

**A Bibliometric Model for
Performance-based Budgeting of Research Institutions**

Recommendation from the committee
appointed by the Norwegian Association of Higher Education Institutions
on assignment from the Ministry of Education and Research

Table of Contents

1.5 Summary and recommendations	3
2 New registration system for academic publishing	9
3 Definition of academic publishing	11
3.1 Background	11
3.2 Definition	12
3.3 Comments.....	12
3.4 Use of the definition.....	13
4 Academic publication channels.....	14
4.1 Definition	14
4.2 Special considerations in the humanities and social sciences	14
4.3 Register of academic publication channels	18
4.4 Authorship.....	21
4.5 Quality level (classification in the budget model).....	23
5 Two-tiered classification of publication channels.....	25
5.1 Discussion	25
5.2 Two levels	27
5.3 Differences among academic fields.....	28
5.4 Publication patterns in three academic field groups	29
5.5 Guidelines for nomination.....	31
5.6 Potential impact on publishing practices	35
5.7 Results of the nomination process autumn 2004.....	37
6 Academic publication types	38
6.1 Definition	38
6.2 Three academic publication types	38
6.3 Literature reviews and academic book reviews.....	39
7 Weighting of publication types and publication channels	41
7.1 Discussion	41
7.2 Publication types and differences among academic fields.....	42
7.3 Recommendation for weighting of publication types and levels	43
7.4 Field factors?	44
8 Authors and institutional affiliation.....	46
8.1 Discussion	46
8.2 Institutional affiliation based on the publication	47
8.3 Apportionment of publications when several institutions cooperate.....	48
8.4 Weighting of institutional or international cooperation?	49
8.5 Challenges to the documentation systems.....	49
9 Statistics and point calculation.....	50
9.1 Discussion	50
9.2 Funding for publications	50
9.3 Lack of simulation data.....	51

1.5 Summary and recommendations

The Norwegian documentation system for research funding was approved by the Ministry of Education and Research in 2005 upon the recommendation of the Norwegian Association of Higher Education Institutions (UHR). First used in connection with budget allocations in 2006, the system is designed to facilitate a performance-based distribution of research funding to the institutions based on their academic publishing activity.

The Ministry's objective for this project has been to develop a qualitatively better, more reliable system of documenting academic publishing that will serve as the basis for the research component of the budgets for universities and university colleges. The purpose is to create a performance-based funding model for research and to encourage more research activity at universities and university colleges. The documentation system must also be flexible so that it can be used for other reporting needs and in individual and institutional publication lists, applications, project reports and evaluations, annual reports and information for the public at large.

The project's main results are presented in the form of recommendations from the Academic Committee and the Technical Committee. These recommendations include parameters for the registration and classification of academic publications and an explanation of the design of the new documentation system.

Recommendations from the Academic Committee

An *academic publication* is defined according to four criteria; all four of these must be satisfied.

- which publication channels and publication types are regarded as academic;
- whether a publication may be regarded as academic if it has not been published in a registered academic publication channel (self-reporting);
- which bibliographic data sources are relevant for the documentation system and which publication channels are to be included in the data source;
- fundamental questions related to the parameters for and classification of academic publications.

The Academic Committee recommends that the publication channels be classified according to whether their authorship is local, national or international in nature. Authorship has been given the following operational definition:

- Authorship is *local* when more than two-thirds of the authors published in the channel are from the same institution.
- Authorship is *national* when more than two-thirds of the authors published in the channel are from the same country.

- Authorship is *international* when less than two-thirds of the authors published in the channel are from the same country and the channel uses an international language.

As a general rule, publications in publication channels with local authorship are not to be included in the statistics on academic publishing reported to the Database for Statistics on Higher Education (DBH), and which would therefore be included in the Ministry's basis for setting the research component of the budgets.

To ensure that the funding model has a positive influence on the publication patterns in the various academic fields, the committee recommends that the publication channels be divided into two levels. As a starting point, *Level 1* includes all publications that may be defined as academic. In practice, the content of this level is defined on a continual basis by means of an updated register of academic publication channels.

On the basis of Level 1, certain publication channels are selected for a list representing *Level 2*. This list, which relates to a specific budget model, is updated annually through an academic approval process. According to recommendations made in this project, the publication channels nominated for Level 2 must:

- be perceived as the leading publication channels in a wide variety of academic contexts;
- publish the most outstanding works by researchers from different countries.

The Academic Committee recommends that the journals and the academic fields they represent be divided into *three academic field groups* that reflect different publication patterns. (These three groups do not correspond exactly with the usual division of academic departments in the higher education sector.) When publication channels are nominated for Level 2, different sets of guidelines are applied depending on which academic field group they belong to.

The differences between the three groups can be summarised as follows:

- In Academic Field Group A, the list compiled by the Institute for Scientific Information (ISI) is used as a basis. Level 2 cannot be expanded by adding more journals, but proposals to *replace* one journal with another will be considered.
- In Academic Field Groups B and C, supplements/replacements may be approved according to the criteria for the *international level* as described above.
- Academic Field Group B is subject to a more stringent criterion for conference publishing than is Academic Field Group C. In Group B conference reports must be published in an academically edited series, while in Group C publication by an academic book publisher is sufficient.

- In Academic Field Group C, it is possible to nominate *Scandinavian* publication channels that use a language regarded as international within the specific field. (This is not possible for the other groups.) However, the general rule giving priority to publication channels that are leaders in a wide variety of academic contexts will still apply.

On the basis of the ISBN or ISSN and the definition of an academic publication, the publications will be classified into three main types:

- *Academic monograph*: The publication has a title with an ISBN. It may have one or more authors, and the names are listed in connection with the title.
- *Academic article in an anthology*: The publication does not have its own number, but it is associated with a title that has an ISBN. It may have one or more authors, and the names are listed in connection with each publication.
- *Academic article in a periodical or series*: The publication does not have its own number, but it is associated with a title that has an ISSN. It may have one or more authors, and the names are listed in connection with each publication.

A publication will be credited to the institution(s) that the author(s) list in the publication as the author address or institutional affiliation. If an author decides to list two or more institutions in his or her publication, the publication will be divided equally among the institutions. After thorough discussion, the committee has decided to recommend that international cooperation not be weighted more heavily in the registration process. An incentive of this nature could be implemented when the results are calculated.

All authors and addresses listed in a publication will be given equal weight. The Academic Committee recommends that consideration also be given to the number of authors affiliated with each institution. The calculation is thus based on the number of authors of the publication according to the following formula:

- A publication with 1 author is worth 1 point.
- A publication with n authors is worth $1/n$ point for each author, but the value must be at least $1/10$ point. (Fractions are not used when there are more than 10 authors.)
- An institution is granted the sum of the point values from those authors who credit the institution.

The publication types are weighted differently among the types and between Levels 1 and 2. This formula for weighting forms the basis of the point calculation used for statistics in DBH:

Table 2 - Recommended weighting of publication types for the two levels of publication channels.

Publication type	Level 1	Level 2
Monograph	5	8
Article in periodical or series	1	3*
Article in anthology	0.7	1

* A weight of 5 was proposed in the original report, but this was changed to 3 when the model was implemented.

Findings and recommendations from the Technical Committee

The Technical Committee recommends that a support system be established for the existing documentation systems FRIDA and ForskDok to facilitate the import of bibliographic data and processing of the authority registers.

- The Technical Committee has designed a system referred to as the Import Service and Authority Registers (ISAR).
- This system, developed by the subcontractor USIT, has been designed so that a call for tenders can be issued for the permanent operation of the system.

Three authority registers have been developed for use in ISAR and the local documentation systems:

- Academic publication channels
- Publication types
- Institutions

The authority registers of publication channels and publication types have been developed in cooperation with the Academic Committee. The register of academic publication channels, which is standardised according to the alternatives in the documentation system, contains information on the standardised name and number (ISSN, ISBN), quality level and authorship of 13,869 academic periodicals and series and 450 publishers. The register of publication types ensures that the alternatives in the documentation system have been standardised according to the three academic publication types identified by the Academic Committee: *monograph*, *article in an anthology*, and *article in a periodical or series*. The institution register is based on the Common Student Register (CSR). The CSR will serve as the authority register and be expanded on a continual basis as new institutions enter the system.

ISAR is based on data imported from three bibliographic data sources.

- ISI
- Norart
- BIBSYS

The ISI databases encompass over 9,000 journals. ISI indexes all articles on a continual basis as the journals are published. The article references are added to the publication types, and all author addresses are registered as they appear in the journals.

Norart (Norwegian and Nordic index to periodical articles) is a journal index at the National Library of Norway. As of 2003 Norart encompassed about 60 of the journals defined by this project as academic. To achieve better coverage of bibliographic data sources from academic journals, Norart was expanded in 2004 to include 68 Norwegian and Scandinavian journals. These journals are indexed according to the standard routine used by Norart, but the publication type and institutional affiliation are registered as well.

The BIBSYS library database is a data source that compiles basic data on academic book publishing. The libraries at the higher education institutions register all documents that they acquire for their collections in BIBSYS using a high-quality bibliographic description. The institutional affiliation and publication type must also be added to the description.

Certain academic publications must be “controlled” to determine the publication type. Consequently, for each post in ISAR different methods are used to determine the publication type depending on the source of the post, which may be the bibliographic data sources or self-reporting.

After new registration routines have been introduced, the institutions’ documentation systems will require a new support service (System Support Service) for the permanent phase of operation. The System Support Service will develop and permanently maintain the new functions (and systems) that will support the registration of academic publications. Specifically, the System Support Service will:

- maintain and update the authority files for the academic publication channels (periodicals, series, websites and book publishers);
- acquire and distribute references from the institutions’ bibliographic data sources.

The Technical Committee recommends that the System Support Service be implemented as a pilot project during the first year of operation. As soon as possible a project director should be hired who will be responsible for implementing the project and purchasing the necessary IT and library services, as well as statistical/bibliometric services if necessary.

Before the new documentation system is implemented, adaptations must be made to the local documentation systems. Among other things, a module must be developed that imports publication data from ISAR with the relevant data for an institution. Also in this module, reports must be produced that list publications which do not credit any researchers at the institutions. Every year in February data is delivered from the research documentation

systems to DBH (for use in the funding model). The only publications reported are those linked to persons with some type of affiliation with an organisational unit at an institution.

The Norwegian Ministry of Education and Research is responsible for issuing specifications for the data to be delivered to DBH. The institutions are responsible for delivering data of satisfactory quality to DBH, and will compile the data used in the reporting of academic publications from the documentation systems they use. Routines must therefore be established in these systems for reporting to DBH. Data from relevant authority files will be transferred directly from ISAR to DBH.

In 2004 reporting will be limited to data that is directly relevant to the Ministry's budgeting process. Data will be reported at the departmental level (the level at which the research is conducted) and will form the basis for calculating publication points at the institutional level based on the quality level, publication type and weighted publication figures. The institutions will count the number of publications for the specific departments/divisions (reporting units), as well as the number of authors at the unit and the total, classified according to publication channel, (book publisher, series or journal) and publication type (article in a periodical or series, article in an anthology, or monograph). The figures from DBH will be incorporated into the ordinary annual budget report to the Ministry, along with figures for students, employees, etc. Institutions not connected to ForskDok or FRIDA will receive information and access to the authority registers and bibliographic data directly from the System Support Service. On the basis of these data, the institutions will report directly to DBH.

2 New registration system for academic publishing

While many documents already registered in the research documentation may be described as recommendations, reports and committee reports, the project in 2004 has been a *development initiative* in which changes in the documentation systems have been prepared and implemented in the sector during the development process. This has required an all-out effort. Decisions could not be postponed. Consensus had to be reached while the work was being carried out. All parties involved – i.e. a large number of participants from a variety of institutions, including the national academic councils – have worked intensely on this project throughout the year using a detailed plan prepared by UHR that included projects, sub-projects and milestones. Delays have naturally occurred. Many project participants have been mutually dependent on each other in the process, and sometimes they have been dependent on sub-contractors and agreements outside the higher education sector. In spite of these delays, this report nonetheless contains findings that the Ministry can directly put to use, if the findings are deemed to be satisfactory, and this report has already been followed up with changes to FRIDA and Forskdok, the two documentation systems used for academic publications by most of the institutions.

An apparently small change in the documentation systems has resulted in an enormous work load for this project in 2004. However, this is only a one-time event – in the future only maintenance will be required. Academic publications will no longer be registered on lists classified by category, but will be assigned an ordinary bibliographic reference in which the most important information elements have been standardised. In most cases, it will not be necessary to enter the entire reference because the documentation system will have imported it from a bibliographic data source. For instance, the reference for an article in the journal *Historisk tidsskrift* will be registered with the standardised name and ISSN, but this information is already found in the documentation system's authority register of academic publication channels. In addition, references for articles published in this journal will be imported from the documentation system from the article index Norart at the National Library of Norway, which means that the author (or an assistant) only needs to verify the reference and correct it if necessary. The advantages of using ordinary bibliographic references standardised in relation to the authority registers include:

- a lighter work load for the person entering the register data. In principle, only one person at the institution will need to register all of the employees' publications, if so desired, and he or she need not *assess* which category a publication belongs to.
- a common, open set of parameters that defines academic publishing for the entire sector. These parameters are incorporated in the authority registers. Everyone has access to these registers and may propose additions or corrections.
- a well-organised bibliography for the entire institution that can be used in many different contexts and sorted in different ways for various purposes: individual

publication lists, joint annual reports or project reports, applications, websites, full-text publications available from the institution's portal – and documentation for the Ministry.

- access to statistics that will provide a simple, recognisable overview of the publication arenas used by the researchers in a particular academic field or at a specific institution.
- objective publication data which are as comprehensive as possible and comparable for all higher education institutions. Norway will be the first country in the world to have such a system.

The transition to the new system is now being implemented in FRIDA and Forskdok. Those institutions not affiliated with FRIDA or Forskdok have been given well-defined criteria and tools with which to work, but it is unlikely that the transition will be problem free. It would not be uncommon to experience the transitional problems that typically arise when electronic information systems are re-designed and many different data suppliers are involved.

While these technical transitional problems are being addressed, there will probably be discussions about and proposals for improvements to this report's recommendations on the parameters, classification and weighting of academic publications for use in performance-based funding of research at the institutions. Also, this part of the project has involved highly complex issues, which the discussions will surely bring to light. In connection with these discussions, we can look forward to gaining better statistical insight into where and how academic works produced in the sector are actually published – as a result of the *new registration system for academic publishing*.

3 Definition of academic publishing

3.1 Background

This chapter presents a definition of academic publishing developed for the purpose of measuring academic production for use in budget models. The objective is therefore to measure previous research activity in a manner that provides opportunities for and encourages further research. Consequently, the definition should not be too broad, but should be targeted toward the particular activity that the funding is intended to support. In addition to research and teaching, dissemination of research findings is the third main objective of universities and university colleges. In this connection, the Ministry has launched a project at UHR to look more closely at the possibility of documenting dissemination as the basis for targeted funding of this activity. The definition of academic publishing presented in this chapter is not intended to encompass dissemination.

The definition includes academic fields, research fields and institutions that rely on academic publishing as their most important means of presenting research findings. Despite this common denominator, publication patterns vary widely, especially among academic fields. It would not have been possible to incorporate such variety into a common definition if the definition had also encompassed forms of results that were similar to, but not the same as, academic publishing. For some academic fields and higher education institutions, however, this definition is not particularly relevant for their activities. Although some academic publishing does occur, it is not the most important form of results. The Ministry has already taken this into account. Proposition No. 1 (2004-2005) to the Storting states that the Ministry “will not use the publishing indicator for the Norwegian Academy of Music or the Oslo School of Architecture and Design, nor for certain private institutions that receive government funding. Neither will the publishing indicator be used for the government-funded art colleges”. It may also be necessary to look more closely at institutions that conduct activities involving museums, collections, lexicography, edition philology or other activities that produce a limited amount of academic publishing if these activities are extensive enough to be significant for budget apportionment at the institutional level.

The definition presented here has been discussed and modified several times. It was first addressed by the Publishing Committee at the University of Oslo (UiO) in connection with the recommendation *Forskning med tellekanter* (“Research that counts”, UiO, 2003), then by the recommendation *Dokumentasjon av vitenskapelige publikasjoner* (“Documentation of academic publications”, 2003) and the report *Bibliografiske datakilder* (“Bibliographic data sources”, 2003). These were followed by input from the Research Committee at UHR in connection with the launching of this project and finally by the Academic Committee within the framework of this project.

3.2 Definition

An *academic publication* is defined according to four criteria; all four of these must be satisfied. The publication must: The publication must:

1. present new insight;
2. be presented in a form that allows the research findings to be verified and/or used in new research activity;
3. be written in a language and have a distribution that make the publication accessible to most interested researchers;
4. appear in a publication channel (journal, series, book publisher, website) that has routines for external peer review.

3.3 Comments

The Academic Committee will comment first on the definition in general and then on each point in particular:

- The definition has been a focal point for the work of the Academic Committee. In particular, it has served as the basis for establishing other parameters, classifications and definitions. The Academic Committee recommends that all discussions of the documentation and funding system be based on this definition.
- Research activity may produce results in forms other than academic publications. In other words, academic publishing is not a definition of research.
- Different academic fields, research fields and institutions may produce different volumes of academic publications depending on their societal roles and publishing traditions. These differences can be levelled out in budget models if so desired, but this must not be achieved by changing the definition.
- The definition has been formulated to allow for different, reasonable interpretations based on the publishing traditions in the various academic fields. For instance, while the formal requirements for an academic article will vary according to the academic field, the definition is intended to encompass the formal requirements used in all academic fields.

The Academic Committee has the following comments to the specific points in the definition:

- The concept of new insight should correspond with the usual requirements for originality in the specific academic field as it applies to new publications in relation to publications which already exist.
- The criterion for verifiability is not equally relevant in all academic fields. For those fields in which this criterion is less relevant, the concept of usability will mean that the publication must be formulated so that other researchers can evaluate and possibly build further on the publication's results.

- Note that in certain academic fields and subject areas, a publication may be written in Norwegian and still be accessible to most interested researchers. In many fields and subjects English is just one of several international languages. As regards distribution to a targeted group of researchers, this also applies to future researchers who may find and access the publication through library services.
- The concept of external peer review refers to various forms of editorial routines which vary among academic fields and publication channels and which indicate that the manuscript has been evaluated by one or more independent experts on the author's topic. These routines may be organised differently in various academic fields and publication channels. The same is true for routines for obtaining statements from experts in relevant academic fields at the academic publishing houses.

3.4 Use of the definition

It is estimated that employees in the higher education sector in Norway publish at least 8,000 academic publications annually. Of course, each publication cannot be assessed on the basis of the definition presented above. In the documentation system the parameters for academic publications will be established in practice by the parameters for academic *publication channels* and *publication types*. These two concepts will be presented later in separate chapters. The definition of academic publishing may be used as a basis for determining:

- which publication channels and publication types are regarded as academic
- which bibliographic data sources are relevant for the documentation system and which publication channels are to be included in the data source
- fundamental questions related to the parameters for and classification of academic publications

4 Academic publication channels

4.1 Definition

Academic publication channels are periodicals, series, websites and book publishers with an editorial structure designed to publish academic publications as defined in section 3.2 (i.e. original research findings presented in an academic form and distributed to most interested researchers following quality assurance by external peer review).

Websites are regarded as academic publication channels when they have an ISSN and assign the articles unique identification numbers corresponding to the volume and page number. They must have an academic editorial unit that arranges for external peer review, and they must clearly identify those articles which are academic. As regards electronic publishing, websites for pre-prints have become an important form of communication between researchers, facilitating quick access to new research findings. According to the definition, such publications may only be registered as academic when the publishing process has been completed, and they have been linked to an ISSN title that has undergone external peer review. Also according to the definition, the same publication cannot be registered as a *new* publication if it has been published in a series for reprints or in an electronic archive at the institutions.

All academic publication channels with an ISSN (i.e. periodicals, series and websites) must have an academic editorial unit. It is the editorial unit affiliated with the ISSN title that is regarded as the publication channel, not the publisher of the ISSN title. In other words, it does not matter whether the ISSN title has been published by a research institution or a commercial publishing house. Publishers are only regarded as a publication channel in connection with independent book publications, i.e. ISBN titles (monographs and anthologies) not linked to an ISSN title. In order to publish an ISBN title, regardless of country, an application must be submitted for a publisher identification code (i.e. the digits before the second hyphen in an ISBN). These codes are assigned to publishing houses, institutions, organisations and private individuals. For the purposes of this project, it is not necessary to distinguish between, for example, a research institution and a commercial publishing house. As the criterion specifies, a publisher is academic if it has an editorial structure designed to publish academic publications as defined in section 3.2. If there is a need to classify the publication channels even further, this will be achieved by applying the definition of authorship and quality level; see sections 4.4 and 4.5 below.

4.2 Special considerations in the humanities and social sciences

In the humanities and social sciences the distinction between academic and other types of publication channels can be difficult to determine. The Academic Committee deliberated this

issue in a sub-committee, and a small-scale survey was conducted of Norwegian publishing houses that publish works by researchers at the educational institutions.

The Academic Committee has found that the Norwegian or Nordic context poses the greatest problem regarding the definition of academic. Outside the Nordic region researchers are usually the target group for the works published, and the publication channels are most often academic. In contrast, the book publishers and journals in Norway and the Nordic region are primarily responsible for the production of teaching material and the dissemination of information on the arts, culture and society that is generated by the research community. The Academic Committee has also mitigated this problem by deciding that local publication channels, i.e. publication channels that primarily disseminate works by authors from the same institution, are not to be included in the statistics submitted to DBH (see section 4.4 below). The problem area is thus the book publishers and journals in Norway and the Nordic region that publish works by researchers from several different institutions and when there is doubt as to whether these book publishers and journals may be regarded as academic publication channels. This reduces the problem to a manageable number of book publishers and journals, at least from the perspective of the individual academic field. In the following discussion, a distinction is made between academic journals, cultural journals and book publishers.

Professional journals are targeted toward members of certain professions or sectors of society. A few examples of Norwegian professional journals are *Plan, Rus & avhengighet, Juristkontakt, Ingeniørnytt, Forskerforum, Norsk læreren* and *Tidsskrift for Den norske lægeforening*. The last mentioned, in addition to being a professional journal, is a clear example of an academic journal because original articles that have undergone external peer review are published in a *separate section* of the journal, which has its own external editorial unit. In the opinion of the Academic Committee, professional journals that deem it expedient, based on their editorial profile and objective, to publish a separate section with original articles that have undergone external peer review may be regarded as academic publication channels when an editorial scheme of this type is in place.

As regards *cultural journals*, the following quotation is taken from the website of Arts Council Norway:

Arts Council Norway defines a cultural journal as one which aims to reach the general public with information about and reflections on cultural and social issues or which offers presentation and analysis of the various art forms and the protection of cultural heritage. Arts Council Norway exercises its discretion to assess which journals are eligible for funding, but will give priority to journals that present a diversity of subjects and topics in a high quality, easily understood manner.

Arts Council Norway does not provide funding for “professional journals and other journals targeted toward a specific group of readers”. In contrast, journals of this type are eligible for funding from the Research Council of Norway, as explained in this quotation from the Research Council’s website:

In order for an academic journal to be eligible for funding, the journal must have established a scheme for external peer review (referees). A funding application for journals and academic annuals that have not received funding in recent years must include a statement of objectives, writer's guidelines, information about the editor(s) including academic degree and position, editorial board if relevant, referee scheme and institutional affiliation.

In general, the Academic Committee believes that the parameters should be set so that journals eligible for funding from the Research Council of Norway could be included in the definition of academic while this would normally not be the case for journals eligible for funding from Arts Council Norway. This means, for example, that *Vinduet* (a journal containing works of fiction) would not be included, but *Norsk litteraturvitenskapelig tidsskrift* (a journal of literary analysis and literary theory) could be included. Discretion must nonetheless be exercised to ensure the inclusion of general interest journals that have an academic editorial routine and publish original academic articles. With some uncertainty, therefore, *Kirke og kultur* (a cultural journal with articles on cultural and social issues, literature and ethics) and *Nytt norsk tidsskrift* (a cross-disciplinary journal with perspectives on politics, culture, literature and science) could be included, but *Samtiden* (Norway's largest and oldest general interest cultural journal) and *Syn & Segn* (a journal addressing political, cultural and social issues in Nynorsk) could not be included because they apply a different set of criteria to submitted articles. All four journals would satisfy the eligibility requirements for funding from Arts Council Norway. The last two journals would probably not satisfy comparable requirements at the Research Council of Norway, whereas the first two would probably lie in a grey area. By including these two journals among the academic publication channels, the Academic Committee is indicating where it believes the boundary should be drawn. In academic fields that primarily publish research findings in journals, the definition of an academic publication may be seen to be too broadly interpreted. In response, it should be pointed out that academic publishing norms in the humanities and social sciences were taken into account when the parameters were set. Moreover, the number of articles from the higher education sector found in the grey area between cultural journals and academic journals is rather small, and the market is quite limited for both types of journals at a Norwegian or Nordic level. These journals are often dependent on government funding – thus the relevance of the two funding schemes mentioned above – and this fact alone limits the number of journals in question.

Among *book publishers* at the international level, academic publishing represents its own area of editorial specialisation and its own book market (i.e. research institutions). In small language environments such as in Norway and the Nordic region, this area of specialisation is less visible, and the economic base for the publication of academic titles is rather limited. Usually these titles are part of a publishing programme at the publishing houses that also includes textbooks and books for the general market. The books for larger target groups may be written by the same authors who produce the academic titles. Additionally, in some academic fields which have a large number of students or which represent large professional

groups outside the higher education sector, academic titles may have a substantial readership outside the research community. As a result, the publications often appear in a form that makes it difficult to distinguish between the presentation of research findings and the dissemination of academic material without closer analysis of the content. These are some of the factors that make it difficult or seem artificial to draw a line down the middle of Norwegian and Nordic publishers and to decide that some are academic publications channels while others are not. In addition to the problem of making such an assessment, competition within the publishing industry could be distorted when boundaries are drawn, but this problem should probably not be exaggerated since it mostly involves titles with a weak economic base that are dependent on government funding.

As part of this project, a survey was conducted by e-mail of Norwegian book publishers that are potential publication channels for researchers in the higher education sector. The questionnaire was introduced with a quotation from the information on academic publication channels found on UHR's website:

Academic publishers may be publishing houses, research institutions or researcher associations with a professionally organised publishing programme that ensures good quality of the academic publications. Some publishing houses specialise in academic publishing while others engage in this activity as part of a broader publishing programme. An academic publishing programme will usually have a national (not local) authorship at a minimum, and quality should be ensured by obtaining independent expert opinions from peers. This may be handled at both the publishing house and at the research institution or researcher association. In the last mentioned case, the publishing programme may or may not have a publishing house that serves as the distributor.

It is important to note that popular scientific books, current affairs books for the general public and textbooks written by researchers are not included in an academic publishing programme.

- *Based on your own assessment, do you have an academic publishing programme that falls within the definition given above?*

If not, skip the next two questions.

- *Explain how the quality of the academic publications is ensured and maintained.*
- *Do the academic publications receive financial support, and if so, how and from what sources?*

The answers showed a rather clear distinction between publishers. Many answered yes to the first question and could provide an explanation for the last two questions in a fairly detailed manner, showing an obvious interest in this type of publishing. Others gave a clear no, while two publishers answered that they focus on disseminating academic material in the form of popular science or books written for the general public. Overall, the survey showed that a particular group of publishers in Norway focus on book publications according to the committee's definition while others do not. Some have placed their academic publishing programme in a separate editorial unit, and others have established their own publishing unit

(e.g. the Norwegian publishing houses *Gyldendal Akademisk* and *Cappelen Akademisk Forlag*).

The survey also showed that the government funding schemes for academic publishing are crucial. The main funding scheme is administered by the Research Council of Norway. This scheme employs clear criteria and external peer review at a national level, but because the scheme has a limited financial framework, the institutions themselves also provide funding for their own researchers' books. In these cases, it may be difficult to determine if funding or peer review and research quality is the decisive factor for whether or not a book is published. Perhaps it is not fair to expect the publishing houses to have the expertise to conduct quality assurance since most academic titles have such a weak economic base. Some publishers of academic books do not evaluate the titles themselves because they assume that the institution stands behind the book's quality if the institution has provided funding for its publication. The task of the publishing houses, then, is production, distribution and marketing. This situation also seems to result in local authorship (see section 4.4 below) whereby each institution allocates research funds to publish its own researchers' book titles. If this is the case, then this situation could be addressed by creating a nationally edited series for academic monographs and anthologies in the individual academic fields with a well-organised, expedient system of production and distribution. It would be worthwhile investigating whether the book market with the current funding schemes is functioning well enough from a research standpoint.

The conclusion is that it is possible to identify a group of book publishers that has an academic publishing programme with external peer review and that focuses on distribution to researchers and research institutions with a need for academic titles both now and in the future. These publishers can be included in a continually updated register of academic publication channels.

4.3 Register of academic publication channels

A register of academic publication channels (i.e. journals, series, websites and book publishers) must contain at a minimum the name in a standardised form and the ISSN or ISBN code (i.e. the digits before the second hyphen in an ISBN) for each publication channel. In addition, the register may contain background information for each publication channel as discussed in this report (see the comments from the Technical Committee).

In this project, registers of academic publication channels have been developed which are to be used for documenting academic publishing at the universities and university colleges and which are common to all institutions. These registers contain standardised names and numbers for all publication channels. This system will create a more cohesive set of publication data and make it possible to account for different publishing practices in various academic fields when data are analysed. The registers will also make it possible to import references from data sources at the libraries. The documentation of academic publications at the institutions

will consist of a well-organised bibliography with a search function and links to library services and/or to full-text publications.

Based on the definition, a publication must appear in an academic publication channel with an external peer review process if it is to be regarded as academic. In addition to the publication type (see chapter 6), the academic publication channels therefore represent a means of identifying the publications that can be registered as academic in a documentation system. This method of identifying academic publications is an alternative to the reporting method previously used for publication categories. The result is an open, transparent system with objective data showing which publication types and publication channels are regarded as academic according to consensus. The publication channel is an information element in each ordinary bibliographic reference and as such does not represent additional information in the database. In book references the publisher of the book is usually listed; otherwise the journal or series is given. The publication channel is objective information that can be monitored by everyone in bibliographic search services or in the publication itself. Because the data is standardised in the documentation system, it is possible to control the data, generate statistics and perform literature searches.

A complete register of all academic journals, series, websites and publishers throughout the world does not exist. It has been estimated that there are 24,000 academic journals worldwide, and some estimates put this number even higher. International catalogues of journals are available, but they do not contain reliable information about the academic nature of the journals. In addition, the publishing arena is in a constant state of flux as new channels appear while others dissolve, mergers take place and names change.

Nonetheless, a project was launched in Norway in 2004 to survey the Norwegian, Nordic and international publishing arenas used by Norwegian researchers. A documentation system was therefore designed that would “recognise” the academic publication channels actually used by Norwegian researchers and include previously “unknown” academic publication channels in the register each time a Norwegian researcher published his or her work there. The register would also be updated on the basis of international information sources that provide notification of changes in titles, ISSNs and ISBN codes for publishers.

The register has good functionality because at any point in time most of the publications are concentrated in relatively few publication channels. For instance, the ISI indexes annually over one million articles from around the world published in over 9,000 academic journals. In 2003 the ISI index registered 6,600 articles from Norway, and these were published in 2,250 different journals. In other words, most of the ISI journals were not used by Norwegian researchers. Half of the Norwegian articles were published in just 282 journals while the other half was distributed among roughly 2,000 journals. A similar pattern can also be observed in publication channels not included in the ISI index. A study conducted by NIFU STEP, a Norwegian research institute for studies in innovation, research and education, showed that

most journal articles produced in the higher education sector that are not included in the ISI index are published in a relatively small number of Norwegian or Nordic journals. Most series and book publishing is also concentrated in a relatively manageable number of publication channels. This observation was the impetus for recognising the opportunity to create the register.

The documentation system is intended to encompass all publication channels, including those used often, those used less often and those that will be established in the future. As mentioned previously, the publication channels already included in the register will appear with a standardised name and number in the reference. In a few cases, a publication channel will not be part of the register when a researcher attempts to register his or her publication, but the publication can still be registered by entering the publication channel in the free text field. The ISSN (for periodicals and series) or ISBN (for book titles) must be entered at the same time. A message will then alert the system that a new “proposal” for an academic publication channel has been submitted. The publication channel will be controlled and, if approved, added to the register. In this report, the committee recommends that the publication channels be controlled through a common service for the documentation systems that is supervised by a national academic committee. This committee will be charged with the task of following up on the criteria used and taking decisions on borderline cases. This function could be tied to the System Support Service responsible for the import of references from bibliographic data sources.

In 2004 this project developed registers for:

- 13,869 academic periodicals and series, i.e. titles with an ISSN;
- 450 publishers of academic titles with an ISBN.

The number of publication channels should be sufficient to ensure that in at least nine out of ten cases researchers are able to find in the register the publication channels they have used. The problem of currently “unknown” publication channels should thus be reduced to a manageable number in the course of one year. Work on these registers began in early 2004 when NIFU STEP produced a draft of the two lists that later were published on UHR’s website under the heading of academic publishing. The lists were based on various national and international electronic information sources. ISSN titles were evaluated in terms of their objective, content and external peer review process. Publishers were evaluated as to whether they have an academic publishing programme for original titles. Publication channels for both print and electronic publications were taken into consideration.

Referring to the lists published on the website, the Academic Committee asked the national academic councils for their assistance in improving the draft developed by NIFU STEP. They were asked to correct errors and make additions where necessary. They also could correct errors in lists of publication channels sorted out during the process. These efforts were completed in spring 2004. The responses were then sorted at NIFU STEP, and in many cases

ISSNs were found when these had been missing from the proposals for additions. The National Library of Norway then controlled the standardised names and numbers on both lists. The response deadline for the academic communities elapsed prior to summer 2004, but as the writing this report neared completion, proposals for additions to the lists had not been received. It would not have been possible to incorporate the proposals after the formal quality assurance phase at the National Library had begun, but the proposals will be compiled and forwarded from the current project administration to the unit responsible for the continual update of the registers. The function that incorporates previously “unknown” publication channels into the register will meet the need for a dynamic documentation system that does not exclude any publication channel which could be approved as academic.

By necessity a great deal of work went into creating the registers because they had to be built from the ground up. This was a one-time event in 2004. After 2004, the registers can be expanded and improved. Even though the committee believes that the registers now provide adequate coverage and are of sufficient quality to be implemented, they will still require monitoring. The registers have been built so quickly that in some cases questions may be raised about the decisions taken. The committee therefore recommends that in the next phase a critical review of the registers be conducted to determine whether the criteria for inclusion have been properly applied. The first step should be to closely examine the publication channels that have actually been used by researchers during the first year of the new registration system. This will result in a smaller number and make the task more manageable. In this connection, the register should be supplemented with the new type of background information discussed in the following sections.

4.4 Authorship

In keeping with the UHR recommendation *Dokumentasjon av vitenskapelig publisering* (“Documentation of academic publications”) and the NIFU STEP report *Bibliografiske datakilder* (“Bibliographic data sources”), the committee recommends that the publication channels be classified according to whether they have a local, national or international authorship. The definitions given in those documents have been expanded in this report to include the following operational criteria:

- Authorship is *local* when more than two-thirds of the authors published in the channel are from the same institution.
- Authorship is *national* when more than two-thirds of the authors published in the channel are from the same country.
- Authorship is *international* when less than two-thirds of the authors published in the channel are from the same country and the channel uses an international language.

Note that international publication channels could have a local or national authorship according to these criteria. Authorship and language can be determined for journals, series

and websites by reviewing the articles published during the most recent three-year period. For academic titles from book publishers, backlists from the previous three years may be used. Based on the definition of academic publishing, only original publications, not translated works, will be considered.

The criteria used here are the only observable ones if, for example, the objective is to assess the extent to which a journal is “international”. Statistics illustrating the volume of sales or subscriptions for academic publications are usually not available to the public, and these figures are difficult to compare because they depend on the academic context and price level.

One advantage of linking the criteria to authorship is that authorship can give a certain indication of the extent to which a publication channel is attractive to researchers interested in publishing their works across institutional and national borders. An international publication channel cannot be created in one day – its significance for researcher communication must be developed over time. In any case, the criteria cannot address the more subjective designation of “recognised” that is often applied to publication channels. In many of the most widely recognised international journals in numerous academic fields, over two-thirds of the authors are from the USA. The classification system recommended in this report is not intended to simulate or replace evaluations of channels to which the term “recognised” is applied. The significance that an academic community wishes to ascribe to a publication channel must instead be expressed through the choice of the publication channel’s *quality level*. The definition of quality level is presented in the next section and applied in chapter 5 so that the criterion international authorship does not override a selection of international, recognised publication channels.

Classification according to authorship has two other objectives as well. First, *local authorship* must be established in order to determine which publications will be included in the statistics for the Ministry’s budget model. Secondly, in some academic fields *international authorship* must be established to provide a criterion for the nomination of publication channels that will be given additional weight in the budget model. This point will be addressed further in chapter 5, but the committee wishes to comment on local authorship here as well.

The Academic Committee recommends that publications in publication channels with local authorship not be included in the statistics on academic publishing reported to DBH, and which would therefore be included in the Ministry’s basis for setting the research component of the budgets. There are two reasons for this.

First, the question may be raised as to whether a scheme of external peer review can function in a channel that primarily represents the institution’s own researchers. A minimum of national authorship is usually required if external peer review is to function properly in an academic publication channel.

Secondly, it is problematic to tie performance-based funding of the institutions to statistics from publication channels that primarily publish the findings of their own researchers. If this were done, institutions would be encouraged to increase their publishing activity even though the purpose of performance-based funding is to stimulate research activity.

External peer review that is not local is practiced through the disputation system in connection with those publications that appear in the universities' local doctoral series. Some of these series contain articles that have not been published before in other channels or will not be published in the future. If universities would want these publications to be included in the statistics, they could cooperate on a joint doctoral series at the national level.

4.5 Quality level (classification in the budget model)

The term "quality level" refers to the classification of publication channels used in a funding model whereby the publications in a select group of publication channels are given greater weight. With performance-based funding, the use of this type of classification system may be necessary to ensure that the funding model influences the publication patterns in the academic fields in a positive rather than negative direction. By giving greater weight to more demanding, prestigious publication channels, the publication patterns will be prevented from flattening out in the direction of pure quantity. The word "quality" in this context is tied exclusively to this type of overall effect on the publication pattern. A classification of publication channels into quality levels can neither replace nor simulate qualitative evaluations of publications at the individual level, just as a general funding model cannot replace evaluations of and strategies for research activity at the institutions. High-quality publications sometimes appear in less recognised channels and visa versa. The channel should not be used to draw conclusions about the specific publication or the individual researcher, nor is this the purpose.

In chapter 5 the Academic Committee presents a recommendation to classify publication channels into two quality levels in connection with reporting to DBH and the Ministry's funding model. The chapter discusses in detail the implication of the quality levels and their consequences for the budget model. In the section below, the committee wants to emphasise three factors related to the general use of the quality level categories:

- It is important to distinguish between data that document academic publishing on the one hand and the classification of quality level on the other. A classification of quality level is only relevant for a specific budget model. Quality level is not an observable characteristic of the publication channels. Rather it reflects academic evaluations of the desired direction of the general publication pattern, and these evaluations are then entered into the budget model.
- It is uncertain whether the same classification used in the general budget model for all institutions would be suitable for use by specific institutions or academic fields. The

same publication data could be used for different classification systems in different contexts.

- The classification of publications according to quality level must be updated on a regular basis, both because the academic publishing arena is always changing and because experience over time will show how the classification of quality level influences the publication pattern.

5 Two-tiered classification of publication channels

5.1 Discussion

To make the research component in the Ministry's allocations to the institutions performance-based, it would be useful to measure last year's publishing activity in connection with the annual reporting routine. Since educational activity already has a performance-based funding scheme, whereas research activity does not, the introduction of such a scheme could place stronger focus and greater priority on research at the institutions. However, another, and unintentional, impact could be a change in the academic fields' *publishing practices* in a negative direction. If research funding is tied to the number of publications, the result could be an incentive to publish as much as possible with the least amount of effort. A more desirable change would be that greater effort would be expended on the individual publication and that the change in publication practice would move in the direction of higher quality. The question, then, is how to create an incentive for quality in a funding scheme that otherwise is based on the number of publications.

This problem is not easy to solve, as evidenced by examples from other countries. A few years ago in Australia, performance-based funding of publishing activity at the universities was introduced in which all publications were given equal weight. Three years later it was found (according to the ISI index) that the number of articles published had increased in the local journals and least significant international journals. In other countries an attempt has been made to counteract this tendency by giving some publications more weight than others. The Belgian scheme is based on the assumption that publishing in ISI journals in itself implies high quality and thus gives these publications greater weight in the budget model. This has led to strong reactions in the humanities and social sciences where very little publishing occurs in ISI journals. Now ISI often receives inquiries from Belgian researchers who believe that Belgian journals should be included in the index. At the same time, researchers in academic fields well represented in the ISI index believe that the index is a sufficient measure because it covers both significant and less significant journals. To solve this problem, an attempt was made in Finland to tie the funding of research conducted at the hospitals to the ISI *Journal Impact Factor* (i.e. the average number of citations per article during a two-year period). It soon became apparent that this method favoured basic medicine over clinical medicine and certain areas of specialisation over others, and the scheme was discontinued. In Norway a similar funding scheme for research in the health regions has been introduced in which journals are ranked, but the *Journal Impact Factor* is not used directly. In the final evaluation, the classification of the ISI journals into levels is based on academic evaluations of desired publication practices in the various areas of specialisation.

While the ISI journals provide a fairly adequate selection of publications for use in measuring publishing activity in a discipline such as medicine, the situation is quite different when

attempting to document academic publishing in all fields. Although most countries, including those in the Nordic region, use statistics from ISI for international comparisons and certain academic evaluations, it is widely recognised that the selection is too limited to document research activity in all academic fields at all institutions. Due to the lack of good documentation, the UK has introduced a funding scheme based on a system of marks given to a small number of publications that are selected and forwarded to evaluation panels from the institutions. The model therefore consists of ordinary research evaluation, and it is labour-intensive. However, the Nordic countries have waited for a better, more complete means of documenting academic publishing at the institutions, and it now appears that Norway has achieved this. Thus, the question arises once again: How can an incentive for quality be created in a funding scheme based on a count of the number of publications in the new documentation system?

Substantial effort often goes into an academic publication that comes to achieve great significance for further research and applications. It is possible to reduce the amount of work and still publish the findings in one or more academic publications. Usually the tendency to reduce the effort spent on each publication will be counteracted because a peer group employs qualitative evaluations of each publication on a publication list. However, it is not possible to conduct such evaluations at a macro level. Researchers at Norwegian universities and university colleges publish approximately 8,000 to 10,000 academic publications annually, and it is not feasible to evaluate the quality of all of these. Instead, trust must be placed in the external peer review process carried out by the academic publication channels.

The problem can therefore be solved by distinguishing between publications based on their connection to *publication channels*. More weight can be given to the institutions' publications appearing in publication channels with the most stringent requirements related to the quality and originality of submitted manuscripts. This method can neither replace nor simulate qualitative evaluations of publications at the individual level. Neither can it replace evaluations by academic fields or institutions, nor measure quality (to the extent that this is even possible). The method is only able to curb the potentially negative effects of the funding scheme on the *general publication patterns*.

The potential impact of this method is illustrated below in the model for a general publication pattern, where A = highly labour-intensive, significant publications, B = normal publications, C = publications that could have achieved greater significance by expending more effort and being compiled into a smaller number of publications.

Figure 1 – Model for the development of a general publication pattern

	A	B	C
Without performance-based funding			
With performance-based funding, but without levels		→	
With performance-based funding and levels		← →	

The new documentation system makes it possible to measure changes in the general publication pattern over time. The committee recommends that the funding scheme be evaluated as soon as these measurements become available.

As part of its mandate, the Academic Committee was asked to recommend “classifications and rankings of publication channels that give an indication of quality”. The reason that the committee supports the classification of publication channels into levels is that it wants to *ensure that the funding model guides the general publication patterns in the academic fields in a positive rather than negative direction.*

5.2 Two levels

Each academic field has its own unique publication pattern. The patterns vary considerably between academic fields or field groups, but less between institutions and countries *within* fields or field groups. The possibility and necessity of distinguishing between publication channels varies among academic fields, and for this reason the Academic Committee has determined that publication channels should be divided into *two levels* only. The committee discussed the possibility of dividing the channels into three levels since some academic fields have a few highly prestigious international publication channels that might deserve additional weight in a funding model. The committee also discussed the possibility of not dividing the publication channels into levels in those fields where it is difficult to rank some channels above others. It was concluded that all fields could have a need for quality incentives in their publishing practices and that it would be impossible to implement more than two levels in a model intended to encompass all fields. This does not preclude the use of models with greater differentiation at the local level or within certain academic fields.

The Academic Committee recommends that the classification into levels be carried out in the following manner: Each academic field has a unique publication pattern in which certain publication channels and publication types appear most frequently. This is the *normal* pattern that should be protected from potentially negative effects from the funding model. The normal pattern is designated here as *Level 1*, which includes all publications which may be regarded as academic based on the *definition* given in section 3.2. In practice Level 1 will be defined on a continual basis through an updated register of academic publication channels. Consequently, Level 1 does not consist of publication channels specifically named in a funding model.

To create *Level 2* on the basis of Level 1, certain publication channels are *designated* to appear on a list representing *Level 2*. This list, which relates to a specific budget model, is updated annually through an academic approval process. According to recommendations made in this project, the publication channels designated as Level 2 must:

- be perceived as the leading publication channels in a wide variety of academic contexts;
- publish the most outstanding works by researchers from different countries.

The publication channels in Level 2 should comprise roughly *one-fifth of the publications* produced by an academic or research field. This proportion can be measured by using international data in those academic fields where this is available (see the description of Academic Field Group A in section 5.5 below) or with data from the new Norwegian documentation system (see the descriptions of Academic Field Groups B and C in the same section).

The question may then be raised: If four out of five publications appear in “normal” publication channels, where should the top one-fifth be published if these are to receive extra weight as the most significant and most labour-intensive publications? This question should be posed in relation to the specific academic or research field at the national level, not in relation to individual researchers or institutions.

5.3 Differences among academic fields

As already mentioned, publication practices vary among academic fields. In some fields it will be both possible and necessary to nominate a narrow group of publications from among the many journals found at the international level. In other fields it will be more useful to distinguish between national and international levels and/or nominate several different types of publication channels rather than journals only. In some fields most publishing takes place in Norway in the Norwegian language. This will then comprise the normal publication channels in Level 1, where four out of five publications will be appear. Level 2 should thus not provide an incentive to publish more often in Norway in Norwegian, but to publish in channels that serve as forums for international research on specific topics. The result will be larger research communities to conduct quality assurance and a wider dissemination of findings from Norwegian research activity.

Because academic fields have different publishing practices, it is necessary to establish different guidelines for use in nominating publication channels to Level 2. In this case, the norms of one academic field must not be projected onto another. The fact that historians do not publish as often in international journals as physicists does not necessarily reflect a weakness in history as an academic field. While American journals in physics publish articles from throughout the world, the American journals in history publish mostly American articles. In all countries historians primarily use national publication channels, and they

publish just as often in books as in journals. Norwegian historians do, however, publish in channels with international distribution, and among these it may be appropriate to nominate the *Scandinavian Journal of History* to Level 2. Physics also has a Nordic journal, *Physica Scripta*, but perhaps it would be advisable for Norwegian physics to nominate other journals to ensure that the most significant journals are included in Level 2. In short, the same guidelines cannot be applied to the entire spectrum of academic fields.

Based on an empirical study conducted by NIFU STEP for this project, the Academic Committee has found that the publication patterns in the academic fields can be classified into three main groups. These three groups have been issued different guidelines for use in nominating publication channels to Level 2. In the section below, an explanation of the study is presented first, followed by a description of the publication pattern and guidelines for each group.

5.4 Publication patterns in three academic field groups

An analysis was performed of a select group of publications in all academic fields – from physics and biochemistry to architecture and art history. Data were compiled from the journal indexes (Web of Science) at ISI as this is the only data source that provides information about all author addresses and registers the entire reference list for each publication. First, the data were analysed to determine which publications are referred to in the reference lists. Reference lists were extracted from a representative sample of articles from leading ISI journals in various academic fields, which resulted in a list of 27,000 references. Secondly, the study investigated the degree to which articles from the USA are represented in the journals as compared to articles from the UK, Germany and Sweden. This was achieved by analysing a total sample of 240,000 articles from leading journals in various academic fields. The study showed clear differences among the groups of academic fields.

- The proportion of articles from the *USA* versus the UK, Germany and Sweden out of the total for these four countries varies from 58 per cent in physics to 99 per cent in law.
- The proportion of references from *journal articles* varies from 12 per cent in art history and drama to 99 per cent in immunology.
- The proportion of references from *articles in journals indexed by ISI* varies from 3 per cent in theology and religious science to 96 per cent in molecular biology.
- *The average year for cited publications* in the reference lists varies from 1920 in architecture to 1998 in physics.

These findings speak to the variation in publishing practices:

- How important are journal articles versus other types of publications?

- To what extent are the journals in an academic field included in the ISI index?
- To what extent do the “international” journals have an international authorship?

The findings also say something about the usefulness of classifying journals based on how often the journals are cited per article published (*Journal Impact Factor*) if the objective is to create a list of leading journals. In order for citation frequency to be useful in identifying leading journals, the criteria should include a low average age for cited publications, a high ratio of references to journal articles, and good coverage of the field’s journals by the ISI index.

Based on these observations, the journals and the academic fields they represent formed *three main groups of publication patterns*. The differences and similarities do not completely correspond to the traditional division of academic departments. *Table 1* below shows how some academic field names (out of several possibilities) can be grouped according to publication pattern.

It is important to note that focus has been placed primarily on *publication patterns*, not on academic fields, and that the three academic field groups are intended to reflect the differences in publication patterns in a manner that makes it possible to *formulate adequate guidelines for use in the nomination process*. It is publication channels, not academic fields, which are nominated. For example, publication channels such as *Cambridge University Press* for academic book publications or *Science* for academic articles could be nominated in several different fields. The question is how to formulate guidelines to ensure that the individual publication channel nominated points in the direction of quality for the general publication pattern in each of the three groups. The academic field names in *Table 1* are an adaptation of the corresponding classification of journals in the ISI index. Any such classification by academic field is problematic, partly because the journals often are cross-disciplinary and/or specialised and partly because it will always be possible to make the classification more nuanced. If the name of an academic or research field is missing from *Table 1*, it is nonetheless possible to find the group affiliation, which is the most important consideration. The group affiliation may be found by using the *list of ISI journals*. The list contains 9,218 journals and should encompass most academic fields, areas of specialisation and cross-disciplinary research fields. For example, if a researcher works in a field in which *Women’s Studies International Forum* is representative, he or she can look at the list and see that the field falls under Group C. The fact that the field is sorted under “cross-disciplinary social science research” is not of great importance. The most important consideration is that the researcher is able to find the correct group and corresponding guidelines for nomination as described in the section below.

Table 1 – Groups of publication patterns. The academic field names in the table indicate the group affiliation for the various fields. All academic fields, areas of specialisation and cross-disciplinary research fields, including those not listed, may be assigned to one of these groups.

Group A	Group B	Group C
Astronomy and astrophysics	Business administration, finance, management	Anthropology and ethnology
Agricultural sciences	Informatics	Archaeology
Biological sciences	Library and information science	Architecture
Chemistry	Mathematics	Art history
Cross-disciplinary natural sciences	Media and communication	Classical studies
Dentistry and oral biology	Social economics	Criminology
Environmental research	Social work	Cross-disciplinary humanities research
Fisheries science	Statistics	Cross-disciplinary social science research
Food technology	Technology	Drama
Geosciences		Education
Materials science		Geography, demographics and regional development
Medical sciences		History
Nursing science		Humanistic media research
Nutritional science		Labour research
Pharmacology and toxicology		Law
Physics		Linguistics
Psychology		Literary research
Sports research		Music
Substance abuse research		Philosophy
Veterinary medicine		Political science
		Sociology
		Theology and religion

It is important to note that the classification of academic fields is only necessary for formulating different guidelines for use in nominating publication channels to Level 2. The end result of the nomination process in all academic fields will be a list of publication channels at Level 2 which is *not divided by academic field*. Researchers in all fields may use all channels included in Level 2. The classification into academic field groups should therefore be regarded as “provisional” and tied only to the nomination process.

5.5 Guidelines for nomination

The guidelines presented in this report are used in cooperation with the national academic councils of autumn 2004 (see section 5.7). The guidelines are described in general here with a view to an annual update of Level 2 on the basis of an academic approval process. The nomination process should then be based on the updated authority register of publication channels. The *list of ISI journals* mentioned above is an additional aid that should also be kept up to date. This list serves two functions related to the nomination process. First, as mentioned above, it should be possible to find the group affiliation for an academic or research field in cases of doubt by observing how known journals have been classified. Secondly, the list will contain a *draft* of ISI journals in Level 2. This point requires further explanation.

The *draft* should be produced on the basis of a ranking in accordance with the *Journal Impact Factor* (JIF). This ranking should be updated each year with new figures for articles and citations. This is not because the JIF ranking is recommended, but because the guidelines for further adaptation require this draft to be produced first. When establishing a ranking according to JIF, the different citation frequencies in the various academic fields must be taken into account. In practice this means that relative indicators within each academic field should be established in relation to the average value for the field.

Group A will then contain a draft for which it is possible to ensure that Level 2 represents one-fifth of the global article production. This is a prerequisite for the *replacement principle* as described below under Academic Field Group A. The two other groups will contain a more random draft in which Level 2 still represents one-fifth of the global production (within the ISI index), although these journals are dominated to a greater extent by the USA (and therefore do not come close to representing one-fifth from a Norwegian or European perspective). However, leading American journals do appear in Level 2, and those that deserve to be included in Level 2 may be retained and do not need to be excluded because they do not satisfy the requirement for *international level* (i.e. authors from different countries) that is otherwise used in Groups B and C. This is a prerequisite for the *replacement and supplement criterion* used in Groups B and C. Monitoring of Level 2 to ensure that it represents one-fifth of the publications must be performed in the Norwegian documentation system in Groups B and C.

It should be emphasised that the ISI journals and *Journal Impact Factor* are used only in a technical sense to produce a draft upon which the guidelines are based. In all groups adjustments will have to be made. In Groups B and C a draft will seem more or less random, and Level 2 could include publication channels (i.e. journals, series, book publishers and websites) not included in the ISI index. The general rules for inclusion in Level 2 revolve around issues of quality. To repeat, these journals must:

- be perceived as the leading publication channels in a wide variety of academic contexts;
- publish the most outstanding works by researchers from different countries.

Academic Field Group A

In *Academic Field Group A* most publishing occurs in journals, and these journals usually have an international authorship. The most significant journals usually have a high annual volume and high rate of remuneration, and cover a broad range of topics compared to other journals. Most journals in Academic Field Group A are included in the ISI index. Calculations of citation frequency for journals are somewhat useful for creating a draft of publication channels in Level 2, but differences in average citation frequency for journals in different academic fields must be taken into account.

Guidelines for Academic Field Group A:

- Only journals can be nominated, and these must be recognised as the foremost leaders in a wide variety of international academic contexts.
- The criterion *international level* is defined as follows: Less than two-thirds of the authors are from the Nordic region or from the same country. The channel is published in a language regarded as international in that academic field.
- *The list of ISI journals* is used as the starting point, and nominations are made in the form of proposals for replacements. If a journal placed in Level 1 in the draft is nominated for Level 2, another specified journal in Level 2 must be transferred to Level 1. The journals nominated for transfer from Level 1 to Level 2 must be at the *international level*.
- Proposals for nominations must state the journal names and give a prioritised order. The names of journals to be transferred out of Level 2 in the ISI list must also be given.

Academic Field Group B

In *Academic Field Group B* academic publishing occurs primarily in the form of articles and most often at the international level. However, the articles may appear in both journals and conference series, and monographs may be published as well. The publication pattern is more widely dispersed among different types of publication channels that specialise in specific topics. The journals are not covered as well by the ISI index, and the ranking according to the *Journal Impact Factor* produces more random results in a draft of Level 2.

Guidelines for Academic Field Group B:

- Journals, series and book publishers can be nominated. These must be recognised as the foremost leaders in a wide variety of international academic contexts.
- The criterion *international level* is defined as follows: Less than two-thirds of the authors are from the Nordic region or from the same country. The channel is published in a language regarded as international in that academic field.
- *The list of ISI journals* should be evaluated critically in relation to the first point. Journals in Level 2 that should not appear there should be nominated for transfer to Level 1. Level 2 will then be supplemented with journals that correspond with the first point and that are at the *international level*. These may or may not be included in the ISI index.
- Academically edited conference series may be nominated if they are at the *international level* and if the series is not affiliated with an academic journal that publishes a selection of articles from the series. Publishers of conference reports that are not a series cannot be nominated.

- Publishers of academic ISBN titles can be nominated if they are at the *international level*. (This point has been deleted in later guidelines for Group B.)
- Proposals for nominations must state the journal names and give a prioritised order. The names of journals to be transferred out of Level 2 in the ISI list must also be given.

Academic Field Group C

In Academic Field Group C publishing occurs more often in the form of books than in the other groups, and in all countries academic publishing takes place more frequently at the national level. A few large, key book publishers and a few smaller specialised publishers are used in Group C. A large number of journals are also used, but these are small and specialised, and their inclusion in the ISI index is coincidental. Those included are often dominated by articles from the USA. *Journal Impact Factor* is not useful for identifying leading journals in this group.

Guidelines for Academic Field Group C:

- Journals, series and book publishers can be nominated. These must be recognised as the foremost leaders in a wide variety of academic contexts.
- The criterion *international level* is defined as follows: Less than two-thirds of the authors are from the same country, and the channel is published in a language regarded as international in that academic field.
- *The list of ISI journals* should be evaluated critically in relation to the first point. Journals in Level 2 that should not appear there should be nominated for transfer to Level 1. Level 2 will then be supplemented with journals that correspond with the first point and that are at the *international level*. These may or may not be included in the ISI index.
- Publishers of academic ISBN titles can be nominated if they are at the international level. This is also the case for publishers of academically edited anthologies and conference reports.
- Proposals for nominations must state the journal names and give a prioritised order. The names of journals to be transferred out of Level 2 in the ISI list must also be given.

The Academic Committee recommends that an exception to the guidelines be made in Group C. The analysis of publishing practices showed that 99 per cent of the articles in the leading ISI journals in law are from the USA. This indicates a distinctly nationally oriented publishing practice for most of the research in this field. In other fields in Group C, countries other than the USA are more widely represented in leading international journals. For this reason, the committee recommends that *Tidsskrift for rettsvitenskap* (a law journal with a Nordic authorship and Norwegian editorial unit) be eligible for nomination to Level 2.

The differences among the three groups may be summarised as follows:

- In Academic Field Group A the draft of the ISI list will be used as the starting point. The draft of Level 2 cannot be expanded by adding more journals, but proposals for *replacements* will be considered.
- In Academic Field Groups B and C unreasonable proposals to Level 2 will be removed from the draft. Additions may be made according to the criterion for the *international level*.
- Academic Field Group B has a more stringent requirement for conference publishing than Group C. In Group B conference reports must be published in an academically edited series, while in Group C publication by an academic book publisher is sufficient.
- All groups are subject to the general requirement that the publication channel must be regarded as a leader in a wide variety of academic contexts, but Group C may also nominate *Nordic* publication channels that publish in a language regarded as international in that academic field as long as the channels also meet the general requirement.

The purpose of the different guidelines is to promote the development of or maintain good publishing practices in the various academic fields. The guidelines have been formulated so that they can be followed up with an annual academic approval process that makes adjustments in Level 2 in response to developments in the academic publishing arenas. This process should involve the national representative bodies for the academic fields and be led by a committee charged with the overall responsibility for the academic fields and institutions in the sector.

5.6 Potential impact on publishing practices

In several of its academic evaluations, the Research Council of Norway has pointed out that Norwegian researchers do not set ambitious goals for their publication practices. This has also been shown in a general bibliometric analysis published by Dag W. Aksnes in the research policy journal *Forskningsspolitikk* No. 4/2002 entitled “Lave ambisjoner i norsk forskning?” (“Low ambitions in Norwegian research?”). The evaluations and analysis primarily address the situation for Academic Field Group A. Here the point of departure is international publishing – the question being in *which* international journals researchers publish their works. In the future it will be possible to measure changes in the publication pattern in Group A with the same method used in the article by Aksnes. It will also be possible to see whether the guidelines function as intended.

A number of evaluations, as well as the debate on national research policy, have pointed out the need for *more international publishing* in the humanities and social sciences. Some of the

academic fields identify with this objective. This is true for the social sciences in particular, as well as for the internationally oriented humanities fields. In this case, international data that could be used to measure changes in publication patterns are not available, but changes could be measured using the documentation system now being established for the higher education sector. From the perspective of Academic Field Group A, it may seem that ambitions have been set too low in the guidelines for Academic Field Groups B and C because it is possible to supplement Level 2 with publication channels and publication types not included in the ISI index by applying no other criteria than the *international level*. However, for Groups B and C this is a stringent criterion that results in a limited number of channels. For instance, it is unlikely that any book publisher in the Nordic region is at the international level. Also, the Nordic journals, series and websites at the international level must be so prestigious that they attract authors from around the world in academic fields where much of the publishing occurs at the national level. The criteria *international level* is so stringent, in fact, that many ISI journals regarded as leaders in their fields cannot satisfy it. Yet the criterion is open in the sense that it supports the continuation of a publishing arena consisting of a diverse group of small, specialised channels at the international level, which contrasts with the hierarchical structure of Group A characterised by general, leading journals at the top.

In Academic Field Group C the international level criterion is defined to allow for the inclusion of the Nordic publication channels with an international language in certain well-justified cases. While these publication channels were used frequently by Groups A and B in the past, they are no longer used as often due to the internationalisation process that has occurred simultaneously in many countries. However, these channels may continue to be important as international channels for Group C because publication practices continue to be nationally oriented in some countries. To illustrate, the *American Journal of Sociology* and *American Sociological Review* almost exclusively publish American articles and rarely publish Nordic articles, while the Nordic journal *Acta Sociologica* publishes both Nordic and American articles (and articles from other countries as well).

Moreover, Academic Field Group C is the one most affected by the committee's recommendation that publications in publication channels with *local authorship* not be included in the calculation of performance-based funding of the sector. In other words, these publications will not be found on either the Level 1 or Level 2 list. This may result in a shift to journals, series and publishers with a minimum of a national authorship, which in turn could put pressure on the funding schemes for academic journals and monographs at the Research Council of Norway and the Nordic Publishing Board. Academic journals and monographs at a national or Nordic level usually depend on funding in order to publish, but the annual budget allocated for this purpose is not large. There may be calls to increase funding for a larger number of journal volumes and monographs. It is important to be aware that this could result in a shift from a local to a national and Nordic authorship. In particular, this would affect publications that present findings which are most relevant to cultural and

social conditions in Norway and the Nordic region and less relevant to international researcher communication.

5.7 Results of the nomination process autumn 2004

In autumn 2004 the Academic Committee led a consultative round of the national academic councils and similar advisory bodies during which they were asked to participate in the process of nominating publication channels to Level 2 in accordance with the guidelines and aids described in section 5.5. The material was distributed both directly and via UHR's website. It was not easy to conduct this nomination process, partly because the deadline was short within the framework of the project (a relatively complete authority register for the publication channels was one of the conditions for the consultative round) and partly because some of the academic councils were not in session at that time. In addition, for some of the academic councils this issue was totally new and thus a challenge to gain a handle on. Nonetheless, some of the academic councils offered productive and complete input in relation to the guidelines.

This consultative round has generated a number of proposals for publication channels to Level 2 that have been quality assured within the framework of this project. However, these channels represent only a few of many that could be nominated according to the criteria. Input from several academic fields is still needed to make Level 2 complete.

Nonetheless, the Academic Committee recommends that a funding model be implemented using Level 2 in its current form. At the same time, the committee recommends conducting a new round with the academic communities in order to make Level 2 more complete. This should be done during 2005 when the users have become better acquainted with the system, the academic communities are better prepared, and more time can be devoted to the task. Because the funding model apportions funds among institutions, not academic fields, it is not essential that Level 2 be complete for all academic fields in the start-up phase. Level 2 should be completed soon, though, and the launching of the funding scheme could provide the impetus for this.

6 Academic publication types

6.1 Definition

The Norwegian publishing house Universitetsforlaget publishes academic books, and the journal *Nature* publishes academic articles, but not all the books published by Universitetsforlaget or all the articles in *Nature* are academic. The term *academic publication type* refers to those publications in an academic publication channel (journal, series, website, book publisher) that may be regarded as academic. It is necessary to identify publication type, in addition to publication channel, to distinguish academic publications from other types of publications. After this distinction has been made, it is also necessary to distinguish between academic publication types which represent different levels of effort or which have varying degrees of significance in order to maintain or promote a publication practice with a reasonable balance between publication types. This is especially relevant in relation to the weighting of publication types in a funding model; see chapter 7. This chapter presents a classification of three academic publication types: academic monographs, academic articles in an anthology, and academic articles in a periodical or series.

6.2 Three academic publication types

As a starting point, only publications registered or affiliated with an ISBN or ISSN are included in the definition. Publications referred to as “grey literature” are not regarded as academic, nor are preprints, which should not be registered before they are published. Based on their affiliation with an ISBN or ISSN, three main types of publications can be identified (see points 1a, 2a and 3a below). If publication type is further restricted according to the definition of academic publishing as stated in section 3.2 (reference is made below to the four points in the definition), the result is a classification that also is based on the definition (see points 1b, 2b and 3b below):

1. *Academic monograph:*
 - a. The publication has a title with an ISBN. It may have one or more authors, and the names are listed in connection with the title.
 - b. The publisher must have routines for external peer review, cf. point 4. Textbooks or books for the general market are not regarded as academic monographs, cf. points 1-3.
2. *Academic article in an anthology:*
 - a. The publication does not have its own number, but it is associated with a title that has an ISBN. It may have one or more authors, and the names are listed in connection with each publication.
 - b. The anthology must have an academic editorial unit with an external peer review process, cf. point 4. Textbooks and books for the general market are not regarded as academic monographs, cf. points 1-3. All complete articles in

anthologies and articles in which the editors put the content in context (i.e. introduction or conclusion) are regarded as academic. Any foreword, summary, discussion or other material is not included in the definition of academic.

3. *Academic articles in a periodical or series:*

- a. The publication does not have its own number, but it is associated with a title that has an ISSN. It may have one or more authors, and the names are listed in connection with each publication.
- b. The journal, annual or series must have an academic editorial unit with an external peer review process, cf. point 4. The definition includes original articles and literature reviews, cf. points 1-3, but not editorials, book reviews, discussion articles and other material. However, book reviews of a length and form similar to literature reviews are regarded as academic.

Note that a book chapter is not a separate publication type. Either a publication is an article in an anthology or a monograph, possibly written by several authors (co-authorship).

6.3 Literature reviews and academic book reviews

In fields with a predominance of journal publications, literature reviews are recognised as an academic publication type. These articles represent such a substantial amount of work with the existing literature that the articles themselves present new insight. Also, because literature reviews are so important for further research activity, there is no doubt that they fall under the definition of academic publishing. In fields that publish extensively in academic books, articles in *academic journals* are equally important since these present a thorough discussion and evaluation of research findings published in new books. These articles are often referred to as book reviews, but they are different from the brief presentation and evaluation usually found in shorter articles of the same name. The Academic Committee wishes to place the large, detailed book reviews in the book-oriented fields on equal footing with literature reviews in the journal-oriented fields. The assumption is that the book reviews are published in academic journals and that they present thorough evaluations of academic publications. This is made possible in practice by specifying a *group of journals* that are included in the authority register of ISSN titles and covered by the data source Norart or ISI. In Norart book reviews in large-scale formats in certain journals are indexed as academic articles. In ISI articles designated as “book reviews” are regarded as academic articles if they are associated with specified journals. For future expansion, and with a view to self-reporting of publications in journals not found in the two data sources, the following is a suggested definition of book reviews that could be included:*

- The article has a minimum of 3 pages;
- The article presents a thorough discussion of one or more new academic publications that have implications for further research activity.

* Due to technical problems, book reviews have not been included since the first year of implementation.

7 Weighting of publication types and publication channels

7.1 Discussion

In a documentation system the academic publications will be defined in practice by the *publication channel* (only publications in academic publication channels are regarded as academic) and *publication type* (certain publications in an academic publication channel are academic, but not all).

Chapter 5 presents a recommendation for a two-tiered classification of publication channels, in which Level 1 is given “normal” weight in a funding model and Level 2 is given additional weight. The purpose is to promote the development or maintenance of good publishing practices in the academic fields.

Chapter 6 presents three different academic publication types:

- Academic monograph
- Academic article in an anthology
- Academic article in a periodical or series

The publication types have been classified in this way because they represent different levels of effort or have different degrees of significance, and making such a distinction will help to maintain or promote publication practices with a reasonable balance among publication types. If this distinction were not made and all publications were regarded as academic, the result could be unintentional changes in the publication patterns.

It is useful to weight different *publication types* and *levels of publication channels* in an overall funding model. This chapter examines these weights in context and presents a recommendation for a method of numerical weighting. The Academic Committee wishes to make this recommendation even though the formulation of the budget model is the Ministry’s responsibility.

Chapter 5 discussed the differences among academic fields in connection with the classification of publication types into levels. Before recommending a method of numerical weighting, it is important to show that the weighting of publication types also poses a challenge when developing an overall model intended to encompass publishing practices in all academic fields.

7.2 Publication types and differences among academic fields

As a starting point, the academic publication types must be weighted in relation to each other in the same manner in all academic fields. The alternative would be to link the registration of a publication to the academic field to which the researcher, institution or publication channel belongs. This alternative is problematic for several reasons. First, it would restrict opportunities for cross-disciplinary research and publishing. Secondly, it would require a register of researchers and institutions classified by academic field, but institutions organise academic fields in different ways in terms of both subject areas and researchers. It is also difficult to classify publication channels according to academic field. Numerous journals, series, websites and publishers represent several different fields or cross-disciplinary specialisations. The committee's solution for classifying publication channels (see chapter 5) does not require a breakdown by academic field. The publication channels nominated for Level 2 will apply to everyone, regardless of field. Also, when weighting publication types, the committee has recommended a common model for all fields to avoid an intricate documentation system with problematic classifications of researchers, institutions or publication channels by academic field.

The challenge, then, is that the view of how publication types should be weighted will vary from field to field. To put it simply, this issue can be seen from the perspective of the "journal-oriented fields" on the one hand versus the "book-oriented fields" on the other. However, it is important to note two relevant points. First, some fields in the social sciences and humanities tend to be more journal-oriented than others. For instance, economics and linguistics are more journal-oriented than sociology and history. For this reason, among others, the journal-oriented fields are also heterogeneous, which leads to the second point. Technology fields and informatics mainly publish academic articles, but these are published more often in conference series than in journals. In addition, mathematics is different from the natural sciences and medicine in that the articles may be longer but published less frequently, which is similar to monographs in the book-oriented fields.

Despite these nuances, the book-oriented and journal-oriented fields will differ overall in their view of how academic articles and books should be weighted. The book-oriented fields will tend to give more weight to monographs than to articles. In many cases, the monograph is the format that must be used to generate new insight, while the articles may be more or less dependent on the research findings that have been or should have been published in a larger format, such as a monograph. Also in the book-oriented fields, the tendency will be to weight publications according to the number of pages on the assumption that the research effort is closely tied to the writing process. This contrasts with the journal-oriented fields, in which the articles should be as short as possible and report on research activity that is not directly related to the writing process. In the journal-oriented fields, a six-page article may represent an extensive, long-term research project involving several members of a researcher group. Large-scale projects presented in several articles could also be summarised and discussed in a

monograph although literature reviews will remain the preferred form. In this case, monographs are usually in the form of handbooks and textbooks. The journal-oriented fields will therefore tend to give less weight to monographs than to articles.

A forum for uniting these differing views of monographs and articles is the doctoral degree scheme, in which a monograph in the book-oriented fields is considered to equal three to five articles in the journal-oriented fields, assuming the work involves roughly the same time commitment. The Academic Committee recommends that the doctoral degree schemes be used as the basis for establishing the weighting of monographs in relation to articles and that the various fields otherwise base their approach on a mutual recognition of the effort that lies behind the other fields' preferred academic publication types.

The Academic Committee distinguishes between articles in *anthologies* (without affiliation with an ISSN) and articles that can be linked to academic periodicals and series (with an ISSN). Most of the anthologies published consist of articles based on papers presented at academic meetings and/or invited manuscripts, which could be difficult to refuse if they do not meet expectations. Some are also current affairs books or textbooks. In certain fields and contexts, anthologies may be a prestigious publication type, relying on literature reviews by researchers who write on the basis of an extensive body of research. However, it is difficult to account for this in a general method of weighting. The Academic Committee recommends giving anthology articles less weight than articles affiliated with ISSN titles. One reason for this is the greater uncertainty as to whether anthology articles fall under the definition of academic (i.e. the requirement for a minimum of national authorship and the definition's first point regarding "new insight" in relation to previous and upcoming publications by the author in question). Another reason is the desire to provide an incentive to publish in publication channels with an academic editorial unit, external peer review process and well-established distribution.

In this context, the Academic Committee wants to point out that the most significant international publishing houses publish their anthologies in series with a main editorial unit that is academic in nature. Moreover, the most important international conference reports are published in series. Articles in series (ISSN) are not regarded as anthology articles and are thus weighted the same as articles in academic journals.

7.3 Recommendation for weighting of publication types and levels

A recommendation for the weighting of publication types according to the two-tiered classification of publication channels is shown in Table 2.

Table 2 – Recommendation for weighting of publication types according to the two-tiered classification of publication channels

Publication type	Level 1	Level 2
Monograph	5	8
Article in a periodical or series	1	3*
Article in an anthology	0.7	1

* A weight of 5 was proposed in the original report, but this was changed to 3 when the model was implemented.

The arguments for using different point values for the publication types at Level 1 are discussed in the section above. For ISBN publishing (i.e. anthology articles and monographs) the difference in point values at Levels 1 and 2 is reduced for articles affiliated with ISSN titles. There are two arguments for this approach:

- In fields that primarily publish articles in international periodicals and series, it is necessary to give a substantial incentive to publish at Level 2 because the leading publishing channels set extremely high standards for the articles they accept for publication. To be accepted, both the effort behind the article and the significance of the findings presented must be substantial. In fields that often publish articles in Norwegian (in anthologies, series or periodicals), it may be necessary to give a similar, additional incentive to publish some of these articles in periodicals and series at the international level.
- In many fields ISBN publishing occurs in a Norwegian and international book market in which a small number of publishing houses and funding schemes (i.e. the Research Council of Norway, other national bodies and the institutions themselves) play a relatively important role. In these cases, there is reason to be careful not to create too large of a difference between the publishing houses at Levels 1 and 2. Moreover, high point values could create a disparity between the funds that the institutions receive to conduct research and the funds needed to support a new book publication by, for example, an international publishing house.

7.4 Field factors?

As mentioned above, articles in mathematics produced as part of normal research activity are often longer and published less frequently than articles in the natural sciences. In other words, the anticipated number of publications within the same publication type is different depending on the field. The recommendation *Forskning med tellekanter* (“Research that counts”, UiO, 2003) uses a term that can be translated as *field factor* to refer to these differences, but to date it has not been possible to quantify this concept. The basis for a quantification of field factor must be empirical and based on bibliometric studies. A report on this topic by the University of Oslo is yet to be produced, and the concept of field factor has not been evaluated or

investigated as part of this project. If a method is devised to calculate field factors independent of other factors that determine the length of publications within a certain publication type, these field factors should be included in budget models, but not in the documentation itself or in the measurement of academic publishing. The problem is parallel to, for example, an attempt to offset differences between types of institutions in the budget model based on anticipated differences in academic production. Such differences should not be evened out by creating different definitions of academic publishing for different institutions.

8 Authors and institutional affiliation

8.1 Discussion

An academic publication is usually the result of a cooperative effort between several researchers, but the degree to which this is reflected in the publication's author by-line varies among fields. In the humanities and social sciences, only one author is usually credited per publication. In other fields, it is most common to credit several authors per publication. In these cases, the authors list the addresses of several institutions. This occurs partly because the members of the author group are affiliated with different institutions and partly because an individual author lists his or her affiliation with more than one institution. When this phenomenon is measured in the Norwegian articles registered by ISI in 2003, the natural sciences and medicine are overrepresented. Nonetheless, the measurement gives an idea of how the pattern would appear for most of the articles published in international journals from the higher education sector. The table below illustrates such a measurement for 2003.

Table 3 – ISI-registered articles from Norway in 2003 classified by number of authors and author addresses per publication

X number	Articles with x authors	Articles with x addresses
1	838	208
2	1198	1853
3	1236	1850
4	1016	1225
5 to 10	2006	667
11 to 100	339	235
Over 100	40	0

Half the articles have two to four authors and author addresses, and the number of articles with more than five authors and author addresses far outweighs those with one author and author address. The average number of authors and author addresses in ISI articles (both in Norway and internationally) has doubled since the early 1980s. This reflects increased focus on institutional and international cooperation, as well as a greater tendency to measure productivity. Cooperation on publications results in more publications per author.

Many academic publications produced by the higher education sector are published by authors from more than one institution in the sector. Moreover, a large number of publications have co-authors at institutions from outside the sector and from abroad. Many researchers employed at one institution also hold part-time positions at other institutions, and it is common for researchers to move between these, which may occur while an article is being prepared for publication. *Therefore, a clear relationship usually does not exist between author and employee or between publication and institution.* The issue of how publications are credited to an institution or how they are divided among institutions is not easy to resolve,

neither when creating statistics nor when developing a documentation system. The Academic Committee assumes that *on the whole the institutional addresses listed by the authors in their publications will provide a good indication of those institutions that have contributed to the results*. This is the basis for the solutions recommended in this chapter.

8.2 Institutional affiliation based on the publication

In principle, there are two ways to link a publication and an institution in a documentation system:

1. The publication is linked to the institution(s) where the author(s) are employed when the publication is registered.
2. The publication is linked to the institution(s) that the author(s) list as the author address in the publication. This applies to cases in which a single author lists more than one address in a publication and when a group of authors lists each of their affiliated institutions.

The first alternative is most advantageous from the perspective of the documentation systems because a registration system based on employment is simpler. The disadvantage of the first alternative, however, is that discussion and uncertainty may arise when two or more institutions claim credit for the same publication. The point in time when the research, publishing, employment and registration of the publication occur will vary. As a last resort, access to wage and personnel registers and other documentation would be needed to decide the outcome of a case.

The Academic Committee recommends that the second alternative be followed due to the advantages it offers:

- When a researcher moves from one institution to another, credit is given to the institution that has contributed to the research at the point of publication.
- Discussions are avoided regarding the extent to which emeriti, guest researchers, research fellows, etc. should be included. Every publication that credits the relevant institution can be included.
- The publication tangibly exists, thus providing an objective datum for determining affiliation in case several institutions claim credit for a publication by the same author. Also, the author address for most publications will be registered in a bibliographic data source.
- At the point of publication the authors can decide themselves which and how many institutions should be credited. In some cases, it could be appropriate to credit other institutions or more than one of the institutions with which the researcher has an employment relationship, for example, if the researcher has conducted research abroad or received external funding.

- The second alternative is consistent with international practice: Authors list the address of the institution(s) that have had significance for the author's research activity.

The disadvantages with the second alternative are that bibliographic data sources showing author addresses do not include all relevant publications and some publication channels lack information on the authors' institutional affiliation. In these cases, the person registering the publication should follow the principle that the institution(s) which have contributed to the publications should receive credit. In the mandate for this project, the Ministry has stipulated the following requirement: "The institutional affiliation entered in the original data from the bibliographic data sources is to serve as the basis for crediting publications to different institutions." This means that the potential problems with self-reporting in relation to the second alternative must be solved.

8.3 Apportionment of publications when several institutions cooperate

When researchers cooperate on projects or hold positions across institutional or national boundaries, their publications will be affiliated with several institutions at the same time. The new research documentation system will be able to show when a publication is affiliated with more than one institution. With these statistics it will therefore be possible to count the actual number of publications in the higher education sector. This contrasts with the system used to date, which has generated publication lists that do not allow for multi-institutional affiliation.

The question then becomes how to calculate the contribution of several institutions to the same publication. This question is relevant at the overall statistical level, where a calculation must be developed to apportion the publication among the institutions. Of course, this does not mean that the researchers' individual publication lists will consist of "parts of publications". At the macro level, however, the various publication practices and forms of cooperation must be made comparable. The committee recommends that the calculation take into account the number of authors contributed by each institution, as follows:

- A publication with 1 author is worth 1 point.
- A publication with n authors is worth $1/n$ point for each author.
- An institutional share is calculated as the sum of the shares for those authors who list that institution in the author address.
- If the institutional share equals less than $1/10$, the share will still be set at $1/10$.

The final point takes into account a small number of publications on which large, international groups of authors collaborate.

The calculation requires documentation in which all authors and institutional affiliations are registered. In most cases of co-authorship, this documentation should be able to be imported from bibliographic data sources.

8.4 Weighting of institutional or international cooperation?

The Academic Committee has considered whether the method of calculation presented above could produce a negative incentive to cooperate across institutional and national borders. The committee recommends that this question be followed up with empirical studies and a study of the other incentives that exist for institutional and/or international cooperation. If it is found expedient to give greater weight in the funding model to publications representing institutional and/or international cooperation, the committee recommends that the calculation model presented above be used and the point values be multiplied by a designated factor. This solution would be preferable to one that excludes certain institutions from the calculation of institutional contribution, such as those outside Norway, because it would not account for the fact that cooperation may be organised differently and may vary in scope according to the academic field and context.

8.5 Challenges to the documentation systems

The model poses some new challenges to the documentation systems that until now have been based on the assumption that a one-to-one relationship exists between researcher and publication (and thus have generated statistics that count publications more than once). These challenges include:

- A researcher at one institution must be able to register a publication at another institution.
- Publications affiliated with several institutions must have the same identification number at each institution.
- Co-authors of the same publication should be able to register the publication again after one of them has already registered it.

To resolve these challenges, it will be beneficial for most publications with contributions by authors from several institutions to be included in bibliographic data sources that provide this documentation. Also, the trend in recent years for the institutions to cooperate on common documentation systems, such as FRIDA and Forskdok, will be helpful in this regard.

9 Statistics and point calculation

9.1 Discussion

This is the concluding chapter from the Academic Committee. As such, the committee wishes to make some general comments on the use of publishing statistics as a basis for performance-based funding and to call attention to a problem related to the introduction of a new system of incentives parallel with a new documentation system.

9.2 Funding for publications

In Proposition No. 1 to the Storting (2004-2005), the Ministry of Education and Research states:

The Ministry emphasises that the indicator developed must be useful as a basis for the distribution of funding between the institutions. Consequently, the system will likely need to be relatively coarse in design. It will not be a precise ranking of the individual researcher and associated research findings. The institutions must have internal distribution models that incorporate the incentives further throughout the institution.

The Academic Committee wishes to stress that it is important for the Ministry to inform the institutions of the limitations mentioned here in connection with the indicator that the committee is helping to develop. First, it is vital for the institutions to understand that they will now receive bibliometric data that can be used in other models better adapted to local conditions than the general model presented here, which has been designed to encompass almost all academic fields and institutions in the higher education sector.

Secondly, but equally important, it must be emphasised that bibliometric statistics can only be used for determining research funding at a macro level. Bibliometric statistics cannot replace or simulate qualitative assessments and evaluations related to funding at other levels. To be sure, the new documentation system will have the capacity to uncover previously unnoticed publishing efforts by individual researchers and researcher groups. However, making a leap to allocating all funding resources according to the number of publications from a particular year in the past would be tantamount to disregarding other vital considerations, such as qualitative assessment, a future-oriented research strategy and the responsibility of institutional leadership to take into account the fact that research projects undergo varying phases of activity and inactivity depending on the other tasks the researchers are engaged in, the resources otherwise available at a certain point in time, and the types of projects being conducted.

At the individual level, however, researchers cannot be prevented from focusing more or less on those types of publishing that will count most for the institution in a general funding

scheme. This focus may be more pronounced when the funding scheme is first introduced than after it has been well-integrated.

First, in many academic fields researchers have normally not viewed publishing in relation to anything other than individual publication lists. In contrast, the new documentation system represents an “institutional publication list” to which many researchers contribute – in the same way that many contribute to the content of a common course catalogue. In both cases, the effort of the individual is an element in an organisational whole that he or she plays a part in managing.

Secondly, the degree to which the new funding scheme actually influences the overall framework conditions for research will become clearer with the passage of time. It is questionable whether the effect of the scheme will be so great that the individual researcher will be able to substantially influence the framework conditions through his or her selection of a publication channel. Perhaps the greatest effect of the new funding scheme will be a greater overall focus within the institution on the value of research and academic publishing. In any case, this question should be evaluated after a couple of years. Assuming that such an evaluation will be conducted, the Academic Committee recommends that performance-based funding based on academic publishing be introduced.

9.3 Lack of simulation data

UHR has been charged with the task of laying the foundation for a new funding scheme. It has carried out this task by taking part in the development of a new documentation system in 2004 and by providing recommendations for a system of classification and weighting of academic publications designed to produce reasonable results for the various academic fields and types of institutions in a budget model developed by the Ministry.

Due to the nature of the task, the committee has had to carry out its work with classification and weighting without access to the data that the documentation system will generate. In other words, the committee has worked without statistics from the higher education sector that could show the number of publications per publication type and level or be used to simulate results of alternative methods of weighting. In some cases, the lack of data could be compensated for by using data for Norwegian articles registered by ISI, but in other cases, simulation data was completely lacking.

In the view of the Academic Committee, these limitations do *not* suggest that the recommendations in this report should not be followed. The committee has conducted a thorough review of the potentially unintended effects of the new system for documentation and funding. The opportunity to observe the effects in practice will emerge as the new documentation system begins to generate data. The conclusion is therefore as stated above – that the system should be introduced now and followed up with an evaluation at a later time.