period. In addition, the eight most productive units are spread among universities: 3 of them are in St. Gallen, 3 in Zurich and 2 in Lugano. Of the 14 individuals with more than 30 publications, twelve are professors.

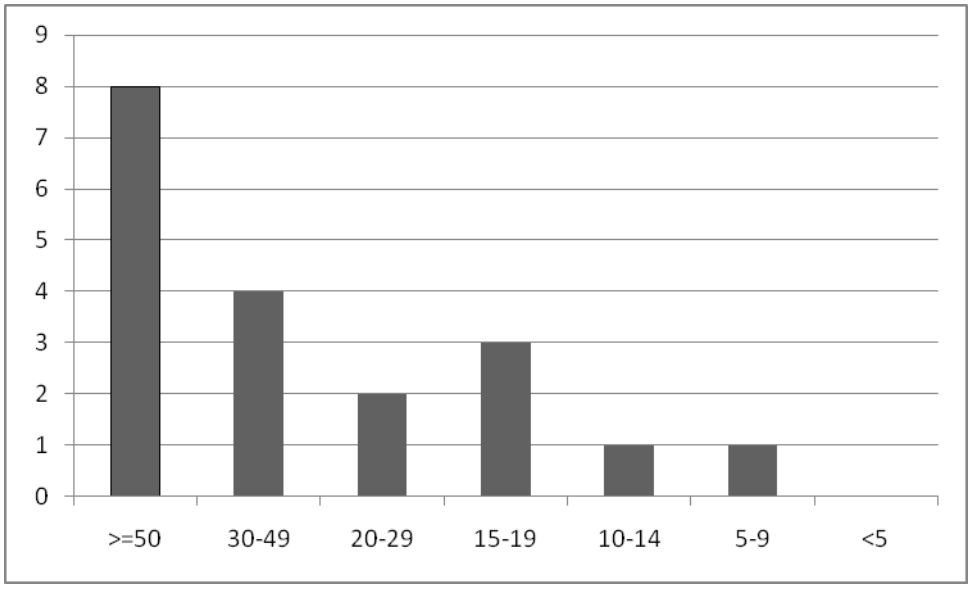


Figure 21: N of publications of most productive unit member
Nr of units in each category

A closer look at journal publications shows that there is a rather wide distribution among journals: 571 journal articles in the database are spread among 330 different journals. Only 76 of these journals account for more than one article in the considered five-year period, and only 17 for at least 5. These 17 journals are displayed in Table 7. Studies in Communication Sciences, edited by SGKM and the University of Lugano, is clearly the journal in which members of the units publish most often, a position further reinforced when adding the 12 papers from Medienwissenschaft Schweiz, the former journal of the SGKM, which merged with Studies in Communication Sciences. Overall, there is a strong prevalence of German journals, suggesting that within the German speaking community there is a certain core of journals which are frequently used.

Journal	Nr of articles
Studies in Communication Sciences	45
Zeitschrift für OrganisationsEntwicklung	15
Medienwissenschaft Schweiz	12
Klartext	10
Publizistik	10
Argumentation	9
Medien & Kommunikationswissenschaft	8
Aviso	7
Capital	7
Communications. The European journal of communication research	6
International Journal of Public Opinion Research	6
Kommunikationsmanager	6
Message	6
Cyberpsychology & Behavior	5
Franco Bernabè Digital Magazine	5
PR-Magazin	5
Semiotica	5

Table 7: Scholarly journals with the highest number of articles, 2005-2009, whole sample

When looking at book publications (monographs, edited books and book chapters), the concentration is slightly higher than for journals: here, the 682 publications are spread across 198 different publishing houses. However, 120 publishers are mentioned only once in the whole database, while 33 account for two publications. Ten publishers published nearly half (338) of all book publications in the sample; these are typically large German publishing houses. Table 8 lists the most frequent publishers in the field.

Publisher	Nr of publications
VS Verlag für Sozialwissenschaften	78
UVK Verlagsgesellschaft	69
Herbert von Halem Verlag	49
Haupt Verlag	39
Springer-Verlag	33
Verlag Reinhard Fischer	18
Gabler Verlag	15
Nomos Verlagsgesellschaft	15
Edizioni Casagrande	12
IGI Global	10
Vistas Verlag	9
Blackwell Publishing	9
Peter Lang AG	8
Fischer Verlag	8
Franco Angeli	8
de Gruyter	6
Edward Elgar Publishing	6
Benjamins	6
Elsevier GmbH	6
Lawrence Erlbaum Associates	6
Chronos	5
Campus	5

Table 8: Publishers with the highest number of book publications, 2005-2009, whole sample

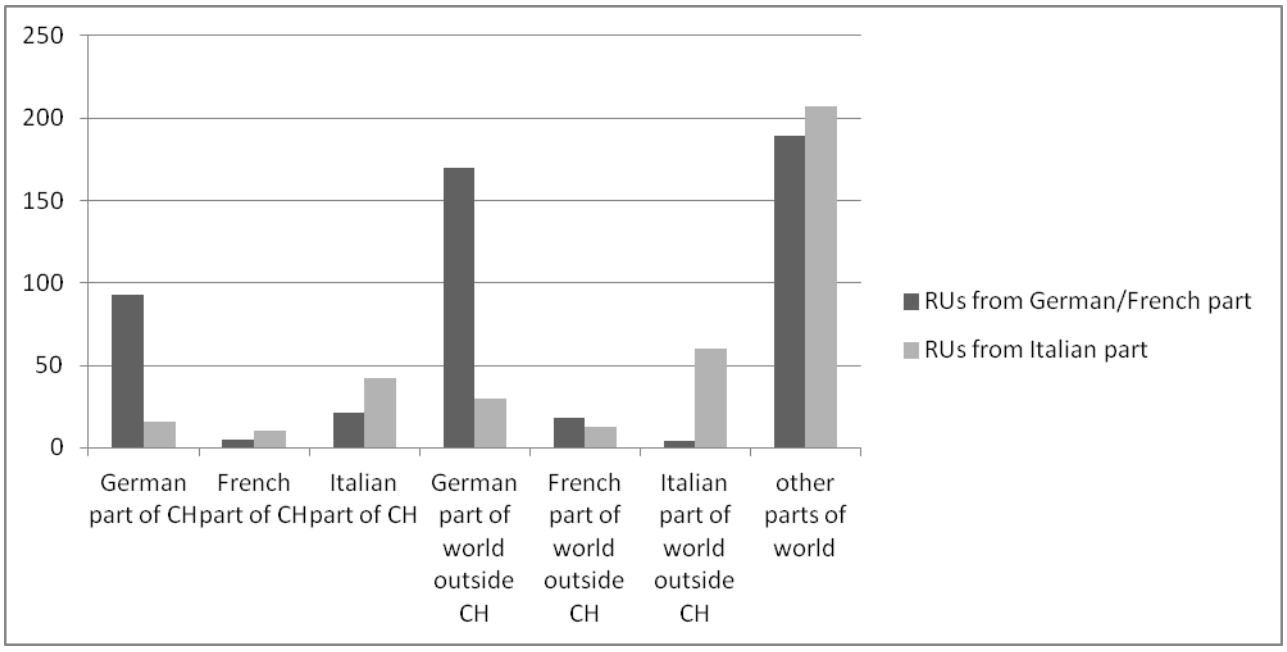


Figure 22: Conference locations, 2005-2009, whole sample
RUs from German and Italian speaking parts of Switzerland

Some geographical orientation towards their own linguistic region is also visible when looking at the conference locations where scholars present their work. As Figure 22 shows, members of units in the German-speaking part of Switzerland tend to present their work more often at conferences in German-speaking areas. Among researchers from the Italian-speaking part of Switzerland, conferences outside the German, French or Italian-speaking areas dominate, although within these areas a preference for the Italian region is noticeable.

4.6.2 Academic awards

Participation in the scientific community goes beyond publication output. Figure 23 gives an overview of the number and different types of academic recognitions received by the members of the research units in the period under consideration.

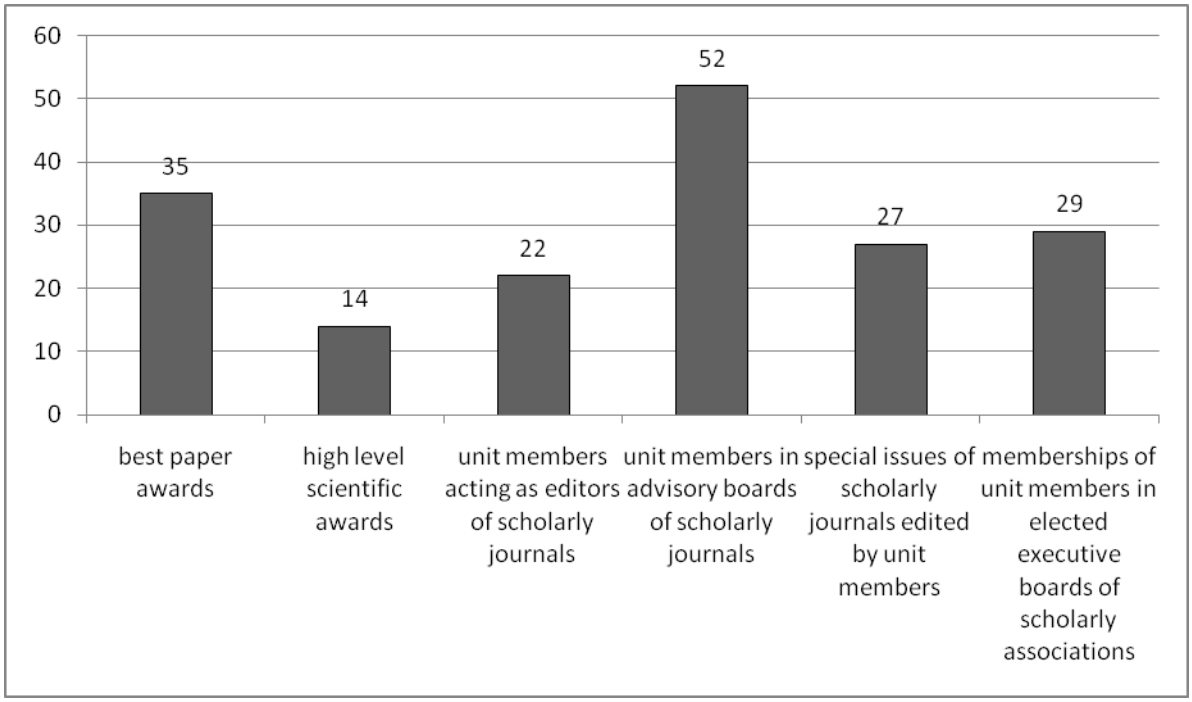


Figure 23: Different types of academic recognition obtained by the RUs, whole sample, 2009
special issues: 2005-2009

4.7 Transfer to public and private

The transfer of research results to society and to the economy is one of the essential dimensions of research activity, and one whose importance has grown strongly in recent years (the so-called "third mission", alongside education and research). At the same time, it is one of the most difficult dimensions to measure by use of quantitative indicators (Gulbrandsen and Slipersaeter, 2007).

In this project, a few indicators have been collected to characterize this dimension, including information on funding from public and non-profit organizations, as well as from private companies, numbers of research reports, presentations, and memberships of commission and boards. A dimension which is specifically relevant to the field of communication sciences has been the measurement of media presence of research in the field.

In the following we summarize briefly a few key results, while we refer to the following chapters of this report for in-depth analysis.

Funding from public and non-profit organizations is the main source of external revenue for the units in the sample, while funding from private companies is very low. In fact, 11 out of 19 units in the sample do not

declare any funding from private companies for 2009. This reflects the prevalent public policy orientation of the field.

Public contracts are very well spread as nine units received less than 50'000 CHF in 2009, while five units exceeded 200'000 CHF (the other five did not declare any public contracts at all). Size appears to matter in this respect, as the recipients of the four largest contracts are also among the five largest units in the sample (measured by FTEs). However, there are also cases of fairly large units whose acquisition of public contracts (and of external funds overall) is much lower than the sample average.

Data on transfer activities measured by membership of boards and commissions, research reports, presentations and media presence are difficult to interpret given the very low numbers and very skewed distributions (in the case of media presence two units account for 50 of the total number of 88 articles identified).

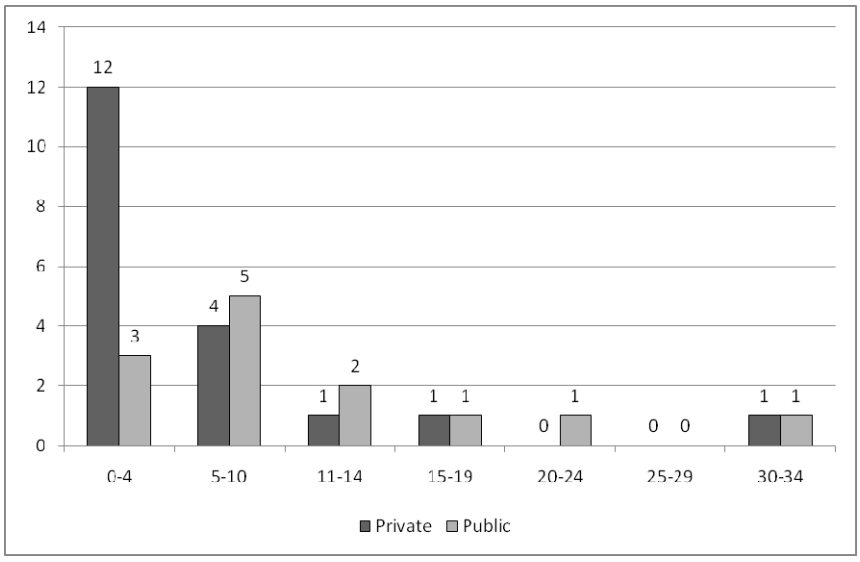


Figure 24. Transfer activities
Sum of items in the following categories (number of units in each class).
Public: membership of commissions and boards, research reports, invited presentations, media presence
Private: membership of commissions and boards, research reports, invited presentations.

However, when adding together the numbers for each category, some meaningful patterns emerge (see Figure 24). Private transfer activities are present in just a few units and, as might be expected, these are the same units which receive funding from private contracts. Public transfer activities are more widespread in the sample, with most units signaling a few activities in these areas.

As an overall comment, transfer activities to the public sector are an important dimension of RU activities in this field, but there are large differences in the degree of engagement of individual RUs. On the contrary, transfer activities towards the private sector are a minor focus and take place in just a handful of units in the whole sample.

4.7.1 Public sector

This dimension includes the transfer towards public and non-profit organizations as well as media presence. As Figure 25 shows, most of the funding obtained for this dimension stems from public institutions, predominantly from national Swiss organizations. The most important of these national entities is the Federal Office of Communications BAKOM, which accounts for nearly half a million of the funding in 2009, followed by the State Secretariat for Education and Research, SRG-SSR, and the Commission for Technology and Innovation, each of them providing nearly 250'000 CHF of project funding in 2009.

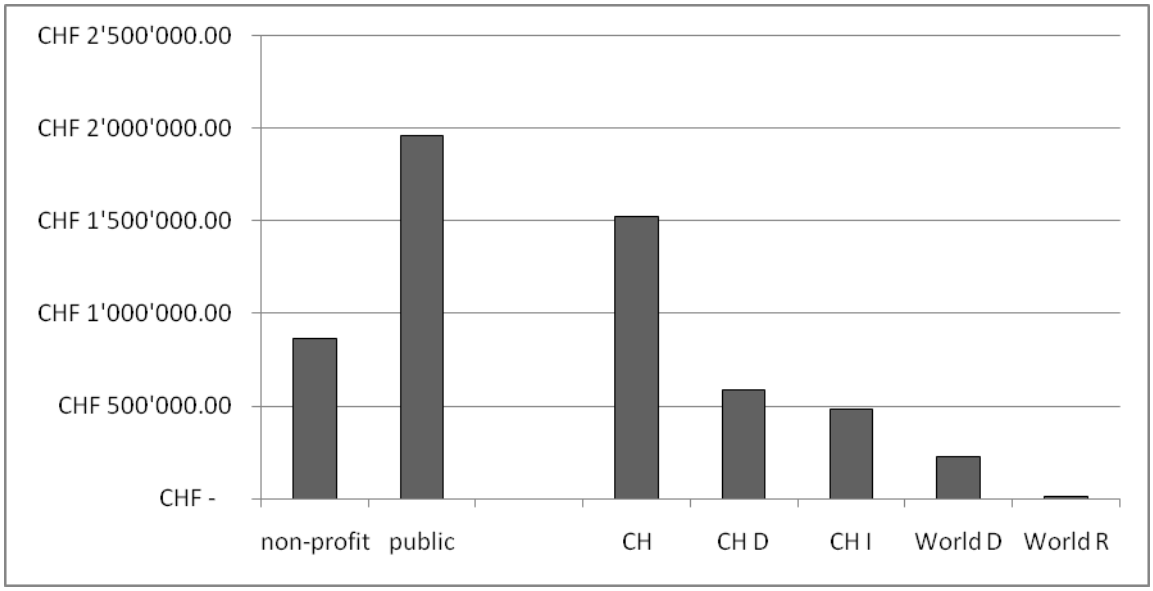


Figure 25: Provenience of public funding, whole sample, 2009
CH= national organizations from Switzerland

Probably as a consequence of this funding from public organizations, on average each RU produced just under two reports per year for public organizations during 2005-2009, and held five presentations during 2009 (Figure 26).

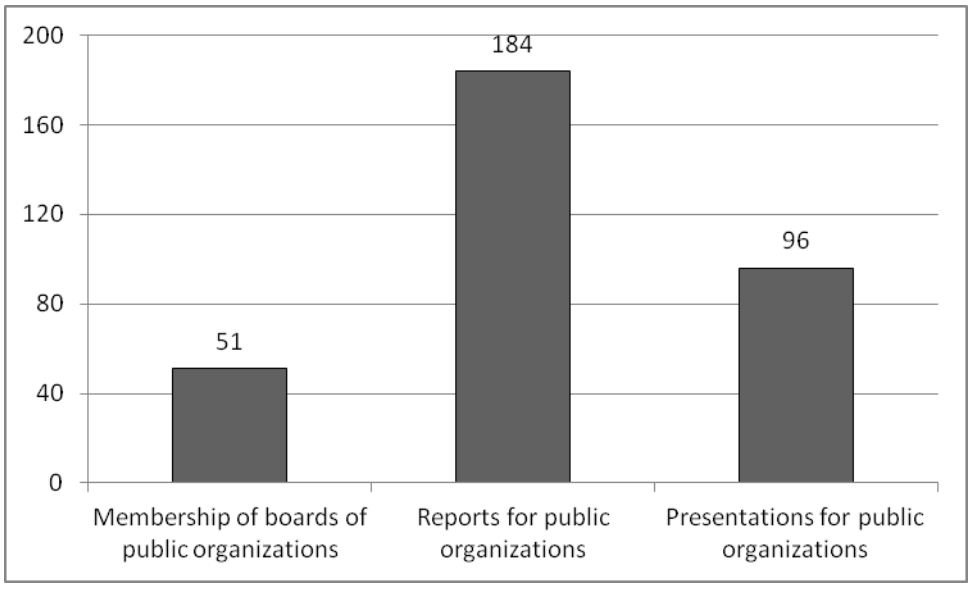


Figure 26: Activities for the public sector, whole sample, 2009 (boards and presentations), 2005-2009 (reports)

On average, each unit had a presence in 4.6 newspaper articles during 2009 – as measured through the databases *Factiva* and *LexisNexis.* Media presence is dominated by a few units (Figure 27): 50 out of the 88 newspaper articles citing a unit or member of a unit during 2009 refer to just two units – one in Lugano and one in St. Gallen, while five units are never cited, and six only once.

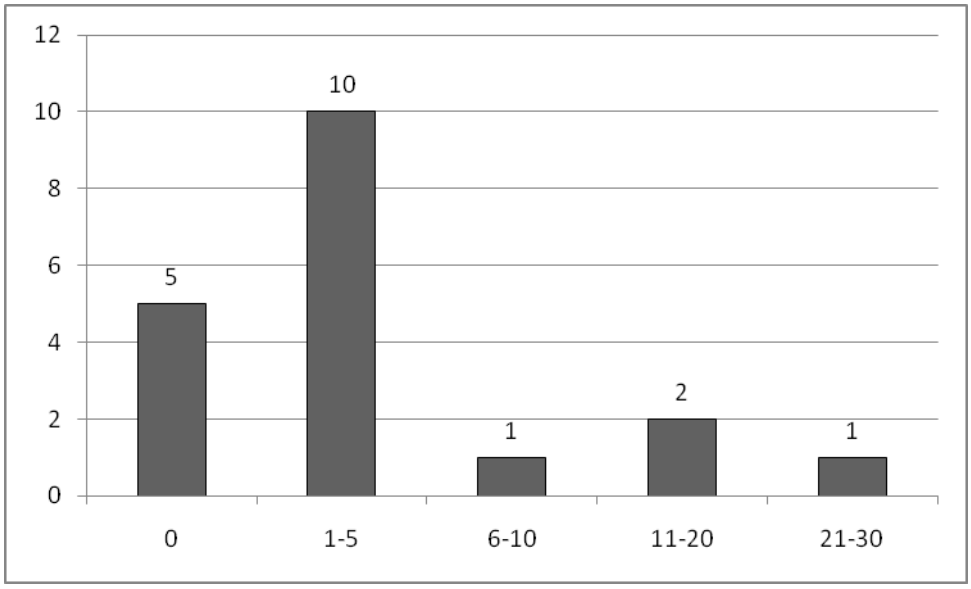


Figure 27: Media presence, N of articles 2009 (N of RUs in each category)

4.7.2 Private sector

Funding from the private sector is much lower than from the public sector. Here, most of the funds are provided by organizations from Germany or the German speaking part of Switzerland (Figure 28).

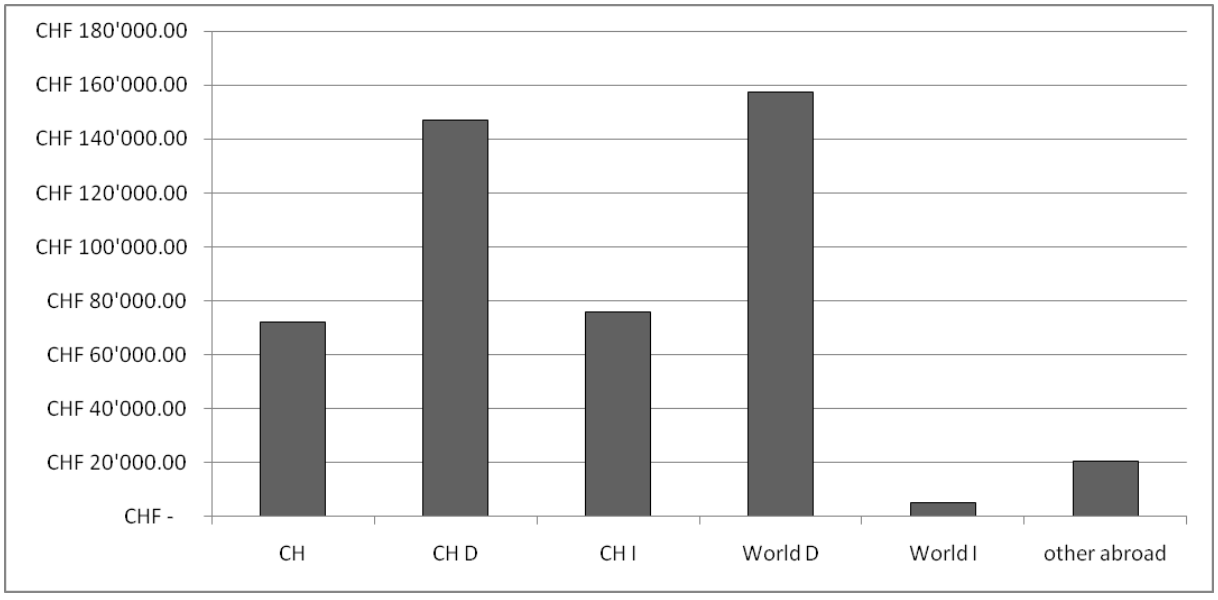


Figure 28: Provenience of private funding, whole sample, 2009
CH= national organizations from Switzerland

On average, each unit produced 0.56 reports per year for private organizations during the period 2005-2009, and held 2.68 presentations during 2009. Compared to activities for public and non-profit institutions, the proportion of presentations vs. reports is much higher for private organizations.

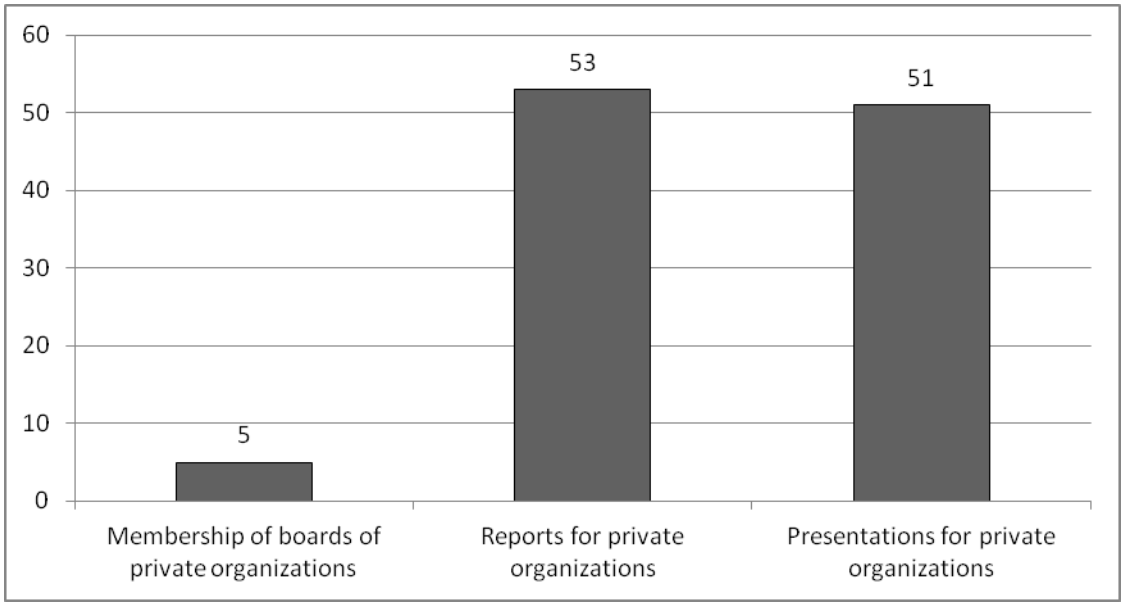


Figure 29: Activities for the private sector, whole sample, 2009 (boards and presentations), 2005-2009 (reports)

Further education – another element that can be considered a part of transfer activities – is rather low among the units in the sample (see chapter 4.4). This is probably due to the fact that further education offers are usually available at a higher organizational level than RUs.

4.8 A focus on intermediary staff

Intermediary level staff – a general term we use to designate all staff above the doctoral level, but not occupying a professorial position - represent a central component of RU human resources. This level is not only the most productive in terms of scientific publications in many disciplines, it is also critical for the preparation of future professors and thus determines to a large extent the profile of the discipline. Moreover, unlike professors, whose appointment process depends on university decisions and whose positions are mostly long-term, intermediary staff can be hired flexibly on the academic job market, thus offering RUs the opportunity to strengthen their capabilities as soon as financial resources are available.

In terms of composition, our dataset contains 61 people in the categories of post-doc, senior researcher and lecturer. Of the intermediary staff, 49 have at least half of their academic employment at one of the RUs considered in the sample. The following analysis is based on these 49 individuals. Their distribution among RUs is highly skewed: five RUs have no intermediary staff, whereas four RUs have five or more people in this category and thus make up half the total in the whole sample. As Figure 30 shows, in most RUs intermediary staff account for less than 1/3 of total FTEs and most RUs have less intermediary staff then professorial, but there is one specific RU where most of the staff is in fact at the intermediary level.

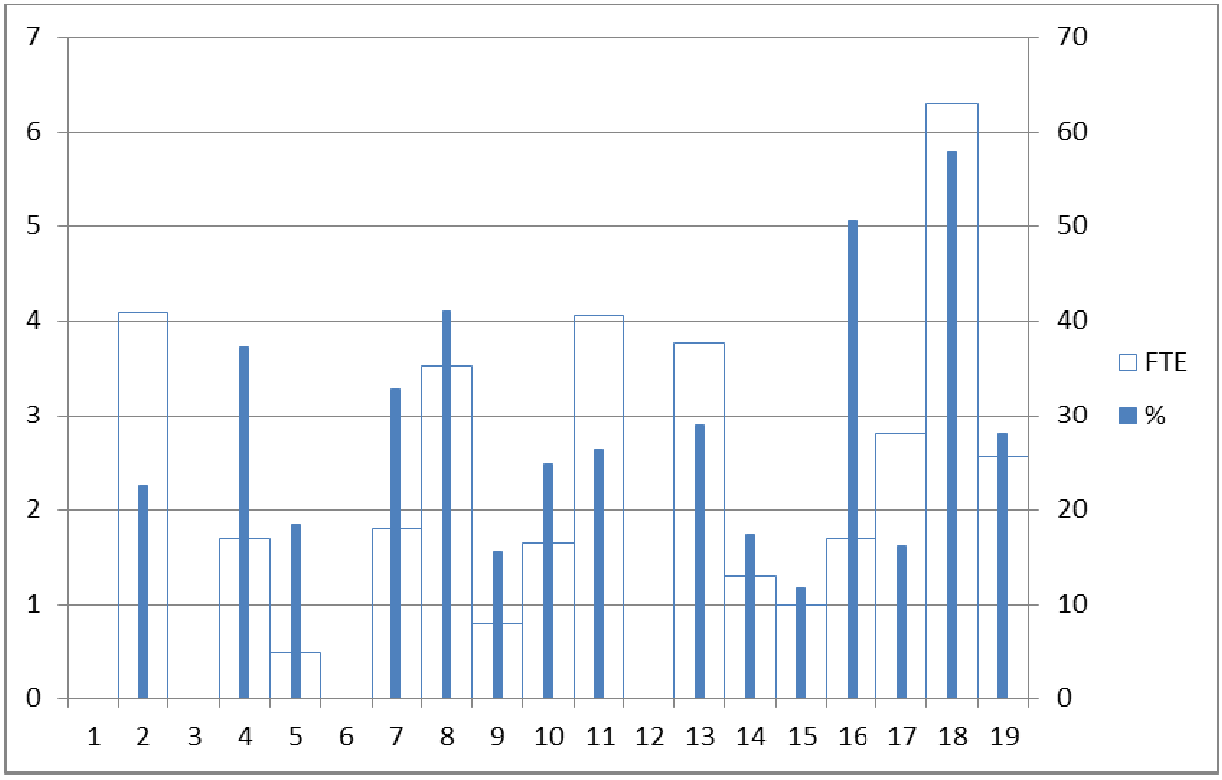


Figure 30. Intermediary staff of RUs
FTEs intermediary staff and % of total FTEs.

4.8.1 Background and hiring procedures

Figure 31 compares the year of doctorate completion with the year in which the individuals started their activity at the considered RU. It also indicates whether the doctorate was obtained at the university where the RU is located.

22 individuals did their PhD at the same university (mostly at the same RU) where they are now employed, while 24 did theirs elsewhere, two do not hold a PhD (employed at a university of applied sciences), and for one this information is not available. The basic pattern visible in the figure (those with the PhD from the same university being concentrated in the upper left) is due to the nature of the data: as the starting date at the RU does not refer to the current position, but to the general starting date, there are no intermediary people with a doctorate from the same university who started at the RU after 2006, and most people with a doctorate from the same university started their activity at the RU before the date of their doctorate (Figure 31).

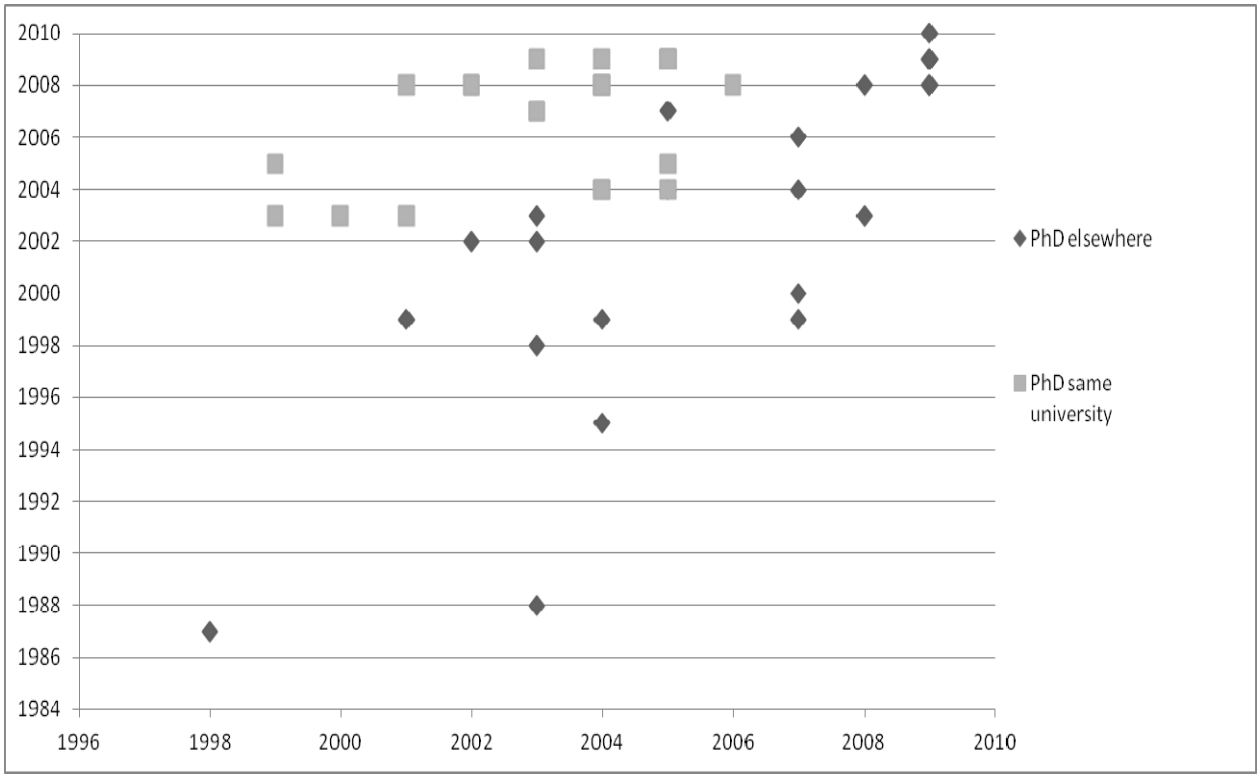


Figure 31: Starting year at RU, year and place of doctorate
x-axis: year of start of activity at current RU
y-axis: year of doctorate completion

There is only one individual who concluded their doctorate from the same university more than six years before the survey and was still employed in an intermediary position at this place (and even this person left during the year 2009). This leads to the conclusion that there are two options for a post-doc who stays at the place of his/her doctorate: either they are promoted to professorship, or they leave. On the other hand, there are a few people at the intermediary level whose doctorate dates from rather a long time ago – in all likelihood they are not pursuing an academic career, but employed as lecturers.

Indeed, if we compare the eight people with a doctorate from before 2000 to the rest of the sample, we can see clearly that they are more active in teaching (48% of their time, vs. 21% in research), while those with a doctorate from 2000 onward are doing more research (42% of their time, vs. 21% in teaching). When comparing people with a doctorate from the same university to those from outside, there is no such difference.

If, for those with a doctorate from the same university, we take the year of the doctorate as the year of post-doctoral employment, we can look at employment strategies of RUs. Overall, during recent years the RUs employed a similar number of post-docs with internal and external doctorates, and there is no visible tendency to favour either internals or externals(Figure 32).

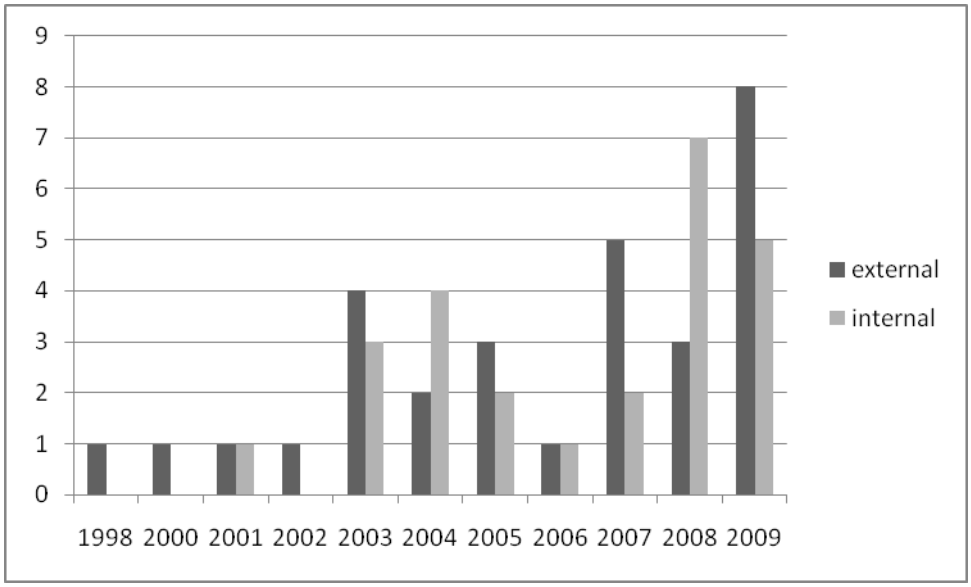


Figure 32: Year of employment of post-docs
external: post-doc with a doctorate from another university
internal: post-doc with a doctorate from the same university; year of doctorate considered as year of employment

Most of the RUs in the sample hire intermediary staff both from outside and from their own PhD students; while some differences between individual RUs emerge, these are hardly significant given the very small sample considered.

4.8.2 Productivity

The phase after a doctorate is crucial for an academic career; establishing visibility within the scientific community is an important element. This happens most strongly through publications; usually, the post-doctoral phase is an important period in a scholar's productivity cycle (Goodwin and Sauer, 1995).

A comparison of the productivity of individuals at the intermediary level with professors and doctoral students in our sample – by looking at their written publications over the considered five-year period (Figure 20) – confirms what might be expected: with an average of 9.02 publications per individual over five years (including those without publications), they are generally much more productive than doctoral students (1.81, including doctoral students in the earliest phases of their doctorate), but overall far less productive than professors (25.6). However, this might also reflect the early stage of their career, a 5-year period being rather long in this respect, as probably not all intermediary staff has already been actively writing publications in 2005. Indeed, the difference gets lower when looking only at the year 2009: in this year, the intermediary level produced on average 2.14 publications per individual, while professors published on average 5.17 items.

As shown in chapter 4.6.1 (Figure 20), among the nine individuals with 50 or more publications, there is only one from the intermediary level, whereas it accounts for nearly half of those having between 24 and 49 publications (four out of nine).

If we relate publication output in the most recent years (2008-2009) to the year of the doctorate a clear pattern emerges (see Figure 33).

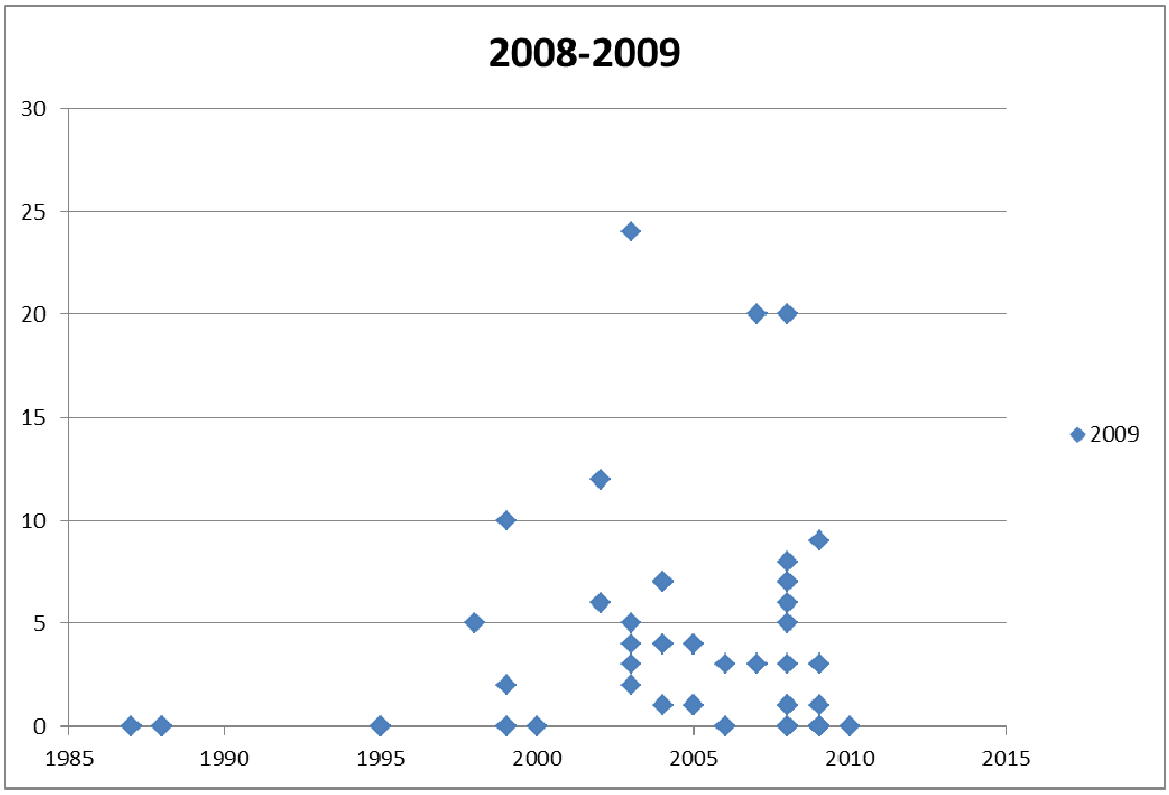


Figure 33. N of publications in 2008-2009
X: year of the doctorate, Y: number of publications (sum of 2008 and 2009)

Predictably, the individuals who received their doctorate in the year of observation (2009) display a low level of scientific production, as they were PhD students for most of the period considered. The cohorts of 2007 and 2008 already display a large spread; just 1-2 years after the doctorate differences in the level of production are large and the highly-productive people stand out. However, the level of scientific production of individuals who completed their doctorate before the year 2000 is very low, confirming the hypothesis that there is a specific group of lecturers with a strong orientation towards teaching and limited research activity.

A more fine-grained analysis of the data shows that the most productive intermediary staff already have a few publications before the end of their doctorate and start their publication activity quite rapidly after getting the PhD. Moreover, unlike other members of the intermediary body, their publication output increases fairly continuously in the following years. These observations suggest that following the evolution of publication output across different years is very important in identifying at an early stage those post-docs who have the potential for a future academic career.

When looking individually at the five intermediary level persons with the highest productivity, it becomes clear that this also indicates the purpose of pursuing an academic career. Two of them did their PhDs (in 2002 and 2003) at different universities to where they were employed during data gathering. They have subsequently (by summer 2011) moved on again; one of them became scientific coordinator of a unit at another university in the same country, while the other one is now a professor at a university in the country where he did his PhD. In these two cases, the post-doc period at the unit of interest seems to have been an important stage in their career. Two of the other highly productive individuals, who both concluded their PhDs in 2008, are now assistant professors at the same unit where they did their PhD and where they were employed during our study – they are also both at the same unit. The other one did his PhD (2007) at the same unit where he was employed during the study, became an assistant professor at this unit and has left now (summer 2011) for a position of full professor at a university abroad.

In contrast, the less productive individuals tend to stay in their positions: among those individuals with a PhD from the unit where they are currently employed, seven concluded their PhD in 2005 or earlier. Of

them, six are still at the same unit as post-docs or lecturers, while one has become research coordinator at a university of applied sciences.

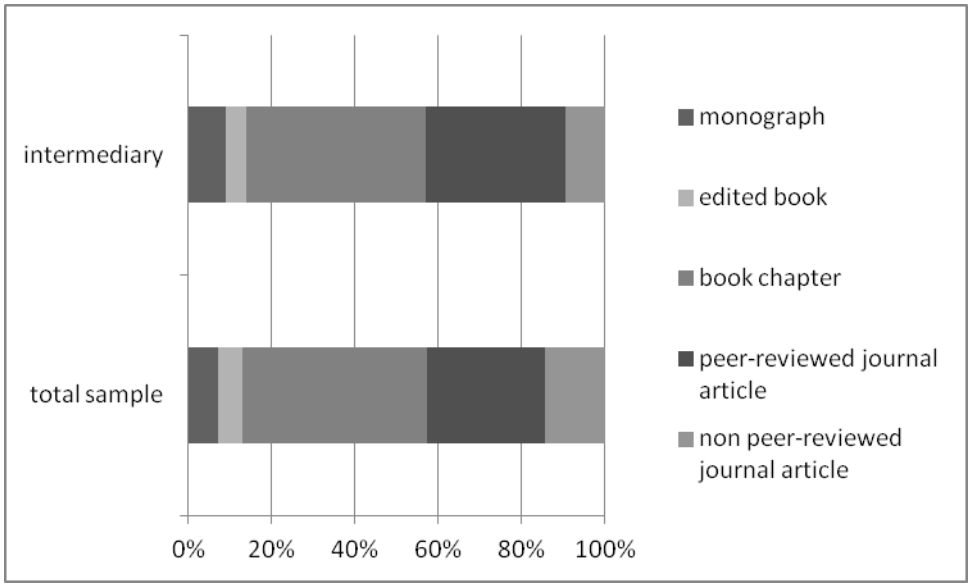


Figure 34: Composition of publication output of intermediary people, 2005-2009

The most important type of publication in the whole sample is book chapters, followed by peer reviewed journal articles (Figure 34). The main distinction between intermediary staff and the whole sample is a higher share of peer-reviewed journal articles among all journal articles, and a higher ratio of monographs to edited books. Both facts can be explained by the career stage: peer-reviewed journal articles are probably the strongest currency on the publication market for a young scholar wishing to further his or her career, while in the field of communication sciences in Switzerland, many doctoral theses become monographs, while editing a book is something typically done by more senior researchers. However, the differences here are rather small.

In summarizing, these results show that, while intermediary staff represent an important component of the RU workforce, the majority of these people do not envisage – or do not have the necessary capabilities for – an academic career, but instead work to support professors in tasks like managing external contracts or teaching courses. These individuals stay in the RU for a maximum of 5-6 years – complying with most university regulations on the duration of post-doc employment.

Two groups, however, have specific characteristics: a small group of highly productive people – with a scientific output similar or larger to many professors in the field – and a larger group of lecturers who completed their doctorate before the year 2000 and are essentially devoted to teaching.

5 Swiss communication sciences: the diversity of actors (RUs) and profiles

While the results presented in chapter 4 provide an interesting overview of the whole field, the main purpose of this project was to collect data at the level of individual research units and to compare their characteristics and individual profiles. Accordingly, the questions which we analyze in this chapter concern to what extent RUs in the field display different orientations in terms of their patterns of activity and products, and whether these differences can be explained by structural characteristics or by explicit strategic choices of the units.

Therefore, in the following we present different types of indicators disaggregated at the level of individual RU; as agreed with the project accompanying group, the names of the units are anonymized, and in order to avoid easy identification, we don't use the same numbering of RUs throughout the whole chapter.

We begin with a quick characterization of the heterogeneity of the sample, by looking at size, type of HEIs, language and scientific subfield. We then provide an in-depth analysis of individual indicators, by showing for which dimensions we observe the largest differences between individual RUs. The last part of the chapter is devoted to the analysis of RU profiles using the methodology explained in chapter 3.5, which provides a synthetic overview of the different orientations of the RUs in the sample. We conclude with a final discussion of diversity in the field.

5.1 The sample: organizational and institutional heterogeneity

As introduced in chapter 2.3, we assume that a large part of the observed differences among RUs is related to institutional and environmental factors; a preliminary analysis of these underlying differences is thus required. Among the many possible environmental factors we focus on the following four, which emerge from our previous work as central to RU activities:

a) *The unit's size, as measured by the total number of FTEs*. The number of FTEs in the considered units varies between 2.7 and 18.19, with quite a graduated spread. For the purposes of the following analysis we distinguish between three categories of RU, namely small (less than 4 FTEs), medium (between 4 and 8 FTEs) and large (more than 8 FTEs).

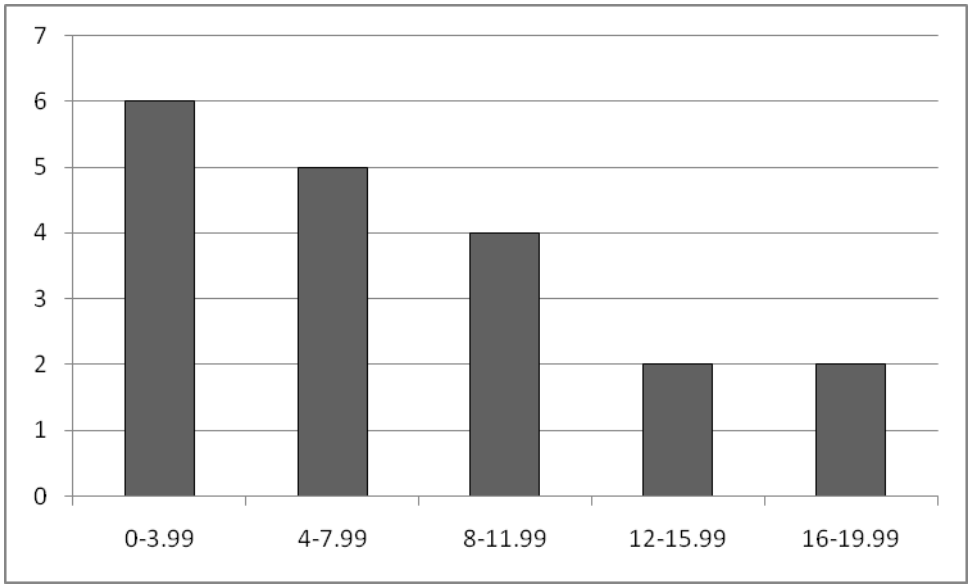


Figure 35. Distribution of RUs by size (FTEs)
N of RUs in each category

b) *The type of HEI the RU belongs to*; the sample includes 18 university-based RUs, as well as a single UAS-based RU. Accordingly, we will not make the distinction in most cases, but when it is interesting to do so we will single out the UAS-based RU.

c) *The linguistic region*, distinguishing between RUs in the German-speaking, Italian-speaking and French-speaking regions of the country. The sample includes 11 German-speaking units, 7 Italian-speaking units and only one French-speaking unit.

d) *The main scientific subdomain*, as it is well known that communication sciences in the European context include quite different subdomains, with different traditions, publication media etc. A fine-grained classification of RUs by subdomain would require, firstly, a clear identification of the domains to be considered, and secondly, precise data on contents, publication media etc. For the purposes of the following analysis we limit ourselves to classifying the units according to the two main directions recognized in the international literature, namely interpersonal communication on one side, and mass-media and political communication on the other, by using the self-declarations of the heads of units on their fields of activity.

By this approach, the classification of most units is fairly straightforward (see the box below for details): 7 units are classified under interpersonal communication, 10 units under media and political communication while two units cannot be attributed to either direction. A more fine-grained classification is provided in the next section.

As Table 9 below shows, the division between media and political communication on one side and interpersonal communication on the other follows a geographical division between German-speaking and Italian-speaking universities.

	Media	Mixed	Interpersonal
German	8	2	1
Italian	1	0	6
French	1	0	0

Table 9. Structural characteristics of RUs

It is important to underline that the aim of this classification was not to try to identify thematic groupings of RUs, but rather to build an analytical basis in order to investigate to what extent these groups of units also differ systematically concerning their profiles of activity.

METHODOLOGICAL NOTE

The grouping by domain is based on the self-declaration of fields of activity in the interviews with the unit heads. The fields have been divided between media and political communication on one side, and interpersonal communication on the other; some fields have not been used as they are too generic (sociology of communication, methods) or transversal to this classification (technologies). An average score for each of the two main areas has been computed and units classified in this way.

5.1.1 Research topics: diversity and main foci

It is worth providing a more in-depth analysis of the distribution of research topics by RU, using the data from the interviews with the heads of units. In the interview, they were given a list of research topics and

asked to indicate if they are central research topics for their RU, a topic of secondary importance or a topic which is not covered at all.

Figure 36 displays the results aggregated by research topic, showing a picture of clear specialization where relatively few units are only active in a single field (the average number of central topics per unit being 3.5), with the only true cross-field topic being new technologies and computer-mediated communication. Beyond the simple division between mass and interpersonal communication, Swiss communication sciences display a highly differentiated thematic structure, where there are few units working on the same topic. While this form of organization can produce a high level of diversity and satisfy different user's needs, it is questionable to what extent it allows for sufficient competition and critical mass, unless the field is very open internationally.

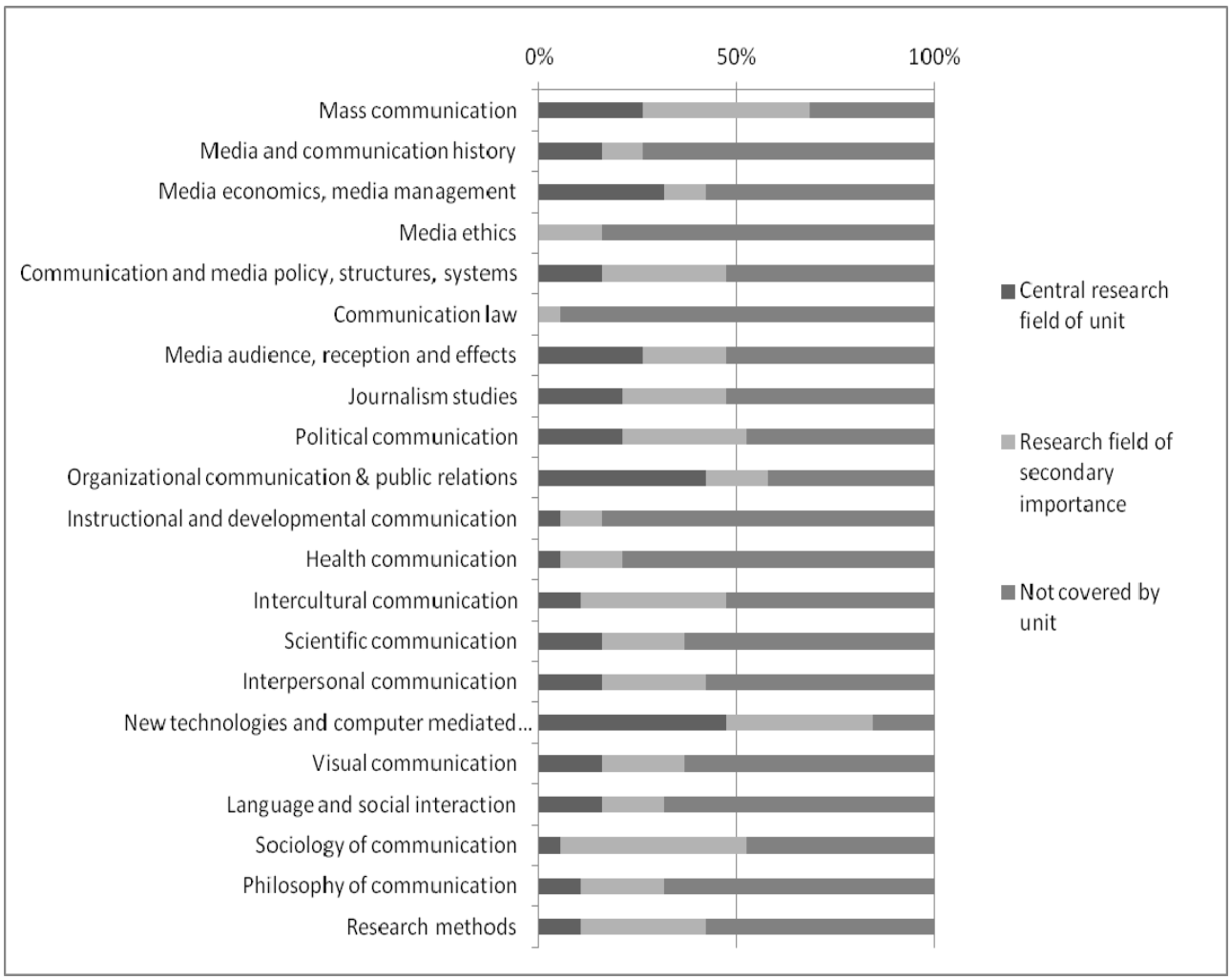


Figure 36. Importance of topics in RUs in the field
N of units which declared the field as central/of secondary importance/not covered

An analysis by research unit confirms this pattern of specialization: on average, RU heads indicated 3.5 topics as central to their research activities and for 15 out of 19 units this number was between 2 and 4; only a single unit indicating 8 priority themes can be characterized as rather unfocused.

A more fine-grained analysis of the declared topics allows us to divide the RUs into three main groups, which display quite distinct profiles (see Figure 37):

- A first group is composed of 6 research units, with a focus on mass and political communication.
- A second group of 4 units is distinguished by a focus on economics and new technologies, even if it does show some overlap with the preceding group.

- A third group is composed of 4 units, with a focus on interpersonal communication and new technologies, including health communication, visual communication, etc.

The other five groups have a largely specific profile, for example focusing on a specific discipline applied to communication (linguistics or psychology) or a specific topic (intercultural communication).

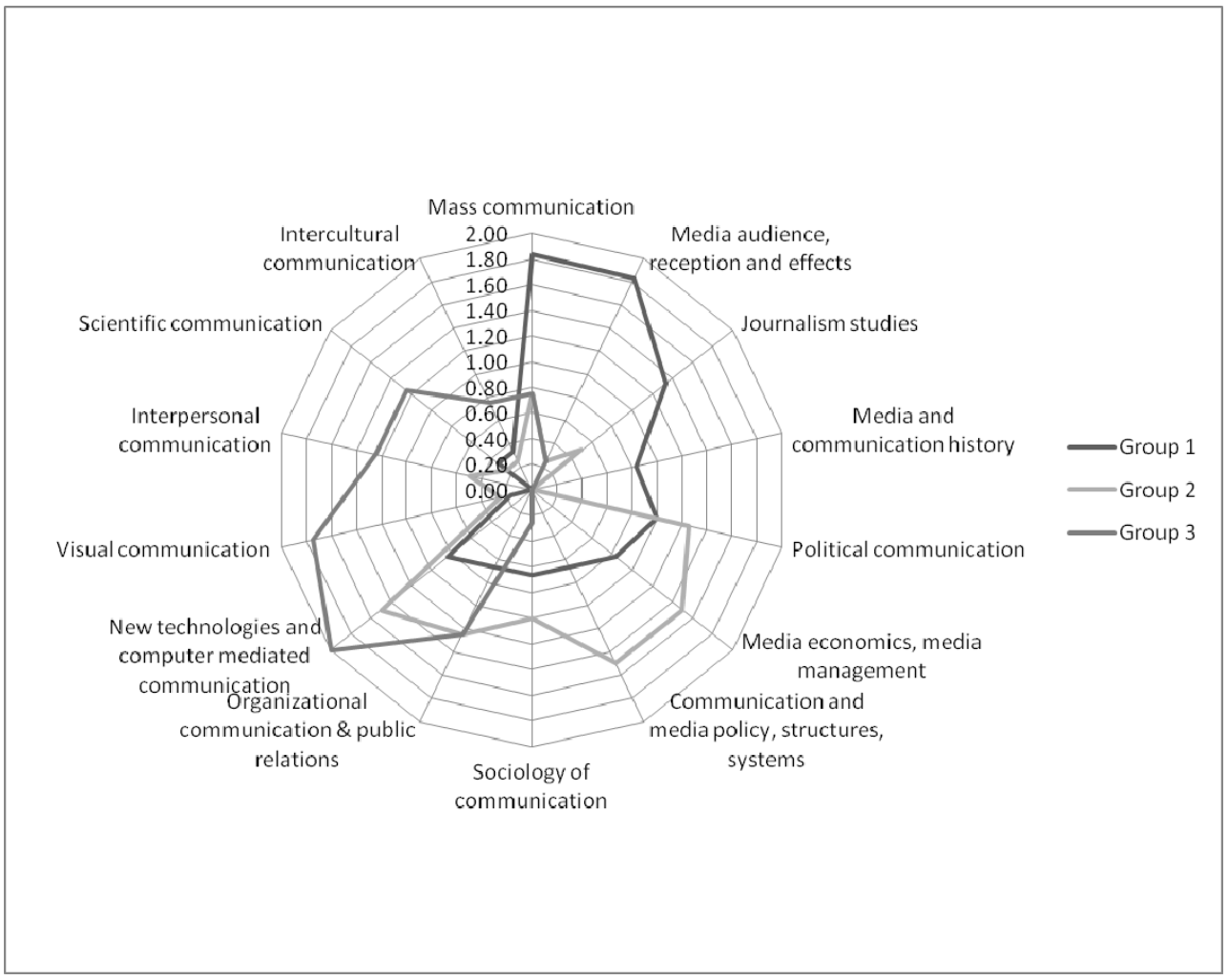


Figure 37. Profiles of the three main groups of RUs by topic
N = 6 (group 1); N = 5 (group 2); N = 4 (group 3). The remaining 4 units are not displayed as they cannot be grouped in a meaningful way.

Finally, heads of units were asked to indicate whether they expect each research topic to become more or less important for their RU over the next 3-5 years. The data display a striking consistency of expectation as very few units mentioned an expected change. As Figure 38 displays, the topics of increasing importance are concentrated in interpersonal communication (including organizational communication) and technology; this could suggest some strengthening of this area in Swiss communication sciences in relation to the traditional media and political sciences domain.

These results would support the hypothesis that changes in the orientation of the field take place mostly through the creation of new units and changes in the heads of existing ones rather than through internal reorientation.

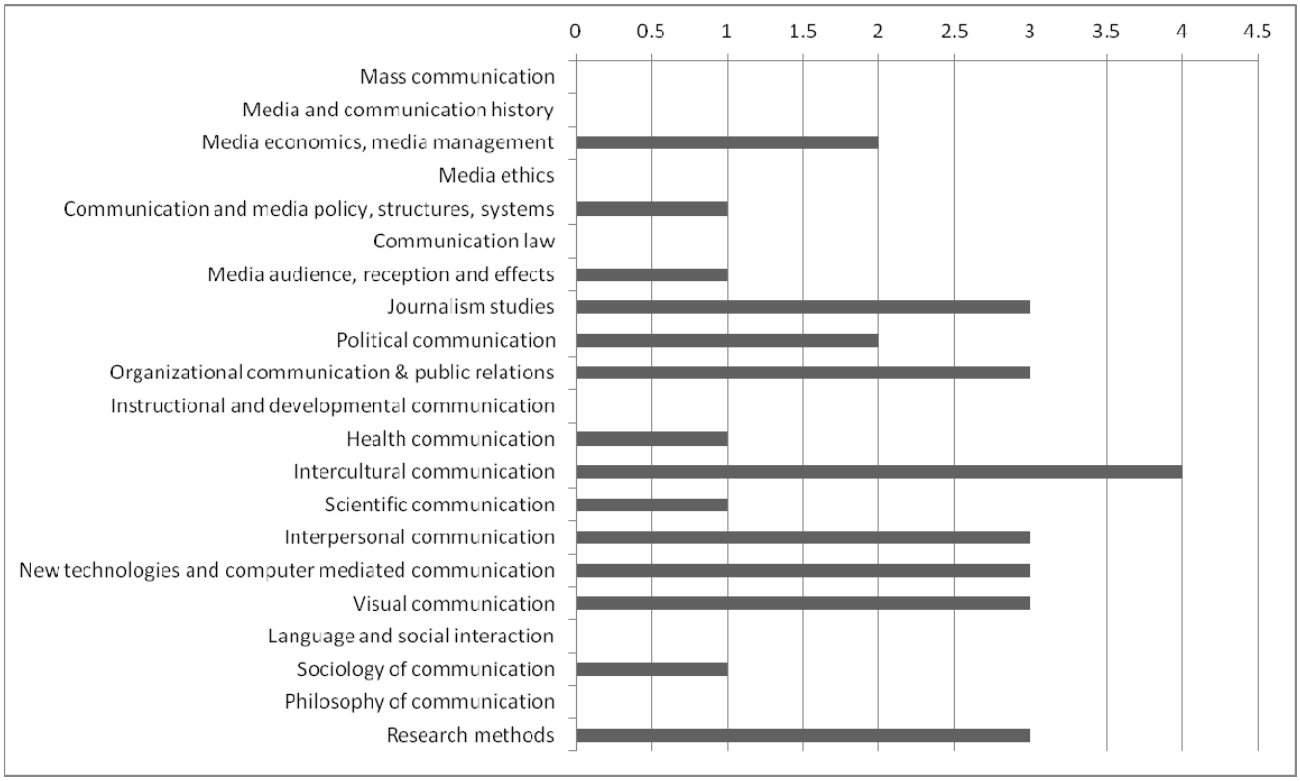


Figure 38. Changes in research topic in the future
N of units which declared that the field will become more important (N=19)

5.2 Sample diversity: a summary analysis

In order to interpret correctly the profiles of individual RUs, it is important to provide a brief overview of the main characteristics of the sample of 19 RUs considered. Accordingly, Table 10 provides some descriptive statistics including the average and median of the sample.

Dimension	Indicator	Total	Average	Median	STDEV	Max	Min
Staff	Professors (FTE)	27.71	1.32	1.00	0.94	4.33	0.25
	Total staff (FTE)	132.85	6.33	5.48	4.04	18.19	1.05
Research trair	Number of PhD theses	83.00	3.95	4	2.75	9	0
	Number of internal and external PhD students	163.00	7.76	8	3.75	15.00	2
Bachelor	Number of theses Bachelor	339	16	8	24.11	92	0
	Number of hours taught Bachelor	4500	214	164	251.15	1036	0
	Number of hours organized Bachelor	6258	298	148	398.18	1540	0
Master	Number of theses Master	256	12	10	13.53	47	0
	Number of hours taught Master	4693	223	154	238.16	930	0
	Number of hours organized Master	8154	388	196	476.73	1456	0
Further educa	Number of theses Further Education	18	1	0	2.33	10	0
	Number of hours taught Further Education	299	14	0	23.42	89	0
	Number of hours organized Further Education	1477	70	0	188.25	783	0
Science	Funds for research obtained from SNF or other public research funding agencies	2'358'534	112'311	59'462	119'796	318'526	0
	Total number of publications (journal papers, book chapters, monographs, edited books)	1270.00	60.48	59	35.70	133.00	5
	Total number of conference presentations	1212	58	40	55.54	186	1
Public	Funds for research obtained from public and non-profit organizations	2'793'532	133'025	59'259	187'996	679'830	0
	Number of memberships of commissions or boards of public and non-profit organizations	42.00	2.00	1	2.37	9	0
	Research reports for funding agencies, public and non-profit organizations	154.00	7.33	4	8.98	31	0
	Invited presentations for public or non-profit organizations	79.00	3.76	1	4.94	18	0
	Number of media articles written by or in which RU (or a member) is mentioned	87.00	4.14	1	7.81	30	0
Private	Funds for research obtained from private organizations	477'485	22'737	0	44'040	146'842	0
	Number of memberships of commissions or boards of private organizations	4.00	0.19	0	0.51	2	0
	Research reports for private organizations	32.00	1.52	0	3.50	16	0
	Invited presentations for private organizations	40.00	1.90	1	2.07	6	0

Table 10. Summary statistics on individual research units

The table displays that a typical RU in the sample – as represented by the median - is active in science and research training, as shown by the relatively high numbers of PhD students and publications, as well as in bachelor's and master's education. Activities towards the public sector are also evident, whereas the typical unit has practically no activities in further education or transfer to the private sector.

A closer look at the data shows that there is much less variability in size than in activities and products, demonstrating that differences in profiles between units are quite significant. If we analyze variability within the sample by looking at the ratios between STED and median, and maximum and median respectively, we get the following picture:

- Variability is lowest for research training and science production (see especially the indicators on PhD students and publications); funding from agencies displays a higher level of variability.
- Variability is medium for undergraduate education, where the spread in the sample is not very high, but there are two clear outliers (one RU highly specialized in BA and one in MA). The same is true for public transfer, where a single RU features as a clear outlier.
- Variability is highest for further education and private transfer, where the typical RU in the field has no activity, but a small number of units have a quite substantial share of activities in this domain (as shown by comparing the maxima across different indicators).

In the following sections, we provide some summary information on the distribution of individual indicators across units.

5.2.1 Size and composition of personnel

As already explained, the distribution of size is quite graduated between a minimum of just 1.05 and a maximum of over 18 FTEs (see Figure 39). It is interesting to note that 8 out of 19 RUs have a single professor and thus can be characterized as the typical German chair model; 7 of these units are in fact

located in the German-speaking part of the country. However, only 3 RUs in the whole sample have more than 2 professors, including assistant professors.

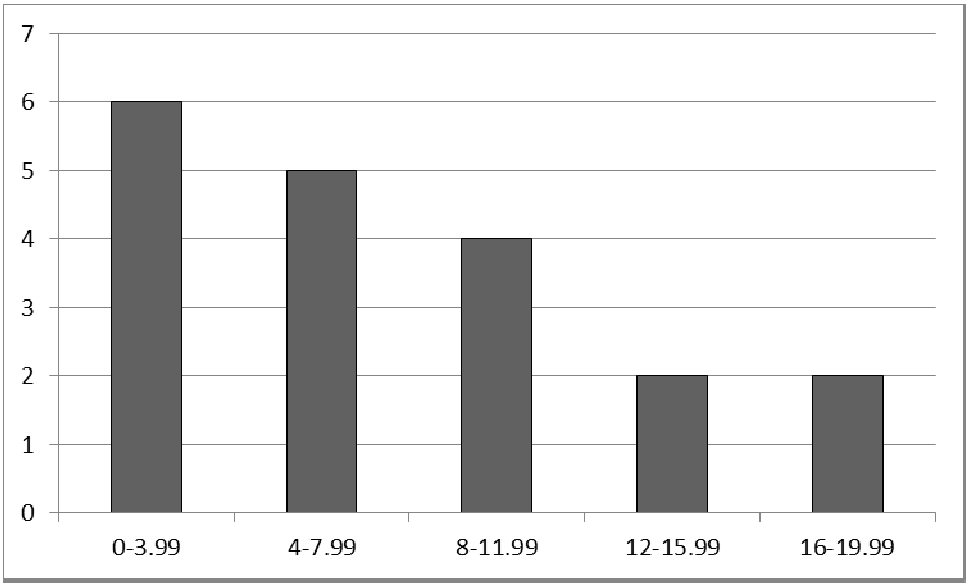


Figure 39. Distribution of RUs by size (FTE)
N of units in each category

When looking at the factors determining the composition of staff, and particularly the acquisition of non-professorial staff, some interesting results also emerge. While it might be expected that the number of faculty positions is significant in determining the number of other staff positions, our analysis only supports this hypothesis for PhD students, not for intermediary staff.

However, the data show that the level of temporary staff is explained essentially by the ability of RUs to acquire additional resources, as related to their activities (see Table 11). As a measure of additional resources, we use the volume of third-party funds in 2009, as well as the number of teaching hours organized by the RU (assuming that additional university budget is related to the amount of educational activities). Moreover, we take into account that RUs with a large volume of educational activities might hire external contract teachers for specific courses, using a share of the available resources for this purpose. Accordingly, we also include in the regression the number of teaching hours from teachers external to the unit. As dependent variable, we use the number of non-professorial staff in FTEs; while there are some differences in the salary level between PhD students and post-docs, these are quite limited in the Swiss context (PhD students tend to have lower employment rates to account for the time used for dissertations).

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.003345854	0.385726	0.008674	0.99318
Total hours organized	0.006629594	0.00079	8.388525	1.9E-07
External funds	8.89026E-06	8.57E-07	10.377	8.98E-09
Hours external	-0.007983849	0.001311	-6.08894	1.2E-05

Adjusted R Square	0.921860127

Table 11. Regression results for FTE non-professorial staff

We notice that adding the number of professors among the independent variables does not improve the fit (adjusted R Square 0.92) and it is not significant (p = 0.27), thus confirming that the whole effect of the faculty endowment is captured by the RU's ability to acquire external resources.

5.2.2 Acquisition of third-party funding

As Figure 40 below displays, differences in the acquisition of third-party funding are very pronounced, with one unit having no external funding and one unit approaching 1 mio. CHF in the year 2009. Five units received less than 100'000 CHF, while 3 units in the sample exceeded 0.5 mio. CHF of third-party funding in 2009. We also notice that while, generally speaking, private funding is low for most units, there is a single RU which acquired a substantial amount from this source.

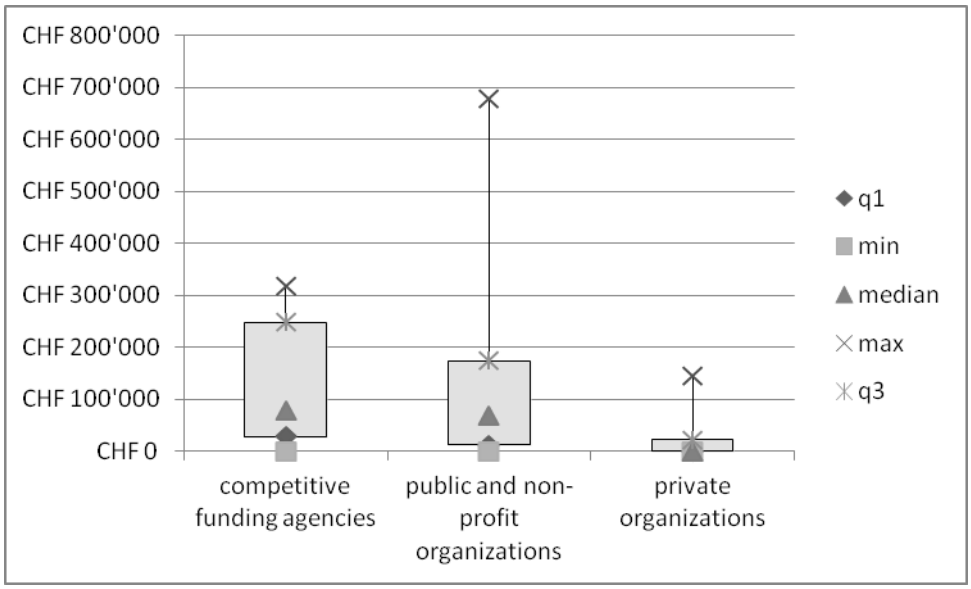


Figure 40. Third-party funding by RU
Absolute values, volume for the year 2009.

The data also display quite a strong differentiation of units in terms of their prevailing funding source, where four broad groups emerge (see Figure 41):

- A first group with low levels of funding both from agencies and public/private contracts.
- A second group of RUs which receive almost all third-party funding from public agencies, meaning essentially SNF projects.
- A third group of units which receive almost all third-party funds from public/private contracts, but very little agency funding.
- Finally, two units which are quite successful in both funding markets and reach the highest values of total third-party funding in the whole sample.

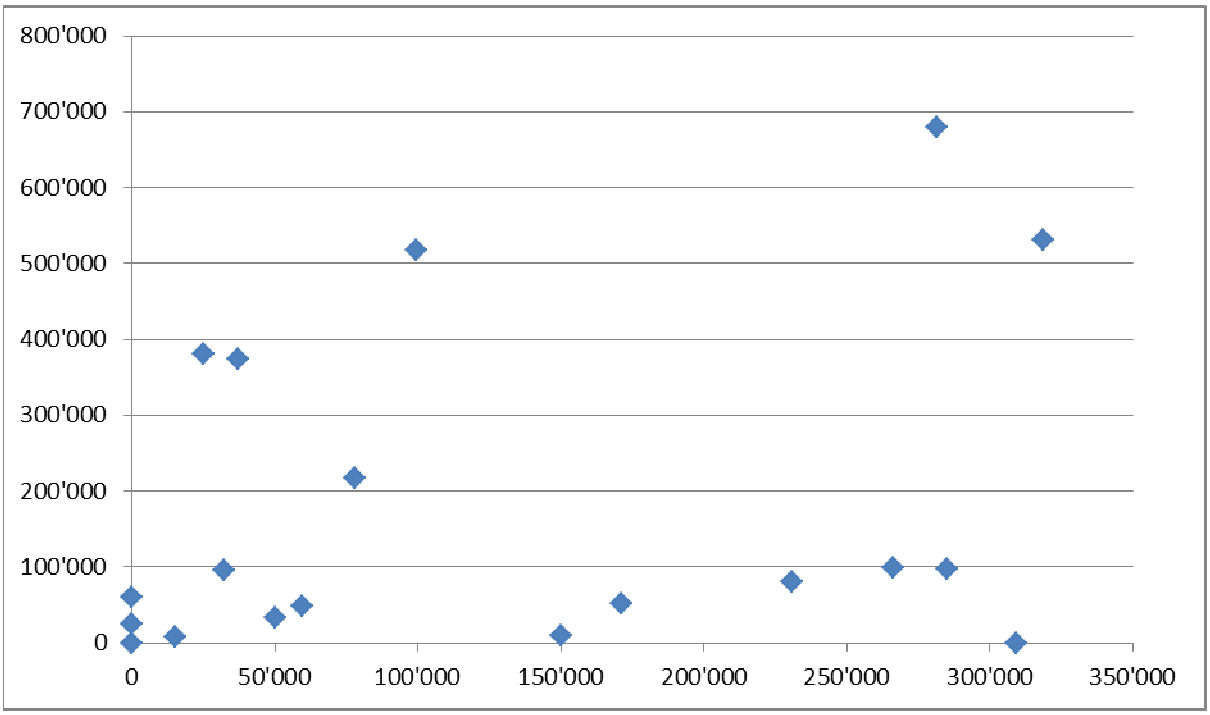


Figure 41: Funding source, competitive agencies vs public/non-profit organizations, RUs
Share of funds from competitive agencies on horizontal axis, share of funds from public and non-profit organizations on vertical axis. Residuals: share of funds from private organizations

The RUs are divided by the total amount of third-party funding.

When looking at relationships between funding acquisition and human resources a few relevant results emerge:

- Acquisition of funding from public agencies (SNF) is not correlated to any indicators of human resources. This is particularly true with regard to the number of professors (R2 = 0.13), which points to the fact that in the acquisition of SNF resources differences in the reputation of individual professors are probably more important than sheer numbers.
- In contrast, the correlation is quite high for public contracts (R2 = 0.69 for total staff), which suggests that the size of the RU largely determines the extent to which it can successfully execute public contracts (thus suggesting a situation where demand is larger than available capacity).
- Finally, there is no correlation between size of RU and acquisition of private contracts, as expected since this is a specific feature of a small number of units.

Of course, these results have to be treated with some care, firstly because the sample is very small, and secondly because most of these variables are endogenous and intercorrelated.

5.2.3 Educational activities

As already mentioned, there are very large differences in the levels of educational activity among the RUs in the sample; Figure 42 displays that while most units are in the range 100 to 500 teaching hours organized per year, there are extreme outliers – the RU with most educational hours organized exceeding 4'500 hours per year. Concerning further education, most units are not active in this domain, but a single unit organized about 800 hours teaching in 2009 and more than 80% of further education hours are organized by the two units offering a postgraduate master's.

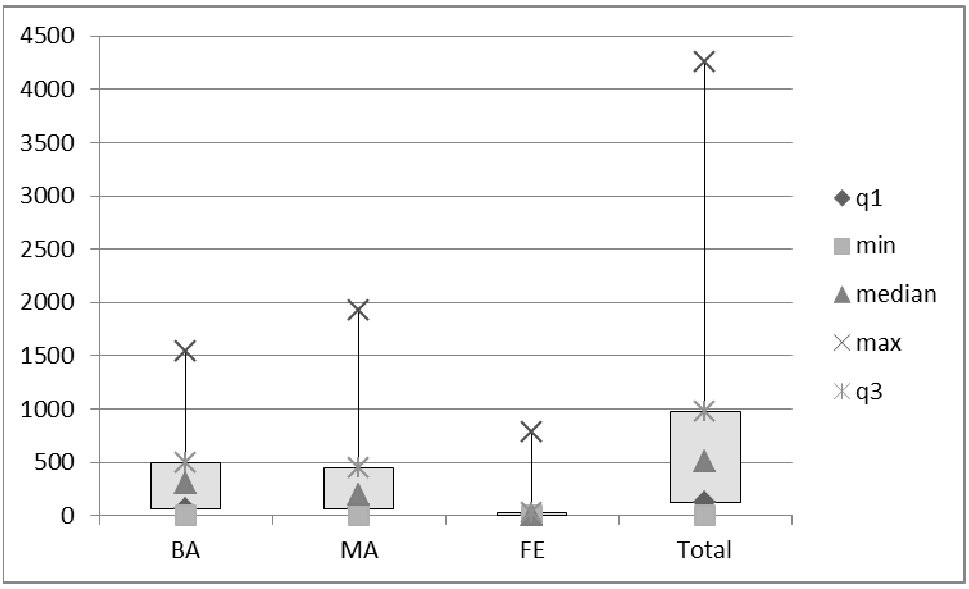


Figure 42: Teaching, 3 educational levels, volume

When looking to specialization by educational level (Figure 43), we notice a wide diversity of situations. Two units (2 and 16) are active only or predominantly at the bachelor's level, four units (8, 10, 17 and 19) mostly at the levels of master's and further education, while the other units display the balanced profile which would be expected from a regular distribution of students between bachelor's and master's (60% / 40%). Strikingly, of the units with a high level of educational activity, all but one (18) are specialized on a single educational level. Especially for master's and further education this might hint at some competition, where RUs extend their offer with specialized curricula in order to increase their level of educational activities and, correspondingly, to get revenues from this source.

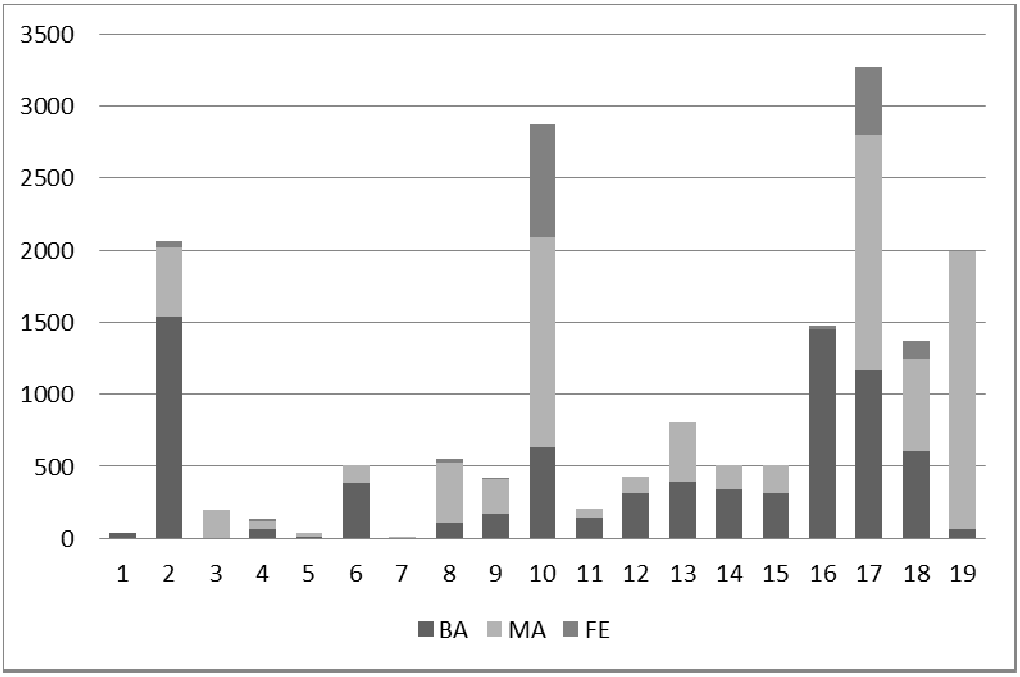


Figure 43: Teaching organized per educational level
Teaching hours organized

This interpretation is largely confirmed by the fact that the difference between teaching hours organized and taught by the RU staff – which can be viewed as the numbers of teaching hours bought from external teachers – increases linearly with the total teaching volume and thus, on average, half of the increase in teaching volume is met with external teachers (see Figure 44).

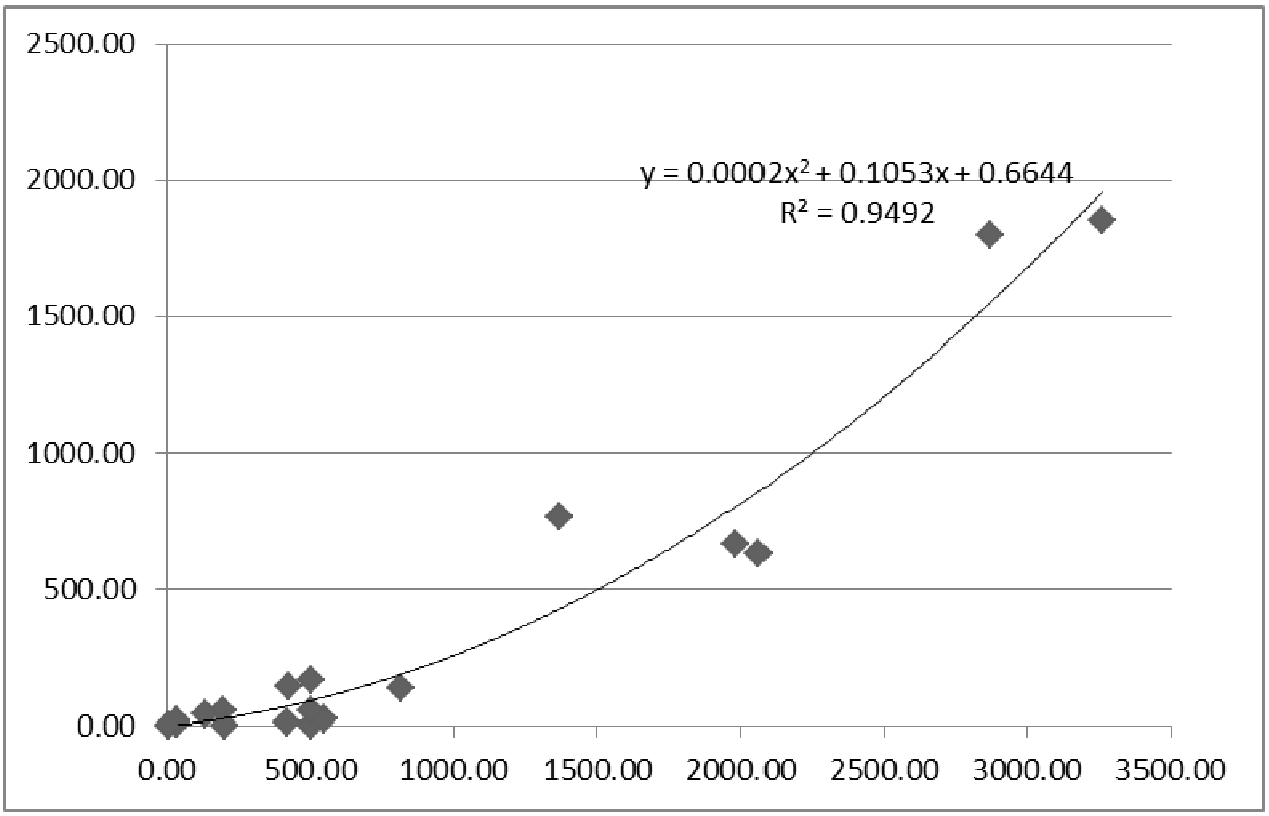


Figure 44. Total hours organized vs. hours from external teachers
X: total hours organized by the RU; Y: difference between organized hours and hours taught by the RU staff. The correlation excludes the only UAS-based RU as their organization of teaching is quite different, with a much broader recourse to external teachers than universities.

As the best fit is given by a quadratic expression (R2 = 0.95), this hints at scale effects: at low levels of educational activity a significant share of the increase in teaching can be satisfied by internal staff, whereas at the highest levels almost all the increase is met through external staff (if the number of organized hours is 3'000, 70% of the increase is accounted for by external teachers).

The expected implication is that the number of teaching hours per professor should increase at low levels of educational activity, but reach a plateau and stabilize when educational activities increase further; despite all the methodological caveats with the indicators, the results provide some support to this argument (Figure 45).

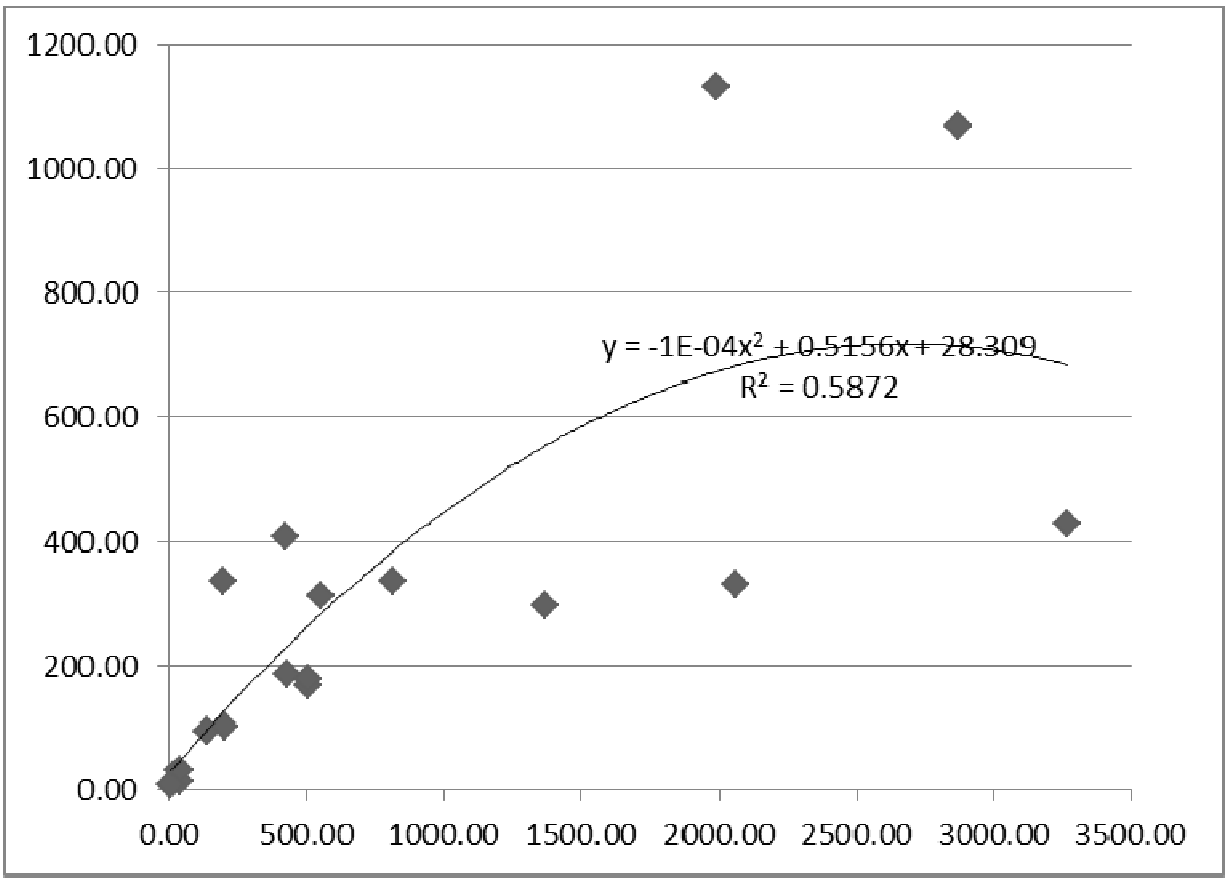


Figure 45. Total organized hours vs. hours per professors
X: total organized hours for each RU. Y: teaching hours per professors normalized FTEs.

The sample excludes the UAS-based unit as well as one unit for which data are unreliable as it has only 0,25 FTE professors.

5.2.4 Research training activities

As introduced in 5.2, research training is the dimension for which there are fewer differences between the RUs in the sample. Excluding the only UAS-based RU, which does not have the right to award a doctorate, and especially when normalized by the number of professors, the spread is not very large, particularly when considering that some outliers are related to problems of normalization (e.g. some RUs having very low FTEs of professors because of personnel changes during the year). At the same time, some concerns might arise regarding the workload for supervision of PhD students, as in 3/4 of the units each professor has to supervise more than 4 PhD students. The expansion of the field in terms of PhD education seems therefore to be limited by the number of professors appointed, despite a rather high level of variability (see Figure 47).

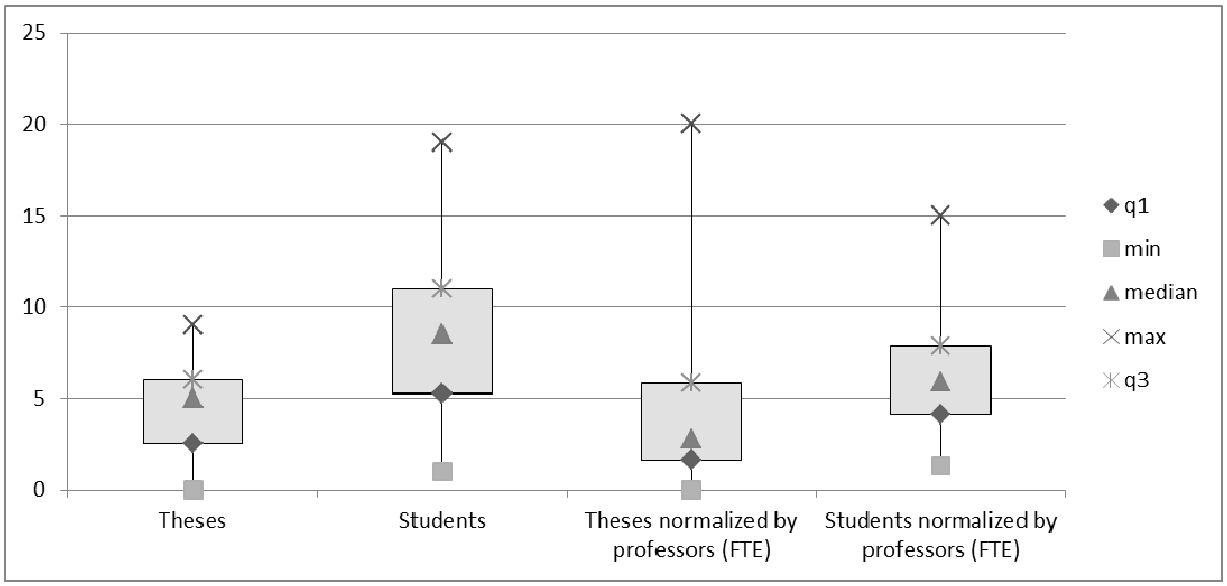


Figure 46: N of concluded doctoral theses (2005-2009) and of doctoral students (2009)
N = 18 (excluding the UAS-based RU)

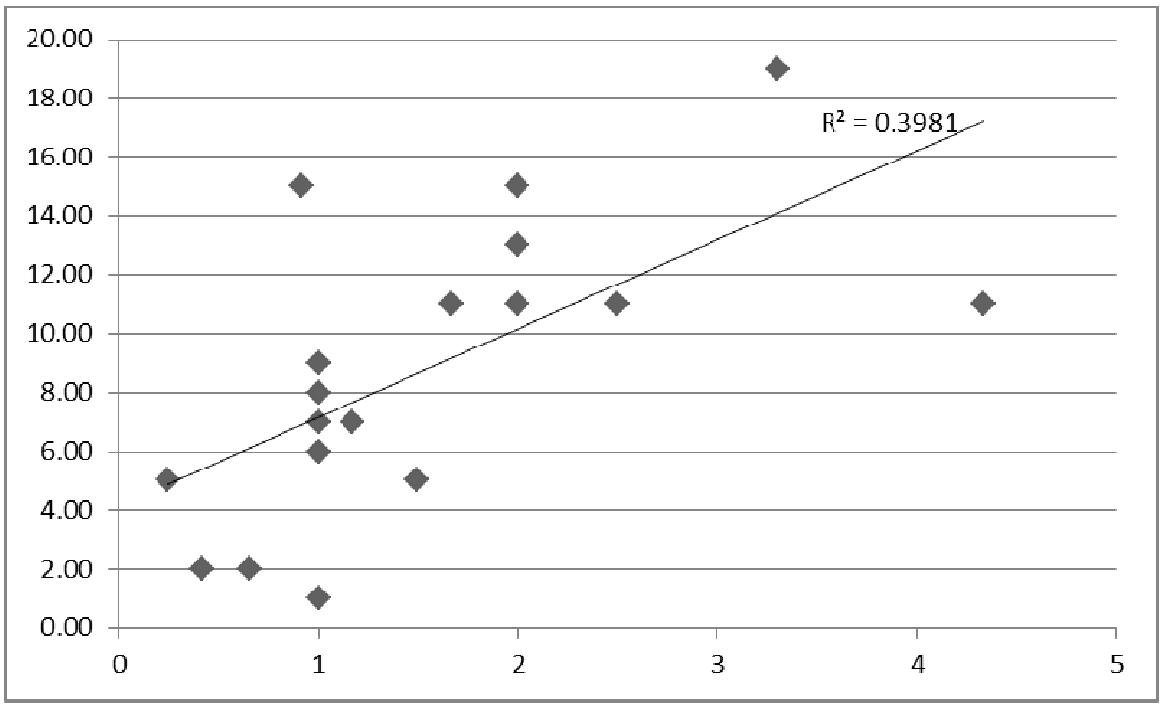


Figure 47. N of professors (FTEs) vs. doctoral students
N = 18 (excluding the UAS-based RU)

When looking at the publication activities of PhD students the differences between RUs are quite limited, as in all units most PhD students already have some publication activity (Figure 48), the only outlier being a unit recently restructured, where all PhDs started in 2008 and 2009. In general, the figure of less than 1/3 of PhD students not having a publication activity has to be considered quite normal given that many students started in 2008 and 2009.

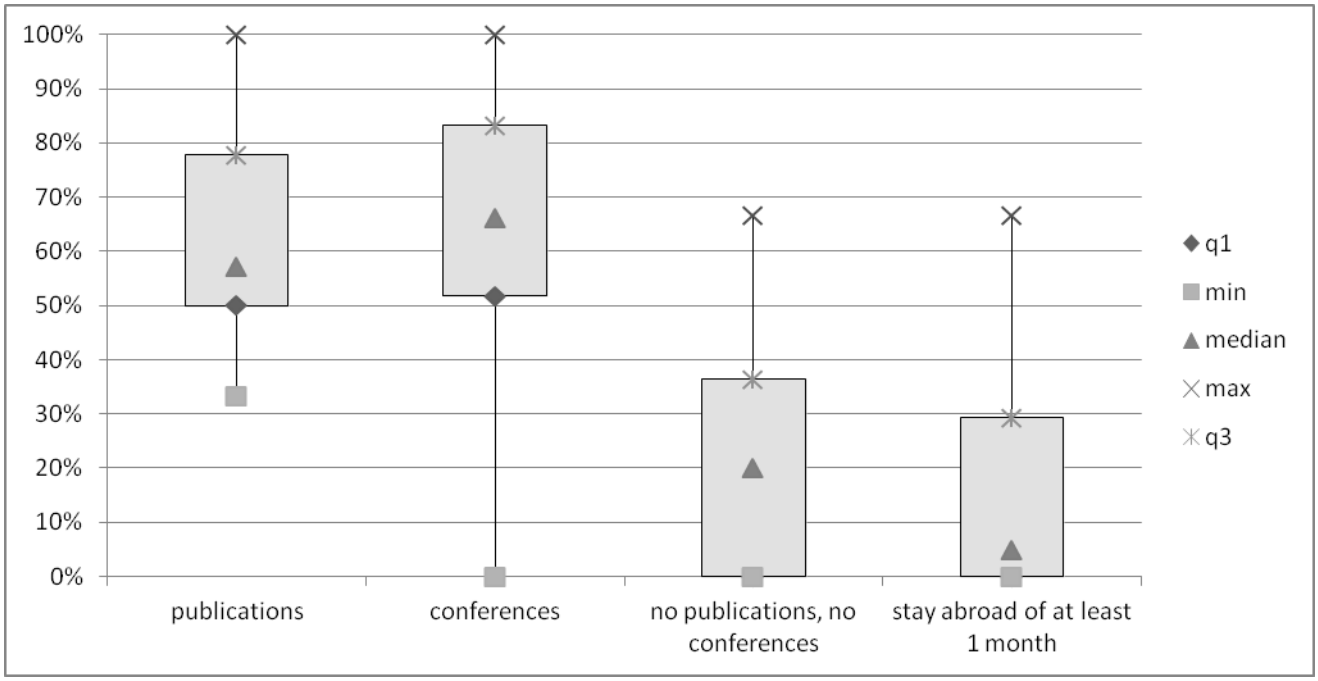


Figure 48: Share of doctoral students with activities
Percentage of doctoral students having each activity per RU.
publications = doctoral students at least 1 publication; conferences = doctoral students with at least 1 conference presentation.

However, it should be noted that these data are of limited value as there is no consideration of the quality of publication; in fact, early publication activity could suggest either good progress and visibility of scientific work, or publishing in lower-level journals (the time taken to publish in the high-tier journals in some fields is 2-3 years). Indicators on the career path and publication output of doctorate recipients in the field would be much more valuable in order to measure the quality of doctoral education. More indications could be provided by a careful analysis of publications lists and type of media where PhD students publish.

Striking differences emerge concerning stays abroad. Not only is the average percentage of PhD students having a stay abroad more than double in the Italian speaking RUs compared with the others (27.7% against 10.7%), but most RUs in the German- and French-speaking universities did not have any student stays abroad. The practice is more widespread in the Italian-speaking universities – in most units more than 1/3 of their students had a stay abroad during their doctorate (Figure 49).

This might relate to different institutional policies concerning the mobility of researchers; in light of the debate concerning the importance of international mobility for research quality, this result and its implications need to be carefully assessed.

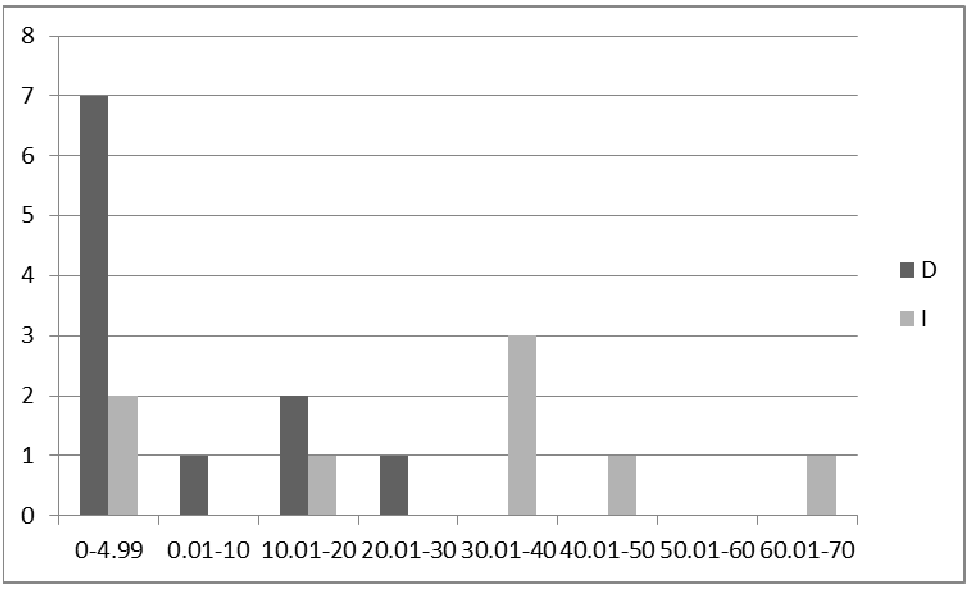


Figure 49: Share of doctoral students with stays > 1 month abroad
Average of shares of RUs, N of research units in each class; D includes also the only French-speaking unit.

Regarding doctoral education, the data display a strong division within the sample**,** with a group of 5 units organizing a sizeable number of hours of doctoral training (more than 80 hours per unit in a year), while the remaining units offer practically no education at the doctoral level. Of course, this needs to be relativized, as doctoral students might follow courses offered in their broader environment (department, faculty), and the university regulations might not foresee that the RU organize such an offer, but nonetheless it can be seen as an interesting indicator concerning the offer of field-specialized doctoral education.

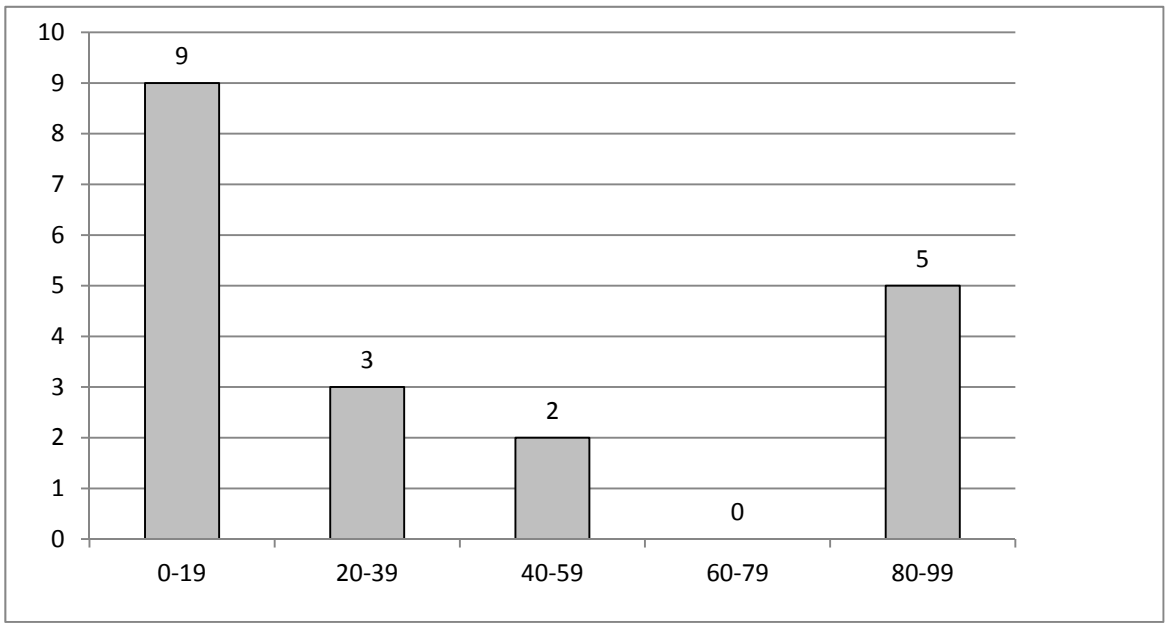


Figure 50. Hours of doctoral training
N. of hours organized by the research units; year 2009.

5.2.5 Research output

A comparison of the publication output of the RUs in the sample needs to take into account the limitations of the currently available data: as they are essentially based on the publication lists of individuals, there are limited indications regarding the quality of publications as it would be measured, for example, through the analysis of citation data. Nevertheless, these data do provide valuable information concerning:

- The volume of publication output and its relationship to the size of the unit (using different measures of size).
- The composition of publication output and the publication behavior of individual RUs concerning choice of media and language of publication.
- The cooperative relationships among RUs and with other research institutions in Switzerland and abroad (through the analysis of coauthorship networks).

a) *Volume of publications and relationship to size*.

The total number of publications per RU ranges from a minimum of 9 to a maximum of 133. As we would expect given the highly skewed distribution of individual productivity (see chapter 4.6), the relationship between size and number of publications is very weak (see Figure 51), because the major determining factor of RU scientific production is the presence of one of the few high-output people (15 individuals accounting for more than half of the total publications in the whole sample). While acquiring resources through education and research contracts might allow RUs to grow in size and, in particular, to expand their number of post-docs and senior researchers, the increase in scientific output remains largely dependent on hiring highly productive people.

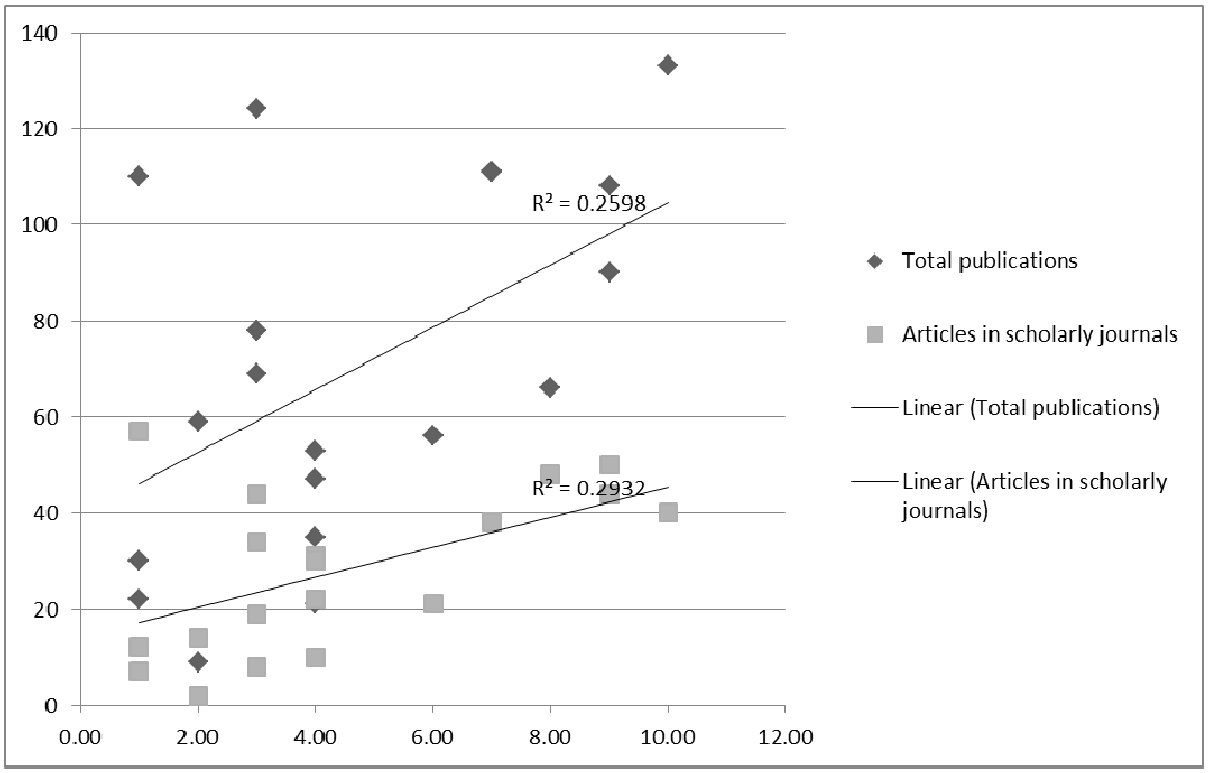


Figure 51. N of publications compared to unit's size
X: Headcount of professors, senior researchers and post-docs; Y: number of publications

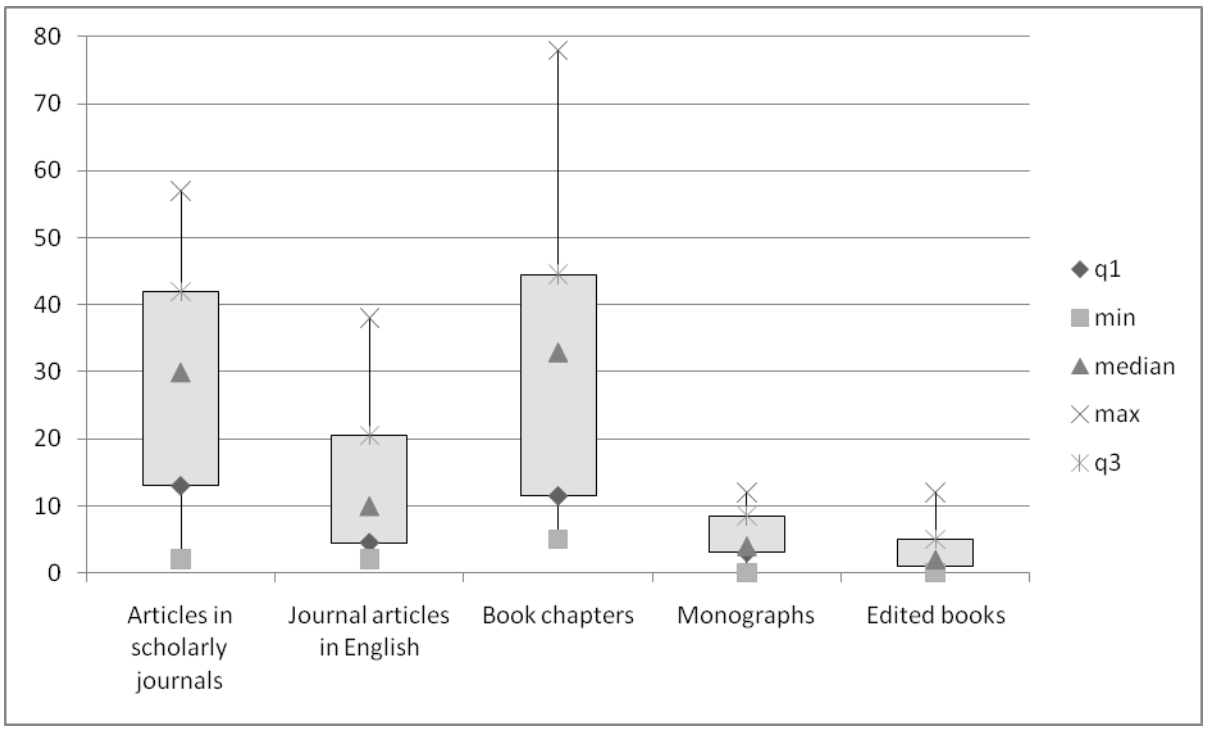


Figure 52: Publication type, distribution
Volume

b) *Patterns of publication by media and language*.

A significant feature emerging from the analysis of publications is the presence of different publication styles in the linguistic regions of Switzerland. This difference concerns both the choice of publication media and of publication language. However, the distinction largely overlaps with the one between mass communication and interpersonal communication. Of course, both distinctions might combine to explain these differences, but Figure 53 clearly shows that the subfield is the most relevant factor, as the only institute in Lugano focused on mass media has both a low share of journal and of English publication, while the reverse pattern is displayed by the only institute in the German-speaking universities focused on interpersonal communication. The only institute in the French-speaking part of Switzerland occupies a very specific place, as its head comes from a background of long research experience in the UK, thus explaining why all its publications are in English (if we include the last five year's publications of the current staff).

The two subfields of communication thereby display strikingly different publication characteristics, with mass media being oriented towards their own linguistic community and publishing largely in book form, while publication in English-speaking journals prevails with interpersonal communication. Of course, these different patterns of publication raise major issues when comparing units and trying to evaluate their research output. A quite similar pattern emerges concerning the place of scientific conferences (Figure 55).

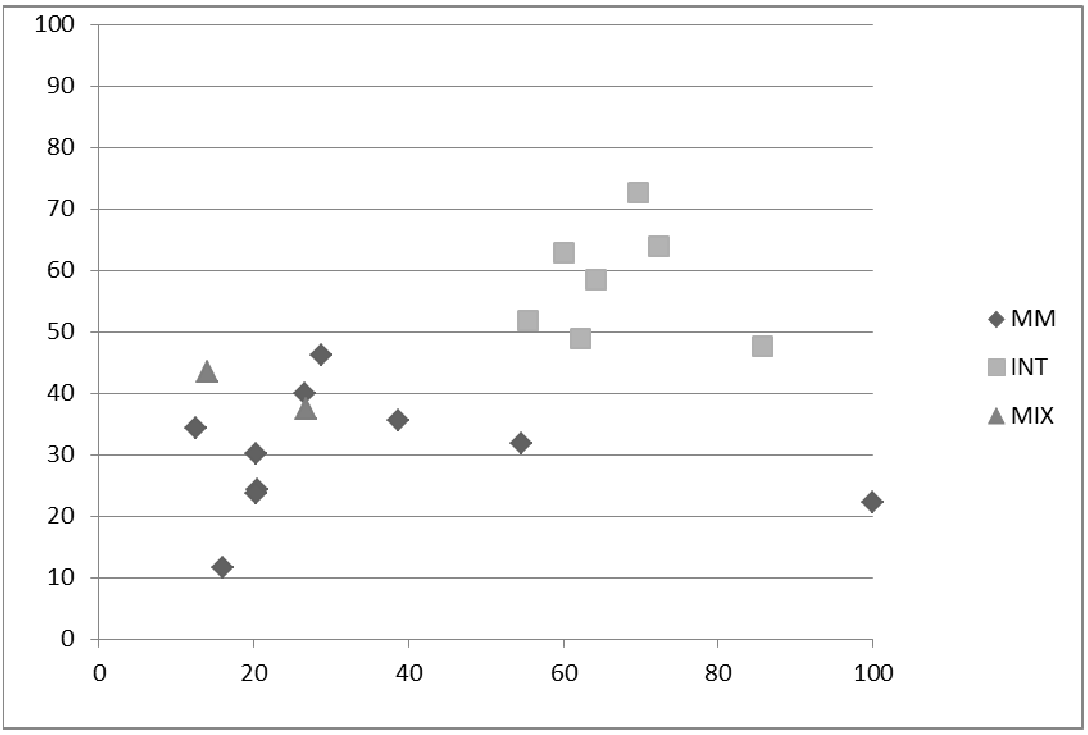
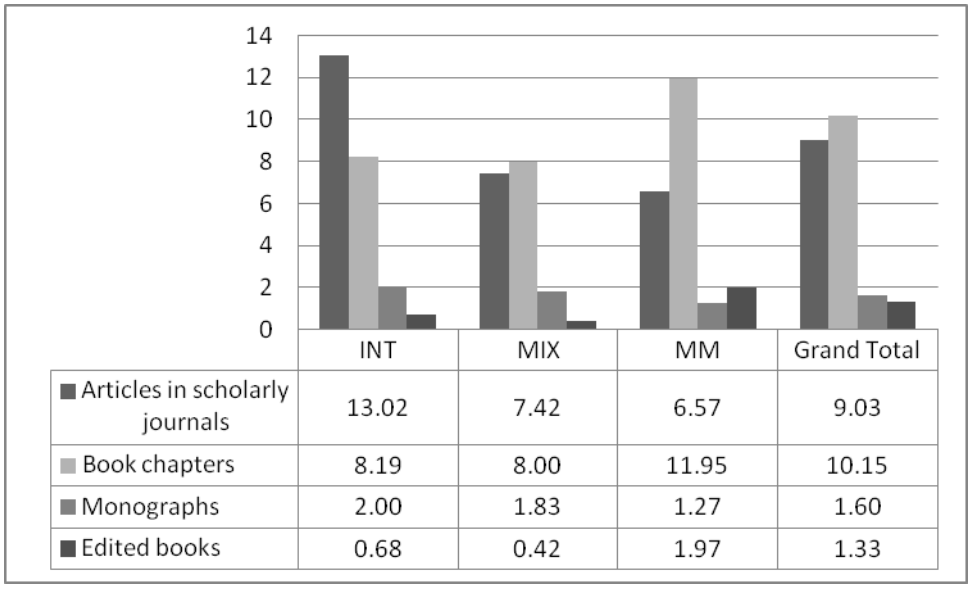


Figure 53: Publications in English vs. publications in journals
X axis: % of publications in English; Y axis % of publications in journals.



	INT	MIX	MM	Grand Total
Articles in scholarly journals	13.02	7.42	6.57	9.03
Book chapters	8.19	8.00	11.95	10.15
Monographs	2.00	1.83	1.27	1.60
Edited books	0.68	0.42	1.97	1.33

Figure 54: Publication types vs. field of RU
Average of size-normalized (HC2) data

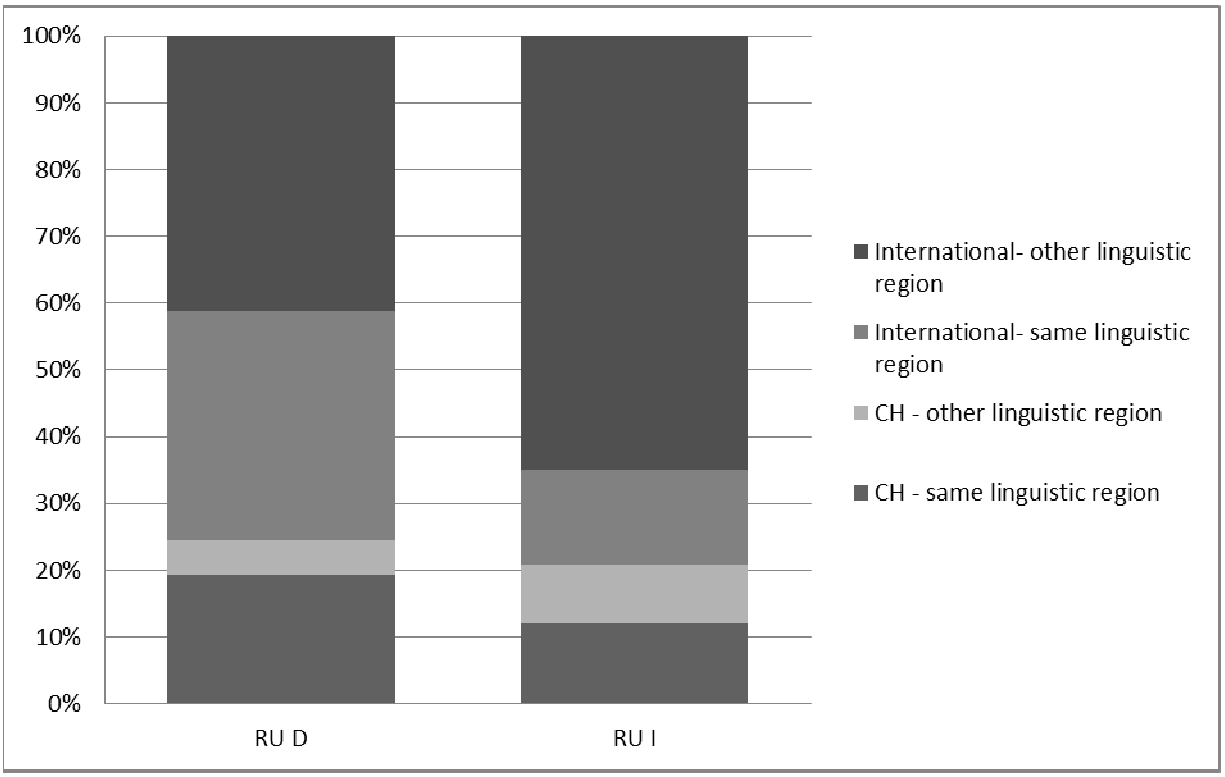


Figure 55: Place of conferences by linguistic region of RU
Share of total number of items per linguistic region (sum of publications of all RUs for each linguistic region)

c) *Collaboration patterns*.

The publication database contains information on all authors of the publications, including their name and affiliation at the time of publication. Overall, the 1335 publications involved 2526 authorships, of which 1760 are attributed to people employed at an RU of interest in this report at the moment the publication was written. When looking at the current composition of the RUs, the picture is similar: 1705 authorships are attributed to people employed at the RUs at the end of 2009, regardless of their affiliation at the time of publication.

Of the 1335 publications, 7 have authors from three different RUs in the sample (3 of which also have further external authors). In three cases, the 3 RUs are from the same university, and the other four cases are collaborations between two universities or a university and a UAS. Forty-nine publications are collaborations between two different RUs (4 of them including further external authors). Twenty of these publications are written between two different higher education institutions; however, around half of these collaborations are explained by the fact that two co-authors used to be colleagues at one unit, with one now employed at another unit.

Collaboration with units not included in the sample is more frequent: of all the publications 384 are collaborations between more than one unit (including external units), while 951 have authors from just one unit. In the overall sample, external collaborations occur most often within the German-speaking part of Switzerland, followed by the Italian-speaking part (see Figure 56). The low representation of the French-speaking part in this figure reflects the fact that only one unit from this part of Switzerland is included in the sample.

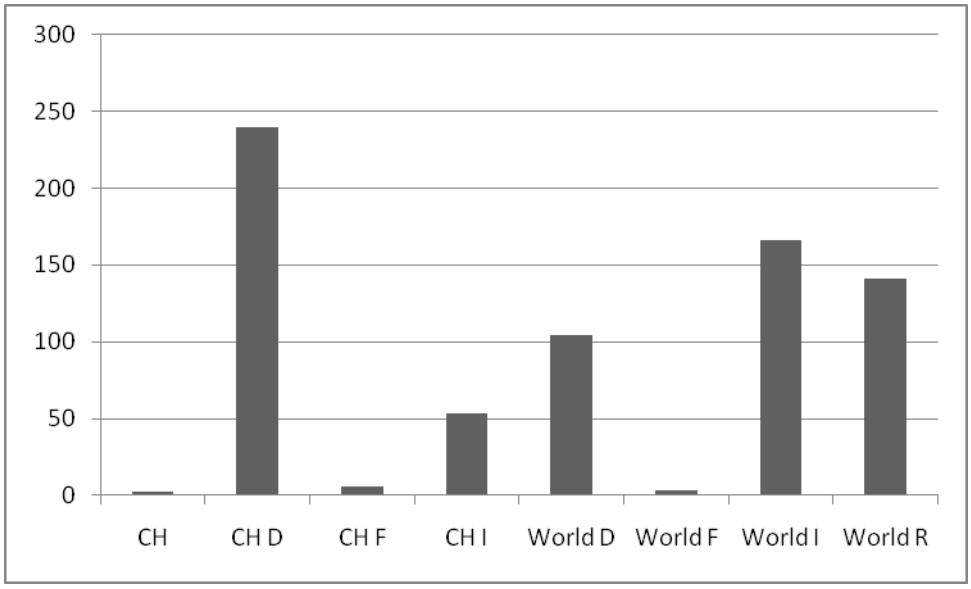


Figure 56: N of external co-authors, provenience

Only one of the 19 units does not have any publication in the database which was written in collaboration with somebody from a unit outside our sample. For all other units, Figure 57 shows the provenience of co-authors. This figure clearly shows that collaborations usually take place within the same linguistic region. The only exception – a unit from the Italian-speaking part of Switzerland with many co-authors from German-speaking regions – is explained by its composition: one professor in this unit has German origins, both personally and academically.

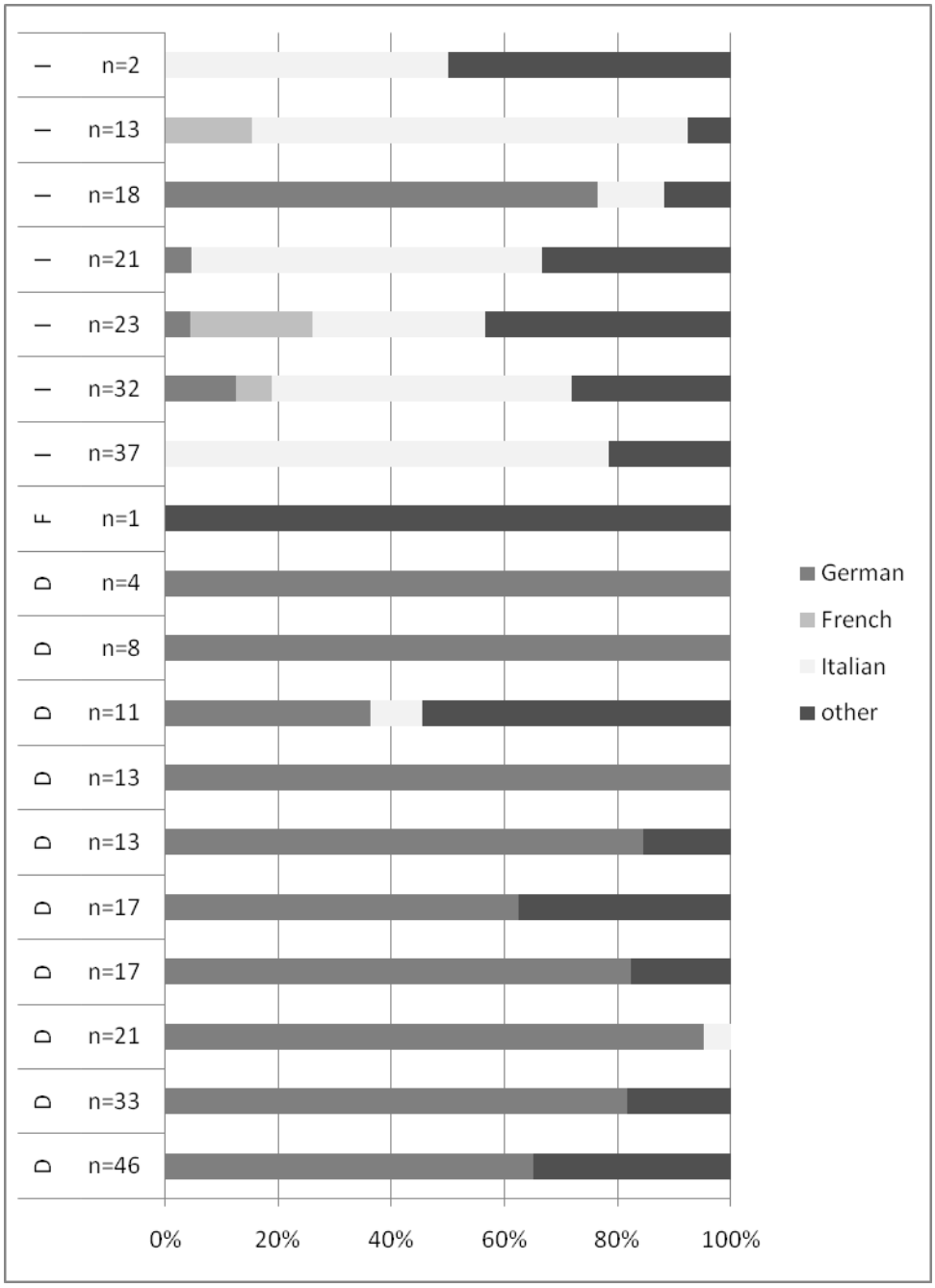


Figure 57: Provenience of co-authors, linguistic region of unit and N of publications with external co-authors
German = sum of publications with at least one co-author from German speaking part of Switzerland (without considered RUs) and other German speaking countries (e.g. if 1 co-author from Berlin -> publication counted as 1; if 3 co-authors from within Switzerland -> 1, if 1 co-author from Berlin, 1 from Hamburg and 1 from Bern -> 2). Same rules for French and Italian, other = other countries (not German-, French- or Italian-speaking).

d) Productivity of intermediary staff

As shown by Figure 58, the different groups of RUs do not differ significantly in the level of publications of intermediary staff, except that only the RUs in groups 1 and 2 with the highest levels of professorial publications include some intermediary staff with high level of publications (N>20 in the years 2005-2009).

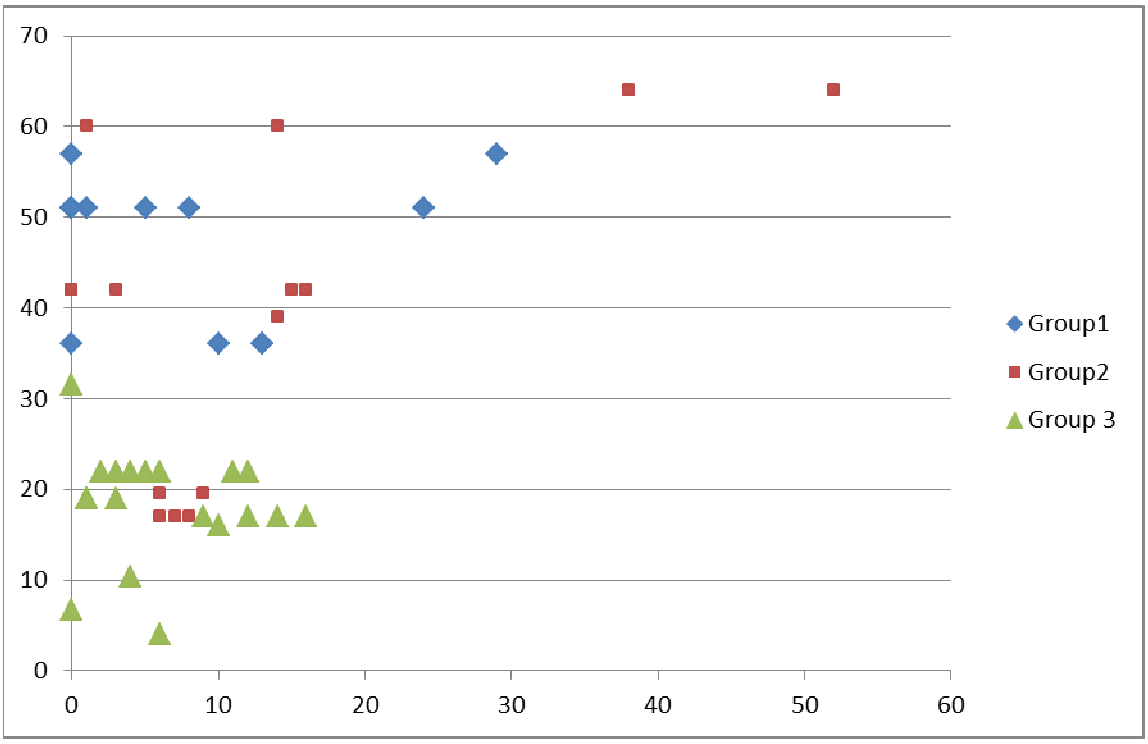


Figure 58. Publications of intermediary staff vs. professors
X: publications of intermediary staff 2005-2009; Y: average number of publications of professors in the same RU 2005-2009.

The interpretation of this pattern requires some care, as cohort effects might be relevant; however, the average date of PhD of those 4 people with more than 20 publications in the 5 year period is not significantly different from the average of the whole sample. Our interpretation is that, generally speaking, hiring post-docs is not meant to promote their academic careers, but rather allow RUs to master their activities, especially contracts and education (as the large number of post-docs in RUs 1 and 3 displays). At the same time, only RUs where professors have a high level of scientific output might provide a fertile environment for individuals striving for an academic career.

5.2.6 Transfer activities

Transfer towards the public and private sectors is measured both through input from these organizations (funds, Figure 59) and output to these organizations (Figure 60). While for units in the German-speaking part of Switzerland, the share of public vs. private is quite similar for input and output (a unit average of 69% and 75% public), the units in Lugano receive nearly all of their input in this dimension from public organizations (96%), but also average one quarter of their overall output towards private ones.

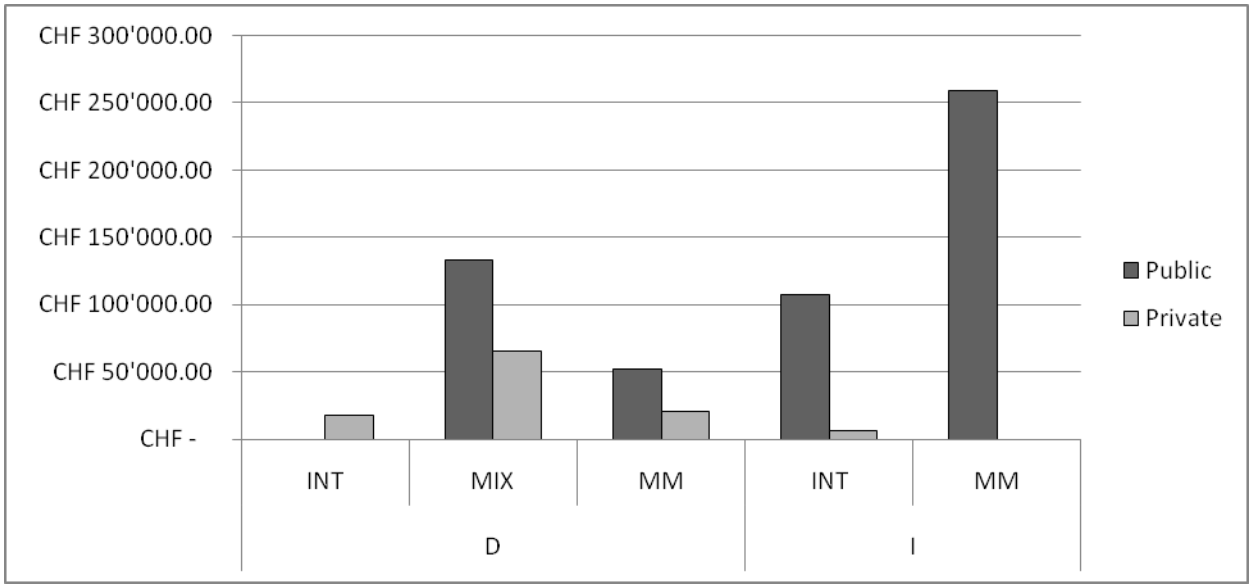


Figure 59: Funds from public and private organizations
Averages of size-normalized funds of all RUs in each category

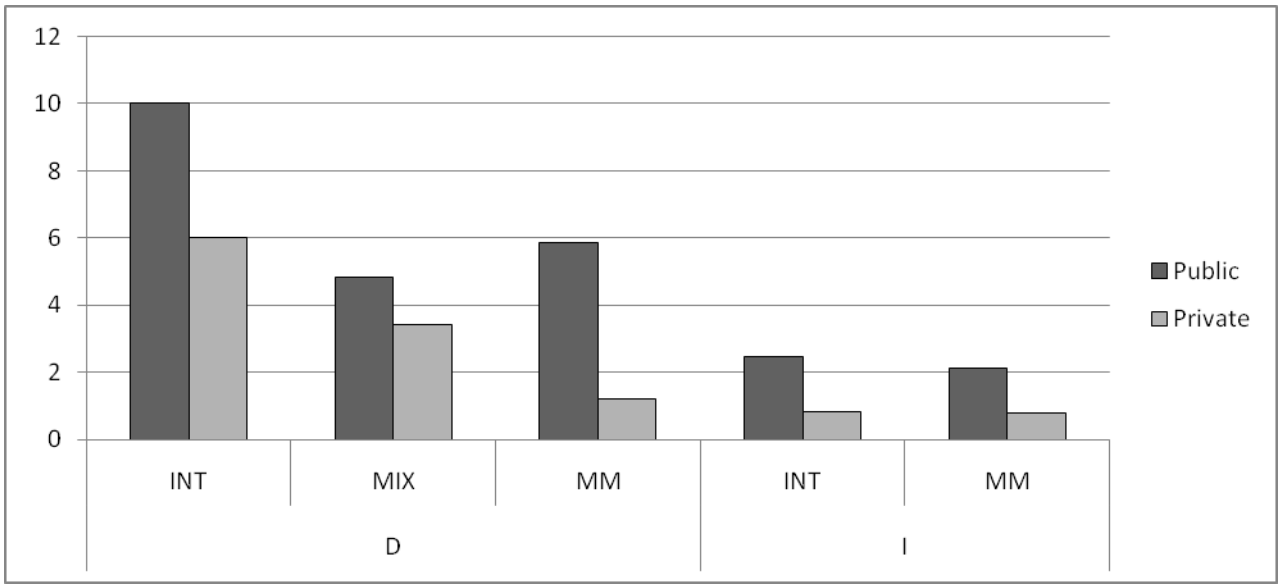


Figure 60: Activities for public and private organizations by field and linguistic region of RU
Averages of size-normalized activities of all RUs in each category (without media presence)

Regarding media presence, a difference between the disciplinary orientations is visible: units focusing on mass media communication or mixed in their orientation have more presence in newspapers than those focusing on interpersonal communication (Figure 61).

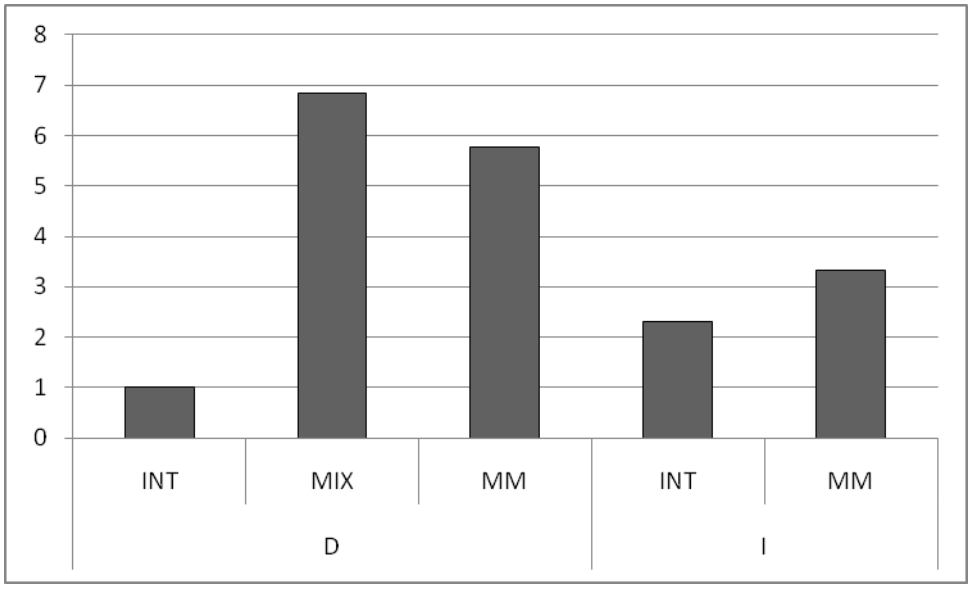


Figure 61: Media presence by field and linguistic region of RU, 2009
Average of media presence for all RUs in each category

5.3 RU profiles and their diversity

To analyze diversity in profiles we make use of the methodology explained in chapter 3.5; thus, each unit is compared to a benchmark constructed as the median of the whole sample, corresponding to the data presented in the previous section. We use volume-based profiles, as no straightforward assumption is possible with regards to whether different activities scale according to size.

METHODOLOGICAL NOTE

The profiles displayed are volume-based profiles, i.e. they do not take into account the size of the units. However, they are scaled based on the total score of each unit in order to allow for a comparison (otherwise larger units would tend to display higher scores). Accordingly, for each unit the total sum of scores is 0. Moreover, the scores are calculated as the simple ratio of indicators for each unit to the median; this means that the variation can differ by dimension considered.

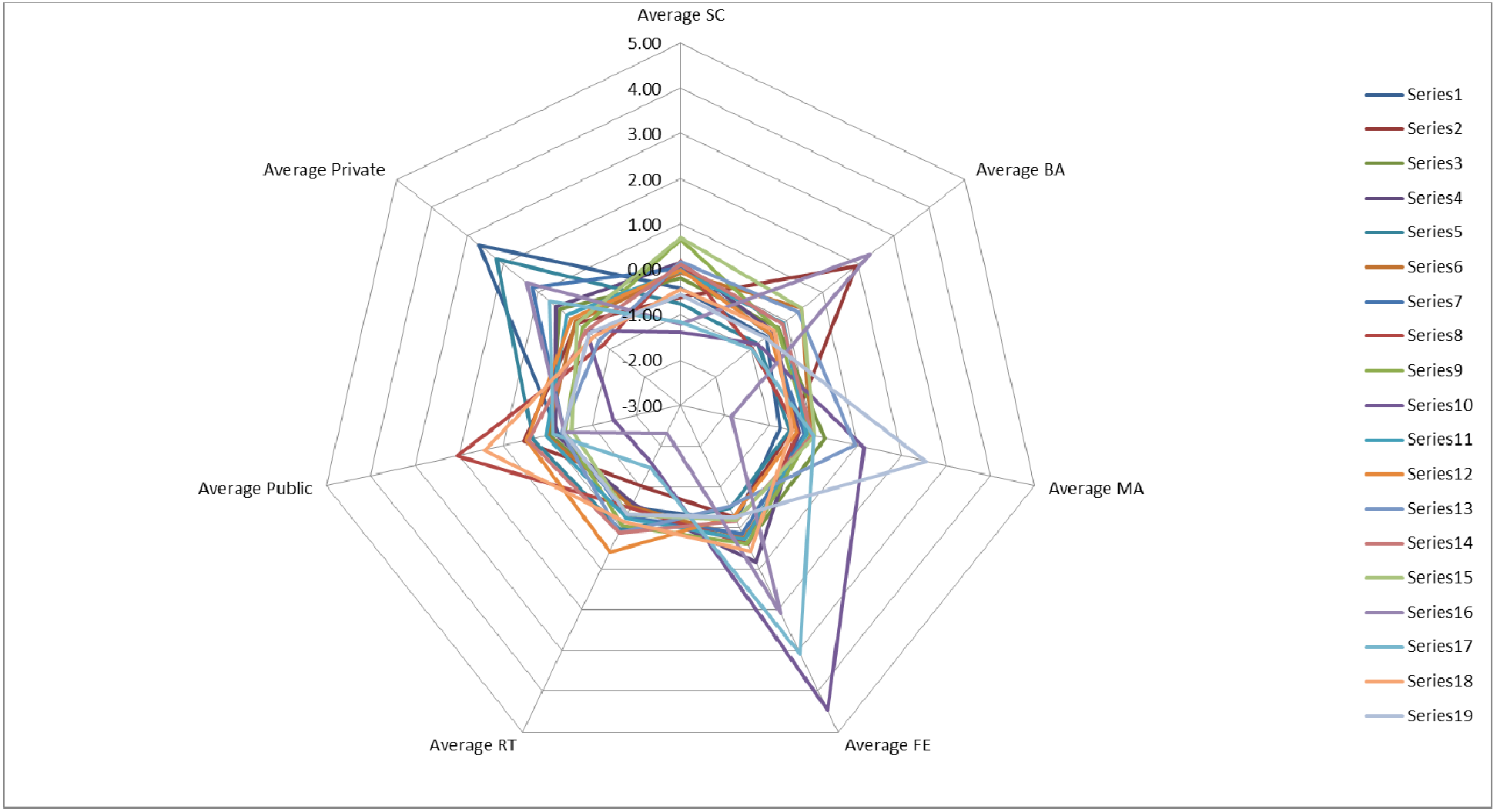


Figure 62. Profiles of individual research units

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A quick inspection of this figure readily displays that there is a group composed of units which are near to the benchmark for almost all dimensions, as well as a (smaller) number of units which clearly show specific orientations.

If we count in the first group those units whose average scores don't differ more than 50% from the benchmark and where no individual score is more than 100% above or below the benchmark (the three criteria being satisfied together in nearly all cases), 10 units out of 19 are included.

A closer look displays a rather systematic pattern in the composition of the two groups (Table 12): group 1 (those near to the benchmark) is composed mainly of RUs in Zurich (4 out of 4) and Sankt Gallen (3 out of 4), whereas group two includes most units in Lugano (5 out of 7). The units in group 2 are much larger than those in group 1 and display more of a focus on interpersonal communication.

	N	Size (FTE)	Location	Subfield
Group1	10	4.7	Zurich (4), Sankt Gallen (3), Lugano (2), Neuchâtel (1).	MM: 7 INT: 3
Group2	9	11.1	Lugano (5), Bern (1), Fribourg (1), Sankt Gallen (1), ZHAW (1)	MM: 4 INT: 5

Table 12. Characteristics of the two subgroups of RUs

5.3.1 Looking into specialization patterns

While, broadly speaking, group 1 can be characterized as the typical model of social sciences and humanities in Switzerland, with a fairly balanced distribution of missions between undergraduate education, PhD education, science production and transfer to the public sector, group 2 is composed of RUs with specific orientations towards quite different single dimensions of activity. Namely, we find the following specializations (with scores 100% above the benchmark):

- 2 units strongly specialized in bachelor's education.
- 2 units strongly specialized in master's education.
- 3 units specialized in further education.
- 2 units specialized in public transfer.
- 3 units specialized in private transfer.

This list displays two interesting features: firstly, there are no units strongly specialized in science production and research training, meaning that the importance of these two dimensions varies relatively little in the whole sample. Secondly, with the exception of the single unit in a UAS, all other units are distinguished by a single dimension, which represents their main direction of specialization (as displayed by Figure 63).

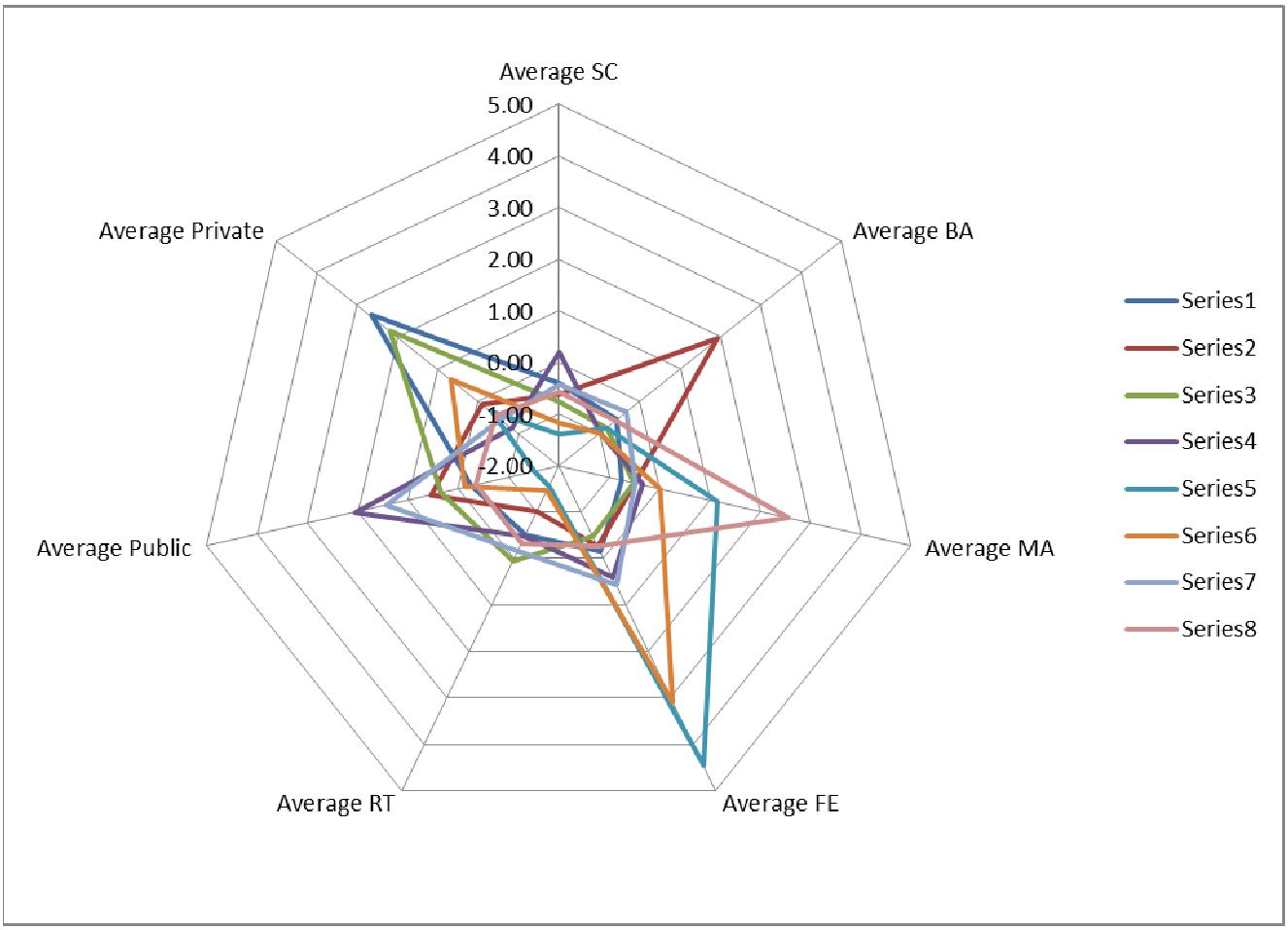

Figure 63. Profiles of the specialized units
The figure excludes the only UAS unit, which is analyzed in the next paragraph.

We interpret this observed pattern in the following way: the specific orientations represent distinct resource spaces where the individual RU can acquire a higher level of resources by specializing in some activities – either on a single level of education or by getting private and public resources through contracts. As displayed by Figure 64, the "specialized units" display far higher levels of activity than the generalist units in all dimensions – also related, of course, to their larger size – except for science production and research training, where the volume of activities is only slightly above the generalist RUs.

This leads to the hypothesis that only a limited share of the additional resource endowment from activities like education and contracts can be reused in order to increase science production and research training, as these activities themselves require substantial staff time and, possibly, competencies which don't entirely match those required for science production. We will look in more depth at these relationships in the next section by examining the correlation between individual variables.

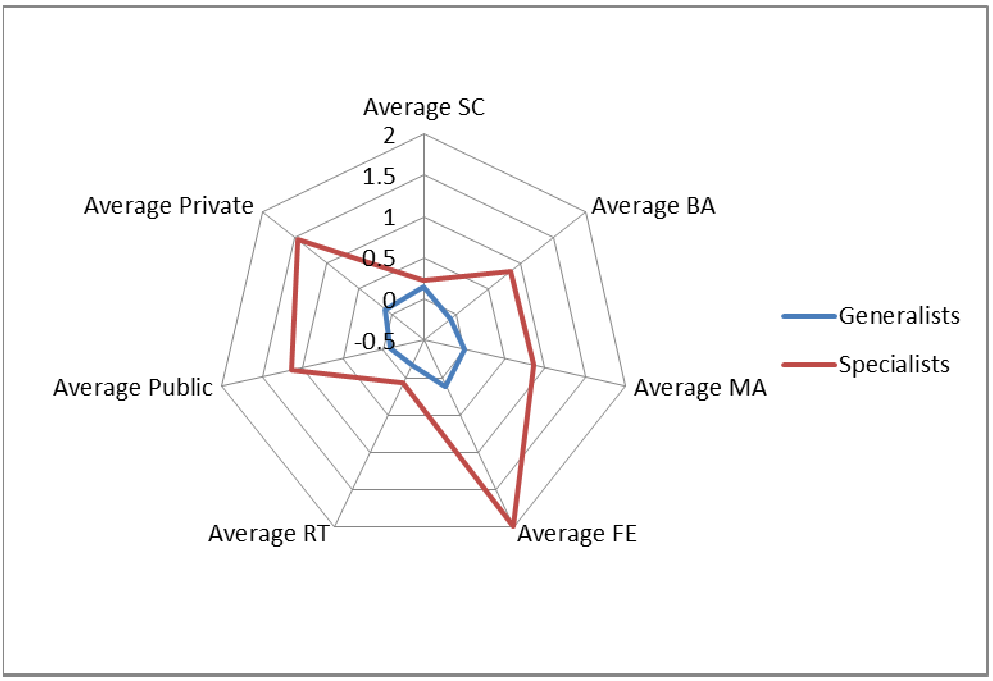

Figure 64. Volume-based profiles by type of RU
Profiles against the sample median by volume.

5.3.2 Comparing universities and UAS

A comparison between the average of the 18 university units and the one RU in a UAS displays the expected outcome, namely a profile much more strongly oriented towards bachelor's, further education and private for the UAS unit (Figure 65). This corresponds neatly to the distinguishing profile of UAS; we notice that, while there are other units which show profiles rather different to the average, in absolute terms this unit is the most distant from the average and the combination of priorities is unique to this unit.

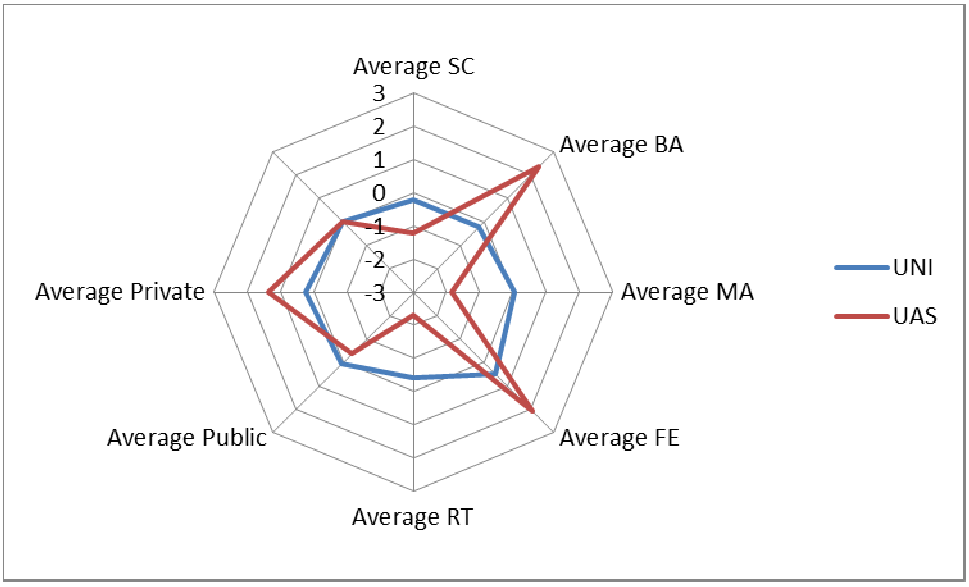

Figure 65. Profiles of universities vs. UAS units
N = 18 (universities); N = 1 (UAS)

5.4 Profiles and resource acquisition strategies

The final issue we deal with in this chapter is the extent to which it is possible to explain the observed profiles as the outcome of the interaction between the assets available to the RU on one hand, and the

resources offered by the environment on the other. This is of central importance in attempting to move from a purely descriptive approach to some explanation of the RU patterns of activity and to derive implications for strategic decisions at the university level.

The conceptual basis for this analysis is represented by so-called *credibility cycles*. This notion was introduced by laboratory studies in order to represent the relationships between acquisition of financial resources, RU activities and scientific credibility (Latour and Woolgar, 1979). In this model, the basic currency in science which allows the acquisition of financial resources is scientific credibility, defined as the recognition gained from peers through scientific work and publications (Joly and Mangematin, 1996). Accordingly, research units engage financial resources to acquire productive resources – e.g. human capital and infrastructure – in order to undertake scientific work, which might eventually lead to results recognized by the scientific community. Thus, the credibility cycle connects the production structure at the RU level with the overall reward system of science – mediated through peers – which controls the distribution of financial resources.

However, there are usually different spaces for the allocation of resources, related to different audiences – e.g. science, policy, private companies. While most of them will consider scientific credibility as a relevant input for their decision, they are likely to value it differently and to take into account other criteria as well, such as reputation – a generic term qualifying behavior during contracts, including in-time delivery, reliability, etc. (Joly and Mangematin, 1996). Furthermore, potential funding sources also differ in the type of products and activities required (for instance, funding for education might also be partially related to scientific credibility, but teaching hours nevertheless have to be taught), the type of resources the funding allows and the related time horizon. Table 13 provides, for the specific case of Swiss communication sciences, a brief outline of the main available funding sources.

Funding source	**Relevant audience**	**Valuation criteria**	**Expected products**	**Resources funded**	**Time-window**
Core allocation from the university	University / Faculty leadership	Scientific credibility Educational activity Strategic importance	Scientific publications, teaching, PhD education, funding acquisition	Faculty positions Temporary staff Infrastructure and other costs	Faculty positions: long Temporary staff and costs: short/medium (1-2 years)
Research council grants (Swiss National Science Foundation)	Peers	Scientific credibility	Scientific publications	Temporary staff (PhD students)	Medium (2-3 years)
Public and private contracts	Public administration and private companies	Reputation Scientific credibility	Reports, consultancy	Temporary staff, other costs	Short (1-2 years)

Table 13. Characteristics of the funding sources in Swiss communication sciences

However, RUs need to match their funding acquisition with the organization of activities and the delivery of results, thus providing the basis of future acquisition through the credibility and reputation gained. We consider that in communication sciences, human resources represent the core of their productive resources. Not only is it the case, at least in social sciences, that most of the RU budget is spent on human resources, but this is also where the key competences required for almost all RU activities are found. In addition, at least in small units, individuals hold much of the scientific credibility and social ties which are relevant both for developing research and for acquiring external resources.

As we have shown, the RUs in our sample can utilize three main staff types (see Table 14). Professors are hired through well-established procedures at the university level and funded through the university budget on permanent positions (with the exception of assistant professors appointed for 4-year terms). Lecturers,

post-docs and PhD students are hired on temporary contracts subject to decisions taken at RU level (or faculty level for lecturers) regarding the extent of financial resources available. Finally, external teachers are hired in order to teach specific courses on a yearly basis.

Type of staff	Level and duration of employment	Funding sources available	Renewal time	Role and criticality
Professors	Mostly full-time. Permanent positions	Only university core budget. Positions decided at the university and faculty level.	Very long (5-10 years)	Very high
Lecturers, post-docs and PhD students	Variable percentage. Medium to short-term (1-3 year contracts)	All sources. Positions are decided at the RU level (if funds are available).	Medium (1-3 years)	Medium-Low
External teachers	Ad hoc contracts related to specific courses. Mostly yearly.	University core budget	Short (yearly)	Low

Table 14. Types of staff of research units in Swiss communication sciences

This discussion demonstrates that RUs in our sample hire their staff from two very different human resources markets. The market for temporary positions – all staff except professors (and possibly some administrative staff) – is a very flexible and open market, where there is quite a large pool of individuals (positions in Swiss universities are usually open internationally) and RUs are largely autonomous in the hiring process; resources for these positions can be provided from all types of third-party funds, but also through the university core budget as related to educational activities. Accordingly, the level of criticality of these resources is rather low, as once resources are available, new staff can be hired easily.

In contrast, the professorial market has completely different characteristics: these positions represent long-term commitments at the university level and this implies a large degree of stability, but also of inflexibility – new professors cannot be hired quickly enough to respond to external demands, for example, large-scale contracts or launching new curricula. But at the same time, these resources are secured to the RU until retirement (most professorial positions in Swiss universities are permanent), independently from the level of output and acquisition of external resources.

Accordingly, we argue that RUs are following two different, but closely interconnected, strategies. The first is gaining faculty positions through recognition by their university and faculty; in Swiss universities – with their strong orientation towards scientific quality – this strategy is driven mainly by scientific credibility and, to a lesser extent, by educational needs. The time-window for allocation of faculty positions is medium to long-term, related to retirements as well as to the availability of new positions to be opened.

The outcome of this process endows the RU with a fixed stock of professors, both in terms of number and competencies, which constitute the critical resource for the short-term strategy of acquiring additional resources, through external contracts, funds from the Swiss National Science Foundation and additional university funds for educational activities; these funds can be invested quite flexibly in hiring temporary personnel in order to support professors in research and teaching activities. In this way, RUs can increase their level of credibility and reputation as well as their volume of teaching, thereby acquiring both future external resources and a better position from which to ask for additional faculty positions.

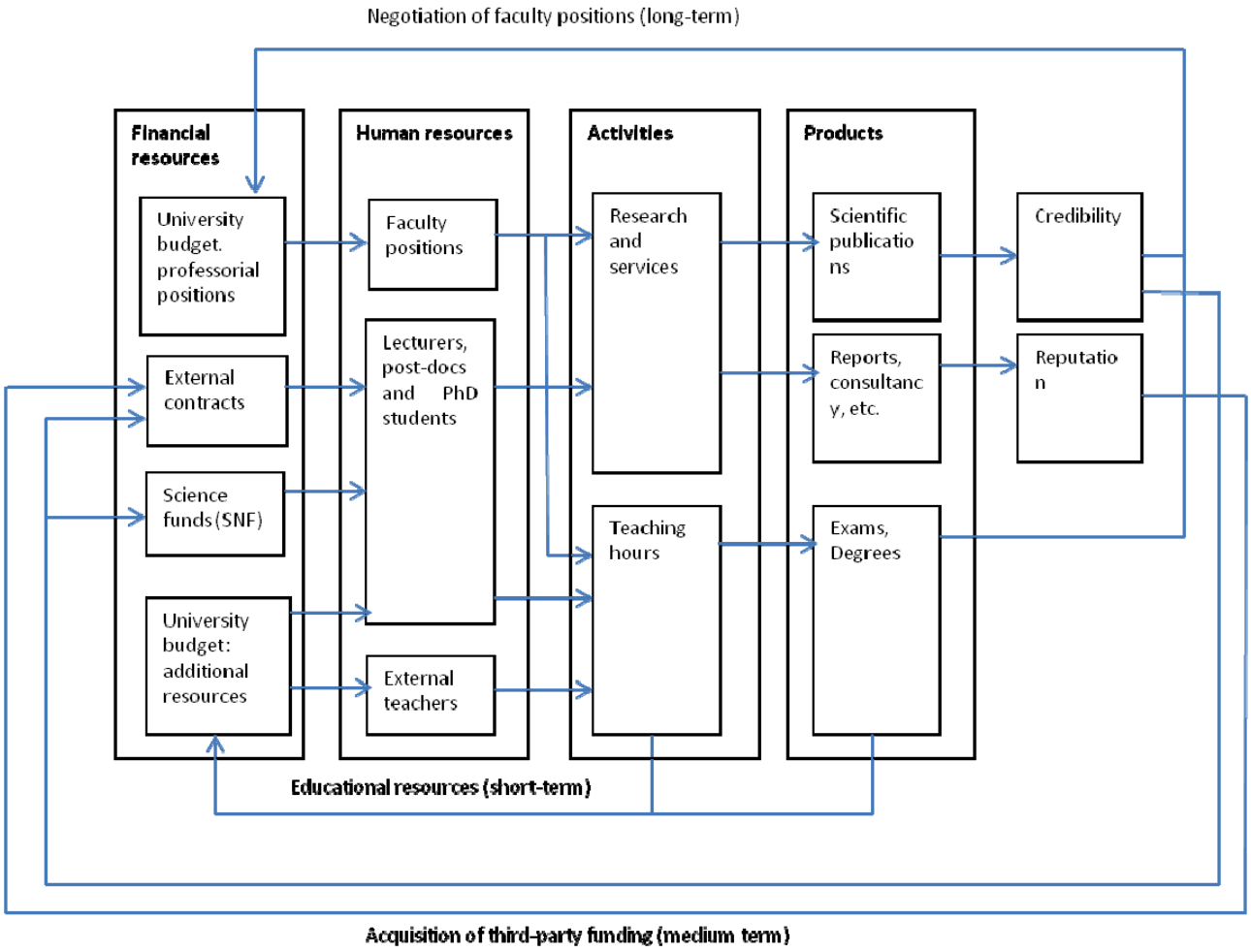

Figure 66. The resource acquisition cycles of the RUs in Swiss communication sciences

Therefore, we expect that RUs will try to strengthen their scientific credibility as far as possible from their available assets and environmental conditions. When acquiring external resources, RUs will give priority to SNF funding as it explicitly aims to support academic research and universities get additional core funding related to its acquisition (and thus RUs acquiring them benefit from higher reputation). However, as professors are supposed to both teach and carry out research in Swiss universities, RUs will also develop some level of educational activities. RUs in subfields where educational opportunities are limited might strive to strengthen their institutional position by acquiring external contracts and thus expanding their activities, but this pattern will depend heavily on the specific subfields as (unlike SNF funds) availability of contracts is quite variable by subdomain. Accordingly, a subprofile is expected to emerge with a stronger focus on external contracts rather than on education.

In addition, this strategy will not be available to RUs whose level of scientific credibility is too low – as related to the level of credibility of its faculty. Accordingly, this RU will have more limited access to science funds. We expect these units to expand strongly their volume of educational activities, as education can be an argument for requesting faculty position in the long-term. Acquisition of third-party funds is not an attractive strategy, as it does not provide additional reputation within the university per se, and if the scientific quality of the faculty is low it is unlikely it will allow the accumulation of additional scientific credibility (relative to the units in the first group).

5.4.1 Identifying groups of research units

The previous discussion, in addition the data presented in the first part of this chapter on resource acquisition, leads to the identification of four distinct groups of RUs in terms of their resource acquisition

strategies. As shown by Table 15, these groups also display rather different features in terms of their patterns of activity.

		Group 1	Group 2	Group 3	Group 4
N. of RUs		4	7	7	3
Personnel resources	FTE professors **	1.2	1.1	1.8	1.0
	FTE intermediary level	1.6	1.4	1.8	0.0
	FTE PhD students and assistants	4.4	4.2	2.7	1.2
Research training	PhD theses	1.4	2.1	0.4	0.3
	PhD students	10.3	8.8	5.0	6.9
Educational activities	BA theses	10.1	16.2	10.0	4.8
	BA hours taught	37.0	167.6	252.9	32.0
	BA hours organized	42.0	214.5	313.0	48.0
	MA theses	6.6	17.2	11.0	3.5
	MA hours taught	101.4	118.7	424.2	63.1
	MA hours organized	115.1	137.7	806.1	91.6
	further education theses	0.3	0.0	0.8	1.6
	further education hours taught	16.6	1.1	14.9	11.2
	further education hours organized	16.6	1.1	87.7	12.8
Scientific activities	funds public funding agencies	160438.7	249644.9	17655.9	22962.8
	academic awards	8.2	8.4	6.1	9.1
	total nr of publications 2009	12.9	15.7	7.3	28.9
Public transfer	funds public and non-profit org.	295932.3	44348.5	108762.4	19989.0
	public transfer total	16.1	15.0	13.5	10.1
Private transfer	funds private organizations	95813.7	31142.9	2146.1	5995.9
	private transfer total	6.9	3.7	2.0	5.8

Table 15. Indicators on activities

a) *Contract-based units*. Group 1 is composed of four RUs which have a high level of external contracts, both in absolute values – it includes 4 of the 6 units with the highest absolute level of external contracts – and normalized by the number of faculty members. The distinguishing feature is a low level of bachelor's education. A closer look shows that this group can be further divided in two subgroups: two RUs have a strong orientation towards public contracts, but at the same time are able to get a significant level of science funding, whereas the other two units have a strong focus on private funding and private transfer activities. What is noteworthy in this group is the rather high level of scientific activities, which is quite similar to that of group 2.

b) *Science-funding oriented units*. Group 2 is composed of RUs with below average levels of external contracts and above average science funds. It includes 6 units, all of them with educational activity below or around the average. The main difference with group 1 is that for these RUs external contracts are not a relevant source of resources. The data display a high internal homogeneity concerning the acquisition of science funding and generally low levels of activity concerning further education, public and private transfer.

c) *Education-oriented units*. Group 3 is composed of units with a low level of third-party funding – both from contracts and science; it gathers together the units in the sample with a high level of educational activity: the first five units in the whole sample for volume of educational activity are included in this group.

This group also contains the only unit which has high scores for external contracts and educational activity but which does not fit into the proposed classification. However, this RU is exceptional in terms of staff composition with 6.3 FTEs intermediary staff and only 1.1 PhD students; therefore we interpret the higher level of external contracts compared with other education-oriented units as due to this staff being active in getting external funding in order to finance their own working contracts.

d) *Low-activity units*. Group 4 includes three units having scores well below the average for all dimensions considered for classification purposes. Accordingly, what characterizes this group is the very low level of personnel resources. At the same time, there is no sign that these RUs are less productive scientifically than the rest of the sample and thus scientific credibility cannot be taken as an explanation for the observed pattern. A closer look displays that in two of the three units the head of unit was appointed during the year of observation; therefore, we consider that these units simply did not have time to develop their own profiles.

As Figure 67. Publications per faculty member 2005-2009, shows, there is a clear distinction between the two groups of RUs oriented towards the acquisition of third-party funding (groups 1 and 2) and the educational oriented RU (group 3) in terms of the past publication output of their professors. In contrast, the low-activity units in group 4 do not display any clear patterns concerning scientific credibility and this suggests that the low level of activity of these units is related to different factors. Looking at the most-productive individuals – those which are likely to provide scientific credibility – displays an even clearer pattern: 3 out 4 RUs in group 1 and 4 out of 7 RUs in group 2 include one individual with more than 50 publications in the period 2005-2009, against only 1 RU in group 3. Moreover, the RUs in group 3 include 7 out of 9 low-productivity professors.

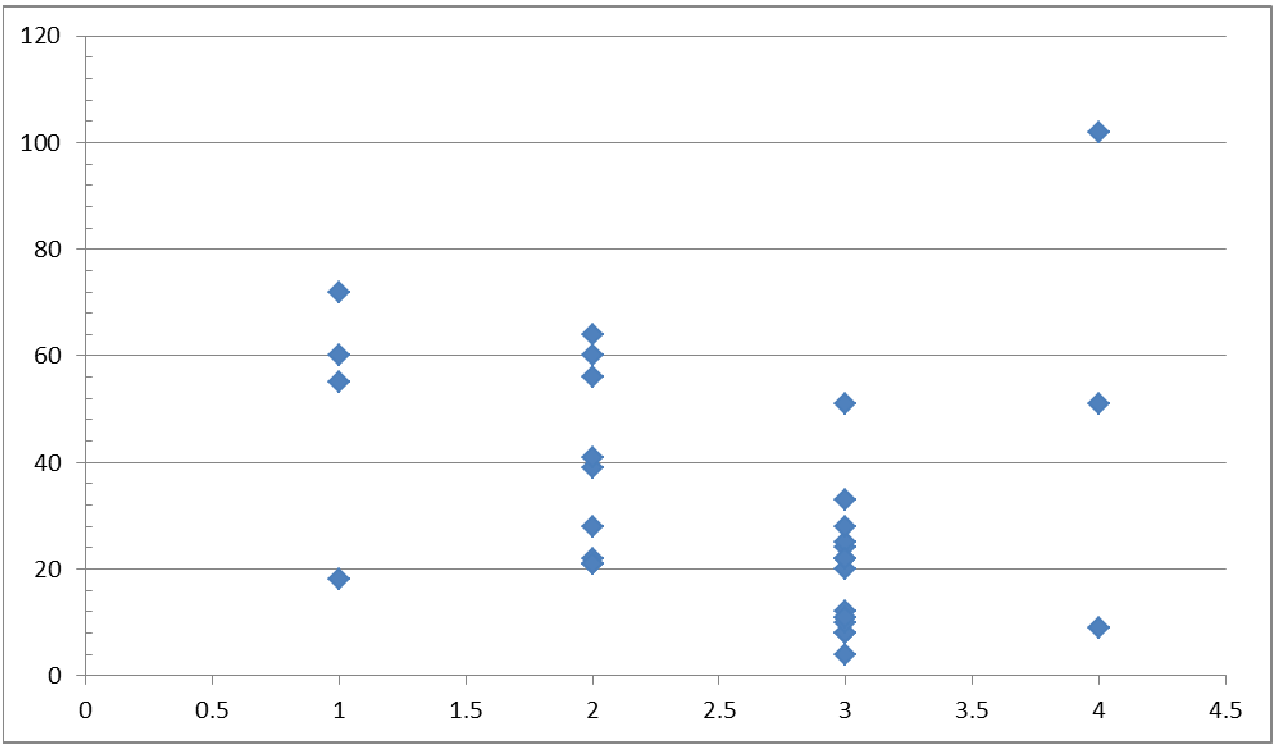

Figure 67. Publications per faculty member 2005-2009
Professors only.

The outcome of this discussion is that the selection of the profile of RU activities in communication sciences is largely driven by the scientific profile of the faculty concerned: RUs where professors have a high level of scientific production will focus on acquiring external funding – both from SNF and contracts – to expand their research production, whereas units whose faculty has relatively low scientific production will strive to expand their volume of educational activity, especially at the master's level where more opportunities are available. As we have shown that the scientific profile of intermediary staff is closely related to that of the relevant faculty, there are cumulative effects at work which tend to increase differences between these two groups of RUs. This result and the fact that professorial positions are long-term and the renewal rate is very low, imply that the selection of new professors – concerning their field, but also scientific profile and orientation – represents by far the most important choice in determining the future profile of an RU, with a lasting and long-term effect which can hardly be corrected through other measures (for example funding incentives).

6 Conclusions and perspectives

The previous analysis shows that our approach to the construction of profiles allows us to quantitatively produce profiles of research units in the field through the use of quite simple and easily available data, which could be collected, with a manageable effort, at the level of the RUs themselves. Moreover, the analysis of these profiles provides meaningful insights at the level of the whole field, and also concerning differentiation patterns of research units and their explaining mechanism. This focus on multifunctionality – where it is considered that differences in orientation between RUs are legitimate and contribute to the overall output of the field – matches the characteristics of Swiss communication sciences and was widely accepted by the representatives of the community.

In this final section, we deal with a few general issues which go beyond the specific scope of the project itself: these include the future scenarios of usage, further extensions including the possibility of applying the same approach to other scientific fields and, finally, the availability of the data at institutional level.

6.1 Scenarios for usage

The original objective of the Conference of Rectors of Swiss Universities in launching the B-05 program on "Measuring research performance" was to develop tools to measure the research performance of institutional units inside universities, adapted to the diversity of the Swiss university landscape and specifically addressing issues of measurement in social sciences and humanities.

As a matter of fact, within this broad setting, different possible uses emerged during the project, some of which have already been implemented, while others are envisaged in the near future. Clearly, the notion of profiles and the way they have been operationalized helped to produce this result, as it is a highly flexible construct which can be used for different purposes, from the level of research group to the university level.

The most concrete usage so far has been to produce individual RU reports, allowing heads of RUs to compare themselves with the whole field, to identify strengths and weaknesses and to serve as support for strategic decision-making. These reports include the indicators and the profile of the individual unit, as compared to the whole sample; this setting avoids any confidentiality problems, as each unit receives only the data on itself.

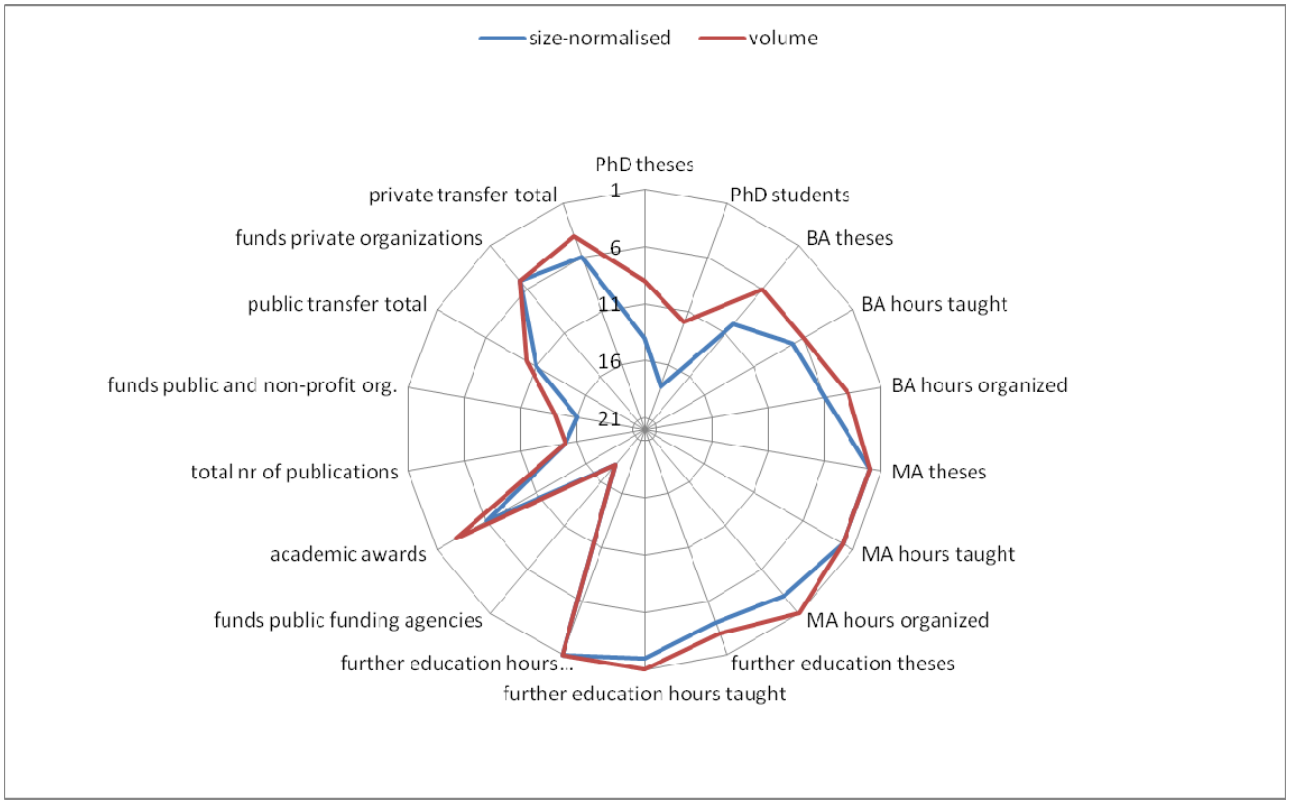

Figure 68. Ranking of individual RU (example)
1 = highest value in the indicator. N=22 (3 sub-units of RUs considered individually)

Figure 68 shows an example where, for all the indicators we developed, a research unit can identify its rank in the whole sample both concerning volume of activity and the indicators normalized by size. Accordingly, it allows the head of the unit to identify clearly its strengths and weaknesses as compared to the whole field.

The RU reports were generally very well received by RU heads; not only did members of the accompanying group state clearly that they are useful sources for their decision-making, but also many of the RUs involved in the study asked for a more detailed presentation of the results. While the overall appreciation of these reports largely matches that given by professors at the University of Fribourg who were not involved in the study (see box), the proof of the concept seems to have fostered more awareness of its utility and reduced fears that these reports would just display what is already known by peers.

The choice to compare RUs in the same field – rather than RUs in the same university and across fields – was very well received, as most heads of RUs would consider a comparison of units with similar characteristics to make more sense. However, it has been remarked that one should be attentive to the field delimitation and not compare RUs with very different orientations and missions (e.g. those in universities vs universities of applied sciences). Our approach has proved to be sensible enough to take into account these differences and to identify groups of RUs with similar profiles, and thus we consider that it could also be adopted in fields where there is large fragmentation and, for example, no overall shared definition of research quality.

Use of profiles – summary of interviews with professors at the University of Fribourg

In order to judge whether or not a profile such as the ones established in the present study would be considered useful in other fields, ten interviews were conducted with professors of other fields within the humanities and social sciences at the University of Fribourg.

The interviewed professors have differing views on the use of a profile for their unit. Some see numerous benefits whereas others consider the usefulness to be limited.

Those who are in favor of such a profile often mention that it would be interesting to have an objective representation of their activities. They see it as an orientation guide to help them identify strengths and weaknesses and see if these are the same as they perceive them to be. The profile can also serve as an objective basis for decision-making with regard to the further development of a research unit or even for new appointments.

One professor thinks that a profile might help him obtain further funds for his research. If the comparison to other units shows him to be among the best for, say, scientific output, he believes that this would be a strong argument for funding organizations to give him more money.

The professors who see no benefit in having their activities presented in the form of such a profile argue that they basically already know the results. They point out that each researcher compares himself and his unit to others. Due to collaboration among colleagues, conferences, databases and other sources one knows what colleagues and peers are doing. They considered their self-assessment to be fairly precise and do not expect a systematic comparison of research output to bring forward new insights.

The fact that a profile may encourage competition among research units by allowing them to locate their own and their competitors' positions is seen as an advantage by some, and a disadvantage by others. The latter are worried that if such profiles were used in evaluations, research units might work towards achieving the best possible results for the indicators concerned.

While it was stated clearly that the aim of study was to provide an instrument for the benefit of the research units, there are concerns about further use of the data. Some professors are worried that the units' activity profiles might not only serve as an orientation for the unit itself, but could also be used for evaluation purposes and therefore result in financial or other consequences.

The professors' willingness to have their performance represented by such a profile is mixed. The majority of professors consulted would be willing or even eager to have their performance portrayed by the method used in the present study, whereas others are skeptical and do not see any benefit. However, none of the interviewees categorically ruled out their participation in the event that such a study were to be carried out in their field. Although most interviewees criticized certain aspects of the model, the majority of them see more advantages than disadvantages in having their activities displayed by the method proposed. One professor says:

"On sait que c'est imparfait. On sait qu'il y aura toujours des éléments qui n'apparaîtront pas. Mais un peu d'objectivation, ça ne fait quand même pas de tort. Surtout dans les prises de décision."

A second application of the project is to produce an overall report on Swiss communication sciences, providing an overview of the field supported by comparable data, as well as gaining an insight into the diversity of RU profiles and orientations. To this purpose, the accompanying group allowed us to disclose data on individual RUs, but without identifying them by name. This usage not only has an informative function, but also a political aim, namely to consolidate the identity of the field by producing a common representation of it and to make its contribution to the Swiss research landscape more visibile. Defining common measures and benchmarks and representing all RUs on the same plot – despite differences among subfields and linguistic traditions – can be considered a decisive step in constructing the field and its boundaries. A clear wish to repeat the exercise in a few years was also expressed by representatives of the field, in order to assess the field dynamics. As such, the project can be seen as a way of setting standards for the analysis of scientific fields in social sciences and humanities at the national level, which goes beyond the largely descriptive approaches that have been used in the past towards a deeper understanding of internal differentiation processes.

A third potential usage is to provide a tool for management and internal decision-making processes inside universities. This would follow an general tendency in universities towards a more systematic use of performance evaluation for institutional management, strategic decision-making and allocation of resources. In this respect, the instrument which has been developed has the advantage of being attentive to the specificities of human and social sciences, by emphasizing the importance of multifunctionality, including all RU activities in the profiles and considering different types of publication output (e.g. book publications and publications in national languages). However, at least for large universities, we do not consider it to be realistic that this kind of data is collected for all institutional units, not even in social sciences and humanities. Moreover, the issue of how to construct the benchmark cannot easily be solved in such a large perimeter.

However, it would be conceivable to adopt this instrument for smaller sets of university units, for example individual departments or faculties, where the level of internal similarity is sufficient to allow for internal comparisons. Furthermore, even as far as providing a benchmarking to other units, the current format of RU reports could be adopted to a large extent in order to develop a standard for internal reports and, especially, to support peer-review evaluation processes.

In conclusion, the activity profiles developed in the present study would not be suitable for the management and steering purposes of a university, but they could be very fruitful in helping research units improve their activities (integrating the outcome of peer evaluations). Many Swiss universities have developed expertise with quality management activities and it could be seen as a good prerequisite for the management to include this instrument alongside others as a validated concept, which considers various productivity dimensions of a research field.

6.2 Future extentions: scientific quality and transferability to other fields

A major extension planned in the last phase of the project is to go beyond the current focus on volumes of activities by integrating some indicators of international visibility in the profiles. Visibility is a relevant criterion, as most of the bibliometric literature considers it as a measure of quality and hence uses indicators of visibility for this purpose. Once again, the solution we are proposing involves a combination of different points of view. The expert group agreed that a number of indicators are helpful to measure different dimensions of international visibility, including a more in-depth analysis of the composition of output types, developing a classification system of international, national and professional journals, based on a set of objective criteria, like the composition of the editorial board, authorship, language of publication (see De Filippo *et al*, 2010), and searching Google scholar for all the entries of the publication lists, looking for indexing and citations. The availability of publication lists is crucial to avoid problems of identification.

A pre-test of this approach displays profound differences in the publication behavior in the field, which make it impossible to use a single indicator on international visibility, but require an approach based on the

construction of multidimensional publication profiles. For instance, the data show the existence of two distinct publication cultures in Swiss communication sciences, where RUs focused on mass and political communication mostly publish in books and in national languages, while RUs focused on interpersonal communication mostly publish in journals using the English language. Moreover, a test with Google scholar showed that publications in the field do have their own visibility, even if it is difficult to ascertain where visibility comes from as Google scholar has no detailed documentation on the publication perimeter. Therefore, although international English databases like Web of Science and Scopus cannot be used in this field because the relevant publication medium are not covered (Lauf, 2005, De Filippo *et al*, 2010), other databases might be useful, even if careful work is required to better understand the relevant audiences.

Transferability of the approach to other fields in social sciences and humanities is a further item to be discussed. The general conceptual framework and identification of activity dimensions are built on a general understanding of the nature of research units and their activities and thus can be transferred to other fields. The same applies for some of the indicators (like numbers of PhD students, teaching hours, publication counts), but other indicators certainly need to be adapted in order to take into account some field-specific kind of activity or output (like consultancy in some fields) or dealing with field-specific characteristics of publication cultures. This applies especially to the analysis of publication output and to public and private transfer activities.

However, we must caution that the real issue about transferability relates to the identity of the field and to the possibility of constructing a shared space among the involved actors: as specified in the introduction to this report, indicators are social constructions which have scarcely any value if they are not accepted and endorsed by their users. Accordingly, the project was possible only because the whole field of communication sciences consented to participate through its scientific society and it was possible to agree and to legitimate project choices with a representative accompanying group. In fields where there is no such shared culture – for example, if there is clear-cut division between subgroups or types of institutions – this will hardly be possible.

6.3 Issues of data collection

Every quantitative measurement is based on data which has to be collected. This process can be very time-consuming and also sometimes stressful. In the present study, data collection proved to be time-consuming, both for the researchers doing the study and for the participants. To some extent there is undoubtedly a learning curve in constructing definitions and developing data collection, management and analysis routines, meaning that the effort required to repeat the exercise would be much lower than in the first phase. However, collecting data from RUs themselves or even from individual researchers is necessarily time-consuming and complex. The question arises whether certain information could be collected by using databases which exist in the universities.

In most universities, the following data should be included in a central university database and thus could be extracted centrally:

- Background information: The names and the function of the employees of a research unit as well as their employment rate are available in personnel management tools.
- Research training: The number of doctoral theses (diplomas) as well as the number of doctoral students should be available at central or faculty level.
- Scientific output: Most Swiss universities have publications databases, but there are still many limitations related to their coverage and how these are coded, which might strongly limit the possibility of use for evaluation purposes (Reale *et al*, 2011). This includes, for example, issues of attribution to research units and coding of publication categories.
- Funds for research: Funds obtained from the Swiss National Science Foundation and other public funding agencies are in general contained in financial databases. It must be checked whether this is the case for all funds from public and private organizations.

- Teaching: Bachelor's and Master's theses or diplomas are usually covered, while the number of teaching hours is not necessarily available. Further education is more heterogeneous and its coverage is more difficult.

The experience of the project, particularly at the Universities of Fribourg and Lugano, showed that starting from centrally available data can substantially reduce the burden for data collection. This would be even more important if extending the approach to larger fields. However, the following problems emerged as limiting factors for the use of these data:

- Firstly, the definition of a research unit adopted in this project is a functional one and does not necessarily match the administrative structure upon which central databases are usually built. Issues of careful identification of relevant units and their delimitation need to be addressed here; if the structures are too different, centrally-available data will be barely usable.
- Secondly, attribution is a fundamental problem which is not easily solved. This is the case especially if individual people are active in more than one research unit or if responsibilities for research and education are clearly separated. Many such cases had to be solved manually in this project, but development of standard attribution rules would be required for a broader application.
- Thirdly, until now institutional databases have been used mainly for producing aggregated statistics at the institutional level rather than for internal management and evaluation; disaggregating data at a lower level imposes much higher requirements in terms of data quality and validation than with their current use.

Our conclusions in this respect are as follows. Firstly, there is potential for the use of data from institutional databases and it will be essential to exploit this potential if the approach proposed in this project should be extended to broader fields and become regularly integrated in evaluation processes. Secondly, this requires a fundamental revision of most institutional databases to address issues of data quality, attribution and validation; the development of common standards between Swiss universities would be vital in this respect and here we identify a central domain for future activities inside the "Measuring performance" CRUS project.

Thirdly, the data in the university databases need to be checked in any case by the head of unit for accuracy and in order to take into account any specificities and to achieve acceptance by the heads of units. Finally, there will always be some data which need to be collected through surveying the members of the research units, like most scientific awards and transfer activities, as well as information on mobility.

In conclusion, there will always be a part of the data which has to be collected manually, either because it is qualitative or because it is too specific. Even the most complete university databases will not contain all information needed; there will always be work to be done by the research unit. However, if some of the data can be provided by the central service for statistics, data collection could be done more efficiently and hence more willingly.

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