

3.3.1. RESOURCES AND FUNDING

The resource/funding topic group encompasses seven issues.<sup>21</sup> For Denmark, Finland and Iceland we can see a rising trend for funding/resource issues from 2002 onwards but which then declined in 2005/2006. For Iceland and Norway the trend is rather stable until 2004/2005 and reaches its highest level in 2007.

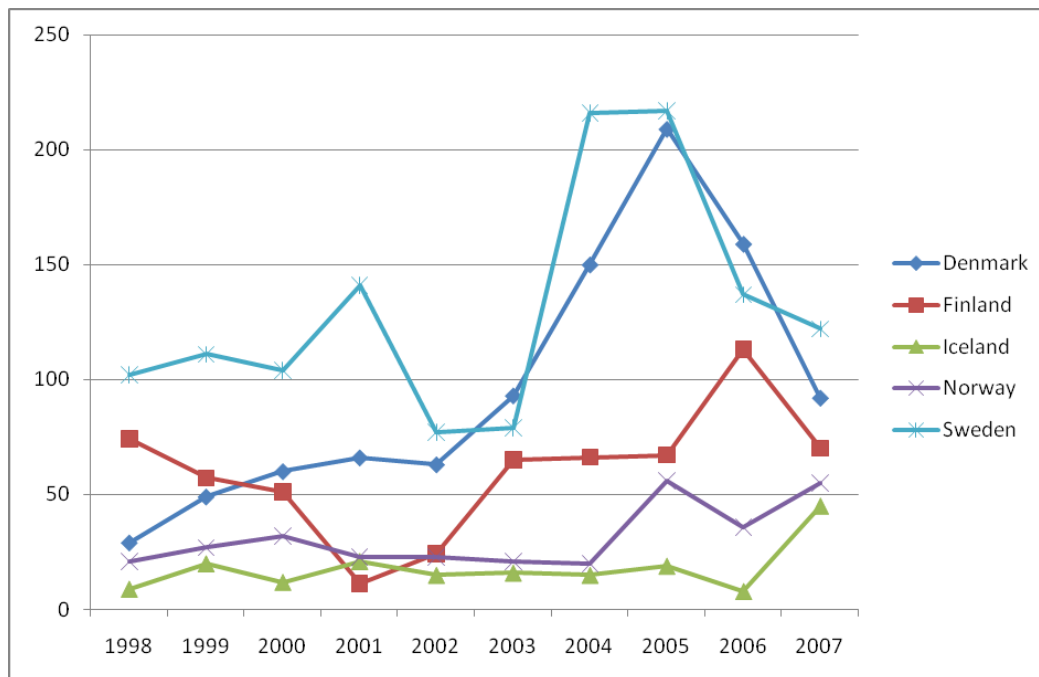


Figure 13.1 Economic issues by country and year (N=3768)

<sup>21</sup> V36 Total national level of financial resources for research (e.g. Percent of GNP)  
 V37 The distribution of financial resources for research on public and private research  
 V38 The distribution of financial resources for research on scientific fields  
 V39 The distribution of financial resources for research on different types of research  
 V40 The prioritization of financial resources for research between different types of research institutions (macro-level)  
 V41 Ways of financing total national research activity (macro-level)  
 V42 Ways of financing different types of research institutions/specific themes (macro-level)  
 V43 Different models for financing research (including different funds)

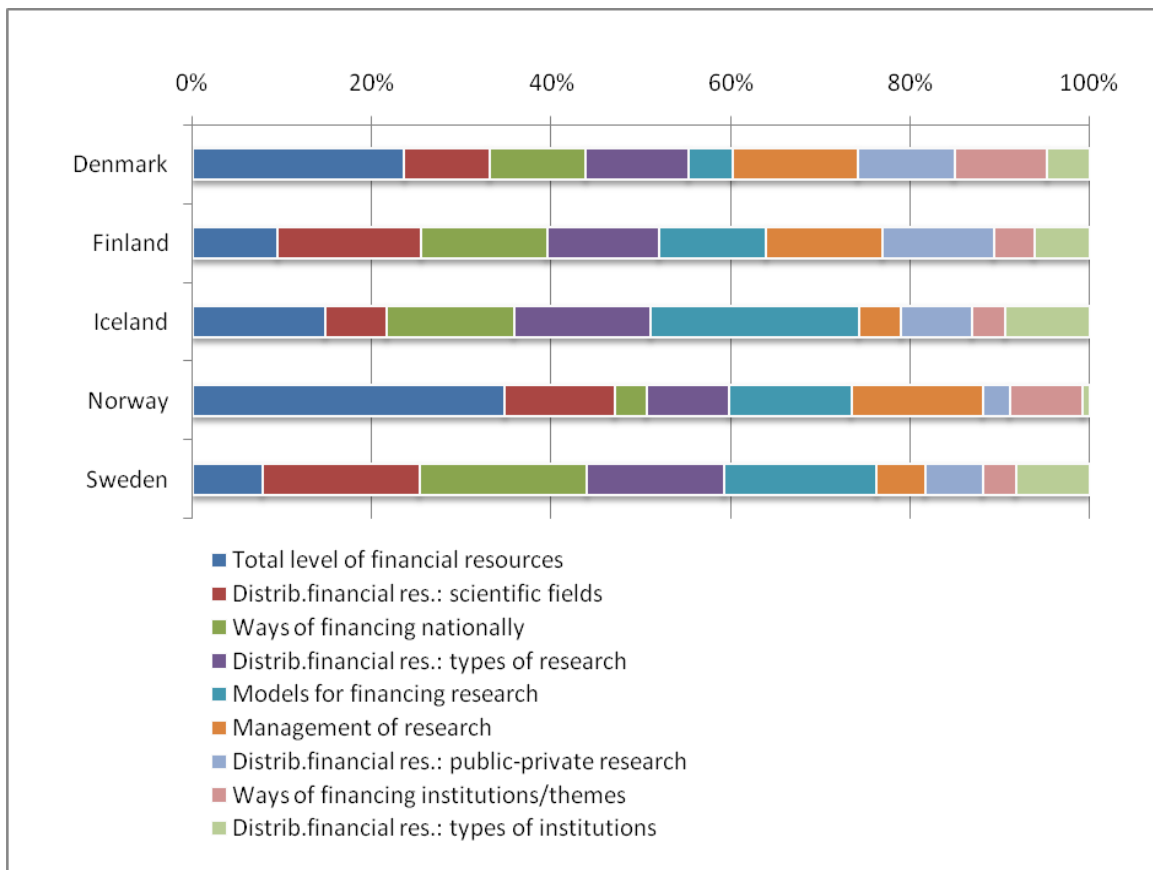


Figure 13.2 Economic issues by country and sub-themes (N=3768)

In Figure 13.2 the relative prevalence of the different financial/resource issues is indicated for each of the Nordic countries, enabling comparisons between countries for the whole 10 year period.

#### Denmark

In Denmark economic issues became an increasingly important topic on the public agenda until 2006 when concerns about economy declined somewhat in Denmark. The concern is primarily about the total level of national funding. Many actors were involved in this debate which put the Minister of Science, Helge Sander, under pressure to find more money for Danish universities. A regular debate has taken place about the political goal, stated and repeated by the Minister of Science every year since 2003, to reach the so-called Barcelona target of 1% of GDP to be invested in public funding. Much of the debate in Denmark focused on how far or how close Denmark was to this 1%. The Minister of Finance participated in that debate, as did several journalists, university leaders and individual researchers. In this the debate Denmark was frequently compared to Sweden and Finland.

#### Finland

Principles of funding have been the subject of debate over time in Finland, especially in 1998 and 2007. The distribution of resources by the Academy of Finland has provoked critical comments that question the role of the Academy, and proposals to change the status of the Academy. Accusations were made that the Academy and its committees have favoured certain circles and groups of researchers when allocating funds. The debate has been broad and covered topics such as the overall shortage of money in the universities and the one-sided funding policy of the Academy after it had started promoting the Centres of Excellence. Concerns were voiced that its funding principles would lead to unnecessary polarization between researchers by labelling some researchers as “top” researchers and others as “mediocre”.

A somewhat frequent subject in the public debate has been R&D expenditure as a share of GDP. Even though the high levels of R&D investments in Finland are usually taken as an example of success, there were critical voices in the public debate starting already in 1999. State funding had been cut in all sectors and savings were made in the early 1990s which created a deficit in funding as some writers claimed. In addition it was argued in the debate that the state's investments in R&D have not substantially increased. Furthermore, criticism has been directed at the fragmentation of research funding. In 2002 and 2003 it became clear that there was dissatisfaction with investments in R&D, especially with the relation between public and private investments in R&D. One reason for the accelerated public debate was the difficulties experienced by technology companies who had to fire employees as global competition caused a shift of jobs to low cost countries. The new government programme was criticized and commented by the editorials in *Kauppalehti* (2003-03-14 and 2003-04-30), stating that Prime Minister Lipponen's second government has left the R&D investments on the shoulders of private companies.

#### Iceland

Financial issues were important in the Icelandic debate. The structure of the financial system was frequently discussed, and increasingly so during the period. Iceland at this time was among the top five OECD nations in terms of overall R&D expenditure, and at the very top as concerns public funding of R&D. A prominent issue in this discussion was how to distribute public funds. Historically, Icelandic public organisations have been allocated a block amount to finance R&D activities, leaving to the organisations themselves to decide on the use of these funds. By increasing the competitive research funds, applicants were increasingly required to compete for financial support. Some claimed that this would harm basic research, while others saw this as an appropriate way to allocate public funds. Articles about lack of funding for either research and development or for innovation were also common. According to some, lack of funding of R&D in emerging fields could delay the possibility to exploit the opportunities of these fields.

#### Norway

Resource issues in general and overall levels of research funding in particular were at the core of the debate in Norway throughout the period. Sixty percent of all articles touched upon at least one resource issue, and one-third of all articles addressed resource level issues.

In 1999 Norway set the target to raise the overall level of R&D resources as proportion of GDP to "the average of the OECD countries", which at the time meant increasing the level from 1.7 to 2.3 percent of GDP. In 2005, the target was aligned with the EU Barcelona target and raised to 3 percent. While these formal targets made the overall level of research funding a core issue of research policy throughout the period, the debate on the insufficient funding and poor conditions for research in Norway predated them by far. The public debate may be seen to have exerted a pressure on the policy-making process, and contributed to its adoption. The issue of insufficient funding was initially most strongly voiced by medical researchers. The inferior position of Norwegian research and research funding compared to its Scandinavian neighbours is a rhetorical figure that pervades the debate on the resource issue throughout the period. The adoption of the targets has created a basis for depicting Norwegian research as deficient, and of Norwegian research policy as complacent, where other countries have taken up the challenge. The arguments about the low level of funding in Norway have been voiced particularly vocally by academic professionals and address, often implicitly but sometime also explicitly, university or basic research in particular. The coordinated campaign of universities for more funding on the basis of arguments drawn from the GDP indicators and targets culminated in a common statement by the six university rectors in July 2007. This statement is part of the general reactions among universities to the weak appropriation in the 2007 budget, including a cut in the core funding part of universities budgets, justified by the minister as a temporary pause in the promised growth of university funding. By using the term "hvileskjær"<sup>22</sup> to justify and emphasize the temporary nature of the cuts, he inadvertently provided his (university) critics with a term incorporating strong rhetorical impact to characterize what they saw as the

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<sup>22</sup> Untranslatable term from speed skating, denoting a brief rest or pause in the even rhythm of the skater's glide.

overall failure of his (funding) policy. The term became stuck as a rallying call for this criticism, and contributed no doubt to the overall impression of his failure, leading to his resignation in the autumn of 2007. The general political consensus on both the 1999 and the 2005 GDP targets gave them a status as practically above critical debate, and just a few gave voice to skepticism and criticism. The most notable exception was one of the editors of *Dagens Näringsliv* who wrote several, sometimes harshly critical, leaders and editorial comments (nine in our material) on what he saw as an unrealistic and superfluous target.

## Sweden

Economic issues were very high on the agenda in the Swedish debate already in the beginning of the period. They became particularly intensively debated in 2004 and 2005, and dropped somewhat surprisingly in 2006 and 2007. One possible explanation for this was the change of government; another might be a “wait and see” attitude towards the outcomes of the Brändström Resource Inquiry.

One major controversy in Sweden on funding levels took place in 2004 when a number of prominent actors joined forces and criticised the government. The SUHF, the Swedish Research Council, Vinnova, the Royal Academy of Sciences and the Royal Academy of Engineering Sciences signed an article which spelled out how direct state funding had decreased over a number of years. The driving force in this debate was the vice-chancellor at Uppsala University, Bo Sundqvist. When the article was not responded to, he followed up with a new article in *Svenska Dagbladet* (2004-06-23), claiming that “Swedish Research is under Threat”. Preceding this campaign, the government had described Swedish funding of R&D as being at “historically high levels”. Minister of education, Thomas Östros, declared that “No other OECD country allocates as much money to research”. The funding issues were also commented by other actors in an article in *Uppsala Nya Tidning* (2004-11-30) written by institutional leaders from SLU (Swedish University of Agricultural Sciences).

Interestingly, the under-funding has also triggered comments from the opposition parties. “We are not responsible” (SvD 2003-07-05) was the heading of an article written by representatives from the Moderaterna. Also a Kristdemokraterna politician (SvD 2002-09-01) said that the rationalization processes in education and research were a threat to quality. The DN editor wrote that the government parties once again deceived research, and consequently lacked interest in their own future (DN 2004-09-12).

In 2006, the new government promised massive investment in research. However, the budget presented in 2007 did not impress university professors. The funding increases “were hopelessly insufficient and do not turn the negative trend” claimed Vinnova, IVA and Volvo and others in SvD (2007-10-17). While public investments in research are decreasing, industry makes the most out of them. The authors urged that public research funds be raised to at least 1 percent of GDP.

During the election campaign, the Alliance parties had promised an increase of research money to 1 percent of GDP, and they were often reminded of that fact, for instance by academics union leader, Anna Ekström: “Fulfill the one percent target” in UNT (2007-09-19). However, one journalist wrote an article about “the curse of the one percent target”. Research is swept in a cross-political benevolence; everybody assures its importance but nobody is prepared to pay for it (*Expressen* 2007-04-12).

Over the years there has been growing discussion about the balance between direct state funding and competitive funding allocated, for instance, by research councils. Some strong professors, especially at Uppsala University, such as Sverker Gustavsson (DN 2000-01-11), Li Bennich-Björkman (UNT 2003-03-30) and Tore Frängsmyr (SvD 2001-01-03; 2006-06-09) have argued for more direct money to higher education institutions. Professor Håkan Eriksson claimed that increasing dependence on external funding leads to universities losing their souls (SvD 2002-10-21). One of rather few defenders of external funding has been Sverker Sörlin: “Researchers have to motivate their funds” he wrote in DN 2005-05-24.

The peer review processes have been criticized above all by individual researchers. One main issue has been the time-consuming aspects of external funding. Other aspects have included the ethical sides of peer review.

One of the most frequent debaters on this issue has been Professor Bo Rothstein at Gothenburg University. On a couple of occasions he has attacked, what he considers, a flawed and corrupt system. "Swedish Research is run by Social democrat commissars" he wrote for instance in DN (2006-06-05). In the article, several funding bodies and agencies were pointed to as being run by people with close connections to the social democratic party. Furthermore, he argued in another DN debate article that the government politicised the entire Swedish research system (DN 2005-05-08).

Increasingly, there have been arguments for more performance-based funding system in Sweden. Actually, that was one of the promises the right wing and liberal parties made before the last election in 2006. More money should be allocated directly to higher education institutions, but based on the results of ex-post quality reviews (DN 2005-04-06). The new research policy should be based upon quality, freedom for institutions, strong basic research and innovation. In fact, it was the former government which launched the so-called Resource Inquiry, whose task was to reform the Swedish research funding system. They presented their results in late 2007. In brief, they proposed a new cyclic ex-post evaluation system for both education and research. Clearly, the British RAE has been the model inspiring the inquiry. The recommendations made by the committee on the research funding system are still discussed, not least the bibliometric methods to be used. The consequences will be fundamental for the system.

### 3.3.2. ORGANISATION, INSTITUTIONS AND REFORM

The organisational topic consists of eight issues ranging from institutional structures/system reforms to quality/excellence versus relevance/application of research.<sup>23</sup>

For Denmark and Finland we observe a rising trend for organisational issues from 2001 until 2006. On the other hand, organisational issues show a quite unstable and fluctuating trend in Norway and Sweden while for Iceland there are small variations on the prevalence of these issues during the ten year period.

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<sup>23</sup> The full list of organisational issues:

- V44 Institutional structures/systems reforms related to research
- V45 Management of research, including management tools at the level of institutes
- V46 Research based services for governmental authorities.
- V47 Cross-disciplinary research
- V48 Research and the business sector
- V49 Need-/policy driven versus researcher driven research
- V50 Quality/excellence versus relevance/application of research
- V51 Infrastructure of scientific research

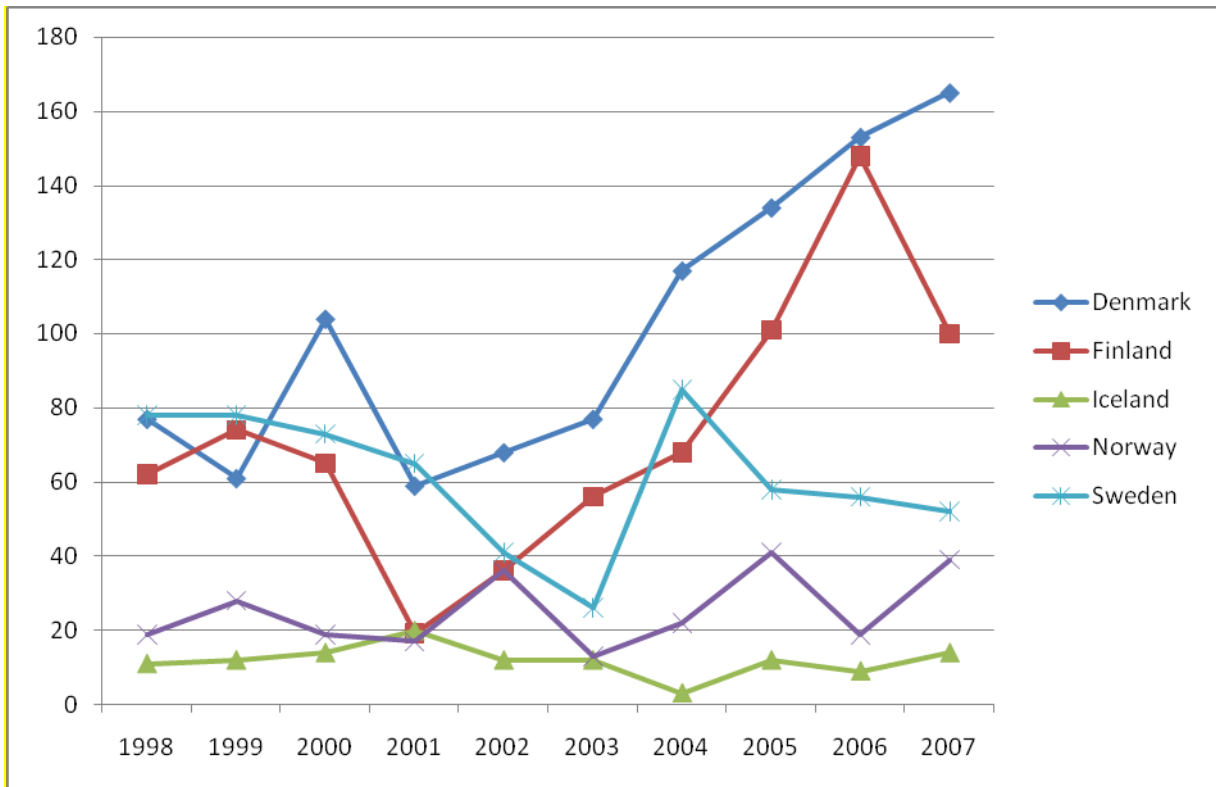


Figure 14.1 Organisational issues by country and year (N=3768):

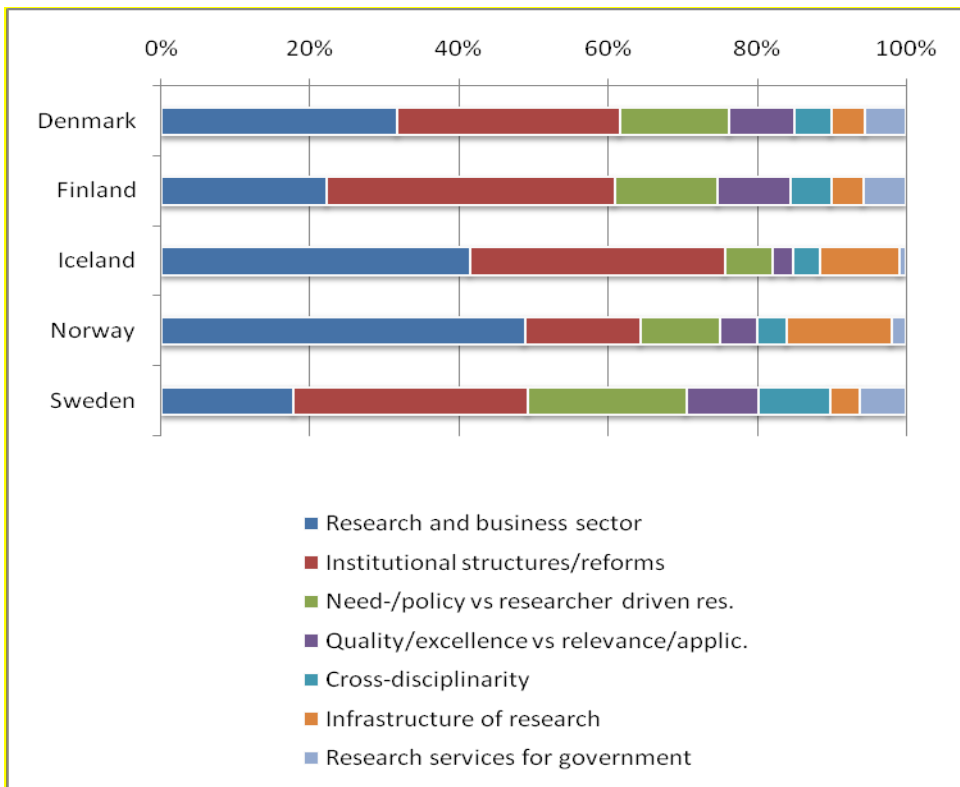


Figure 14.2: Organisational issue by country and sub-topic (N=2348)

## Denmark

Organisational issues figure very frequently on the public agenda in the Danish debate. The political initiatives that set the agenda started in 2001, focusing in particular on governmental research institutes. In 2003 it was the new University Act, in 2004 the change in the law for governmental research institutes, following which some institutes were incorporated into universities, and in 2006 the political announcement of mergers between universities and governmental research institutes. *Organisational* issues were in focus in the media in Denmark with more than 60 articles in the public debate every year since 1998. In the beginning of the period the Danish research institutes awaited the conclusions from the committee organised in 1999 and later the issue reached a peak with more than 160 articles in 2007. The majority of these were triggered by political statements, either from commissions or directly by Government/the Minister of Science.

The main rationale for reorganisation was efficiency, and to enhance contact between all parts of public research. Quality of research is also referred to in these communications, but not as main argument in any of them. Almost all the above-mentioned initiatives met with resistance from researchers, often expressing fears that the freedom of researchers would suffer. Reactions to these structural reforms came primarily from researchers working in these institutions.

Cooperation between the public research sector and the private business sector attracted quite a number of opinions, not the least from Danish Industry and others representing private business, such as the organisation for trade and service (Handel og Service).

Policy-driven research was on the agenda as well, similar to that which took place in Finland, but not to the same extent as in Sweden. Services for government were an issue connected to the discussions about structural reforms of the governmental research institutes.

## Finland

Organisational issues have played an increasing role in the Finnish debate following pressure to centralize the higher education system and especially the universities. The debate increased substantially after the Prime Minister's Office commenced a project "Finland in a Global Economy" and produced a report in 2004 which proposed to increase the share of competitive funding of the universities as well as their financial autonomy. The report called for more specialization in order to form larger networks between research groups. In 2005 the government made a decision in principle on the structural development of the research system, and assigned the task of clarifying the effects on the research system to the Academy of Finland and Tekes (the Finnish Funding Agency for Technology and Innovation).

The debate in Finland on the need of structural reforms is apparent, and to some extent overlaps the issues of globalisation. The expansion of the university system has become a core issue in the debate as the role of universities is being reconsidered. The whole research system was debated in 2006 when the discussion on the resources and goals of research heated up. This was connected to the increasing debate on the innovation system and the role of research and universities associated with this. Some have pointed to the tensions between research and innovation policy goals since the production of innovations, and commercialisation of research results have been increasingly emphasized.

In addition to the need to carry out research in relevant fields, there has been a debate on which disciplines should be fostered in order to gain competitive advantages in global markets. One solution has been the merger of three universities that are said to represent the potential needed in the future. The so-called "innovation university" (now known as Aalto University) is a merger of Helsinki Business School, Helsinki University of Arts and Design, and Helsinki University of Technology. It was set up quite quickly and there was a strong push from the industry and business sector to support this new university. The government made a resolution to establish the university in 2007 but the idea was first introduced by the rector of Helsinki University of Arts and Design in 2005. The idea was received with mixed feelings in the public debate and

triggered off deliberations about the need for a Finnish “top-university”. Those in favour of the merger saw it as a step towards top research and international prestige, but the opponents claimed that it would diminish the autonomy of the universities and diminish the quality of research.

#### Iceland

A growing discussion of organisational matters related to the research and innovation system can be noted. The former Research Council and the new Science and Technology Policy Council discussed the role of research organisations, taking into account OECD work in that area. The role of research organisations and of universities in research and development were discussed. During this period a considerable number of mergers between research organisations took place, as did various kinds of mergers between public organisations, universities and even R&D-performing firms.

#### Norway

The period saw extensive reforms and reorganisation within the research system. One was the so-called “quality reform” of higher education institutions which was an issue on the policy agenda throughout most of the period – first with its preparation with the Mjøøs and Ryssdal commissions, its formal implementation from 2003, and its taking full effect during the following years. This process triggered much debate, but its focus was almost exclusively on governance issues and on the educational parts of the higher education institutions activities, not on research. Hence, only a part of this emerges in our material on research policy, even if arguably it did implicitly affect research. During the latter part of the period the emphasis shifted towards research, which is captured in our material. This debate combines several separate issues, including such issues as the position of free research, in particular the shrinking resource base for free, researcher-initiated academic research, but also the issue of the need for a formal legal protection of academic freedom (see Human Resources below), and the so-called “tellekantsystemet” (see the Output section below).

The other major issue of reform/reorganisation was the evaluation and subsequent reorganisation of the Research Council of Norway. The debate triggered by this process overlapped with issues concerning the reform of higher education institutions in the debate about the relationship between the council and the universities, something which has been a recurrent organisational topic in Norwegian debate throughout the period. While the tensions between these institutions have surfaced in the policy process and public debates on research policy for decades, it resurfaced at the beginning of our period through a relatively harsh response by the rector of University of Oslo to criticism of the quality and effectiveness of university research (“For mye “mosjonsforskning” i Norge” (*Aftenposten* 16.4.98 – 4079) voiced by the director of the Research Council. According to the RCN director, universities do too little to stimulate the quality of research. According to his university opponents, however, the universities are, under-funded, and the council itself is too bureaucratic and does not, through its numerous steering schemes respect to sufficient extent the autonomy of basic research. It is again academic medical researchers who voiced strong criticism of the RCN, and claim at one point that they see a “cultural clash” (“kulturkollisjon”, *Aftenposten* 31.8.99 – 4361) between the universities and the council.

A strong “elitist” trend gained hegemony within both policy and public debate during this period, as seen by the implementation of a large number of “elite” schemes, including centres of excellence, centres for research-based innovation, and a scheme for generous support of the very best young researchers. We find in the record of the debate several statements that supported and justified these schemes, many by the responsible minister and Research Council officials. We find very few voices which opposed this new, saliently “elitist” thrust – often explicitly justified in that very term – of Norwegian research policies that gained momentum during the early 2000s.

The data for Norway show a strong presence of articles that in some way or another touch upon issues pertaining to public/private research relationships. While this should not be taken to indicate that such issues



were primary in debates to the extent that the distribution in Figure 14.2 suggests,<sup>24</sup> it does indicate a pervasive awareness of these issues, also in debates that were primarily about other issues. This may provide an indirect indication that issues related to private research, commercialisation and innovation had a stronger presence in the debate than a picture based only upon main topics might indicate.

#### Sweden

Increasingly, the structure of the Swedish research landscape has become an issue in public debate, following a long period of expansion of the system. There are, however, articles in the media debate that claim that resources are spread too thinly, and too many poor and mediocre research environments were funded (DN 2004-12-22). One important article, showing a shift in focus, was written by minister of education, Leif Pagrotsky, in DN (2004-04-12): "Government stops new universities". Expansion of the sector and promotion of institutions had come to an end. This was obviously bad news for those university colleges who had an ambition to reach full university status, for instance Malmö högskola and Södertörns högskola.

University chancellor Anders Flodström's proposal to reduce the number of universities to five also resulted in some discussion in the press. Three vice-chancellors in the south east of Sweden declared that they were "sick and tired of sweeping arguments of research money spread too thinly". Their own argument was to create a strategic alliance between the three institutions. An elite institution, they argued, was feasible and interesting, but there was also a need for other universities. There are, however, not many articles defending further expansion of the sector. Hence, there has been an elitist turn in the sector without much controversy. This does not necessarily indicate that there is consensus on this in the sector, but it is not easy to oppose the rhetoric on higher quality, world class, excellence (who would defend less than excellent research?)

There are a number of articles which actually deal with fundamental issues in the sector. One theme is the role division between higher education institutions and other knowledge producers, for example, the essence of academic research. Other themes include academic freedom and integrity. Universities must stand up for their academic integrity. Short term, opportunistic behaviour is a serious threat to academic values (*Sydsvenska Dagbladet* 2004-03-12). In an article in UNT in 2003 (06-10), a number of leaders of higher education institutions vented their frustration. High quality of both research and education was considered difficult to maintain. Less money per student, weaker teaching research links, too much external funding and non autonomous universities were serious threats to quality.

Many of the issues included in this theme in Sweden are related to different modes of research. This could be related to different actors in the system. Firstly, all the calls for more basic research – a core university function, are expressed by a number of actors. However, researchers at higher education institutions are represented in most of these. Professors (mostly) could either act individually or from another platform, such as SUHF (The Association of Swedish Higher Education), the Royal Academy of Sciences, or the Swedish Research Council.

On the other side, we find the "innovation lobby" (Benner 2008). The frontrunners are The Royal Academy of Engineering Sciences (IVA), often in strong alliance with the Swedish Innovation Agency (Vinnova). Other actors include the unions and the employer organisations, such as Civilingenjöröförbundet and Svenskt Näringsliv (Confederation of Swedish Enterprise).

#### 3.3.3. HUMAN RESOURCES

The human resources topic comprises seven issues. The issues include items such as recruitment and education of researchers as well as research ethics/integrity and gender equality.<sup>25</sup>

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<sup>24</sup> The coding does not distinguish between primary and secondary topics, only if a topic is present or not. There are indications of a somewhat lower threshold in the Norwegian coding the presence or not of this variable in the articles.

<sup>25</sup> The full list of topics in the human resources category is:

For Denmark, Finland and Iceland we can see a rising trend for human resource issues from 2001 until 2006. Then this topic suddenly drops in Finland while continuing with reinforced strength in Denmark. On the other hand, human resources issues exhibit a quite unstable and fluctuating trend in Norway and Sweden while for Iceland there are small variations on the prevalence of these issues during the ten year period.

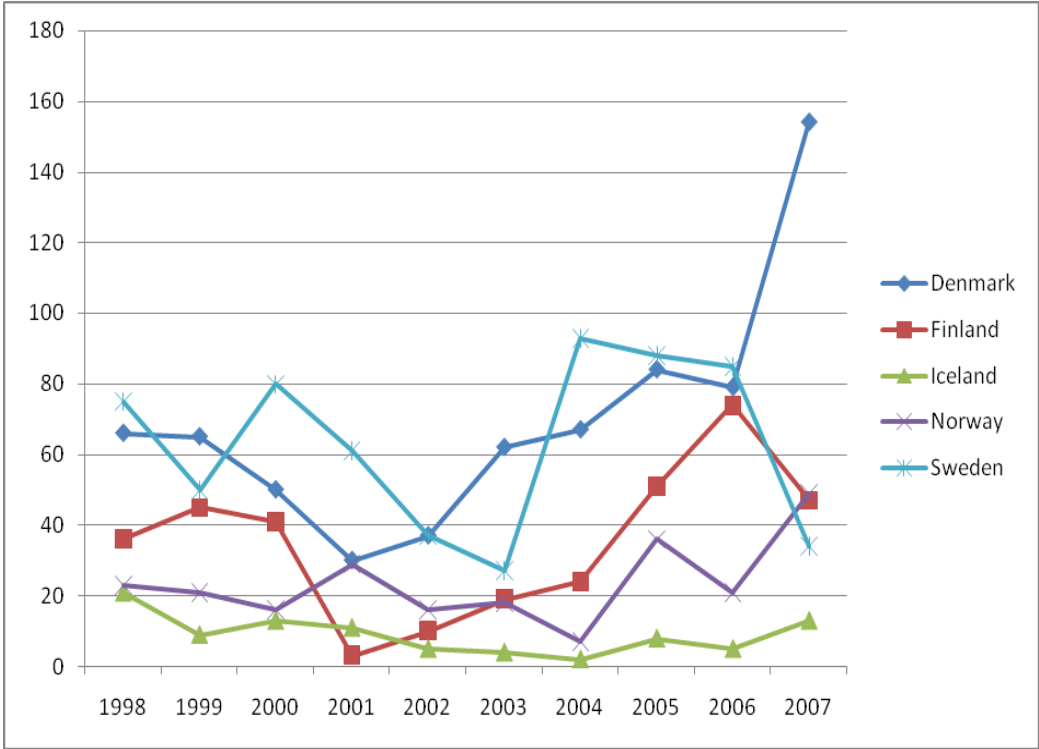


Figure 15.1 Human Resources by country and year (N=2322)

- V52 Recruitment and education of researchers
- V53 Salary and working conditions of researchers (e.g. degree of permanent tenure)
- V54 Mobility of researchers
- V55 Academic freedom/autonomy of research
- V56 Collegial influence for researchers
- V57 Research ethics/research integrity
- V58 Gender equality

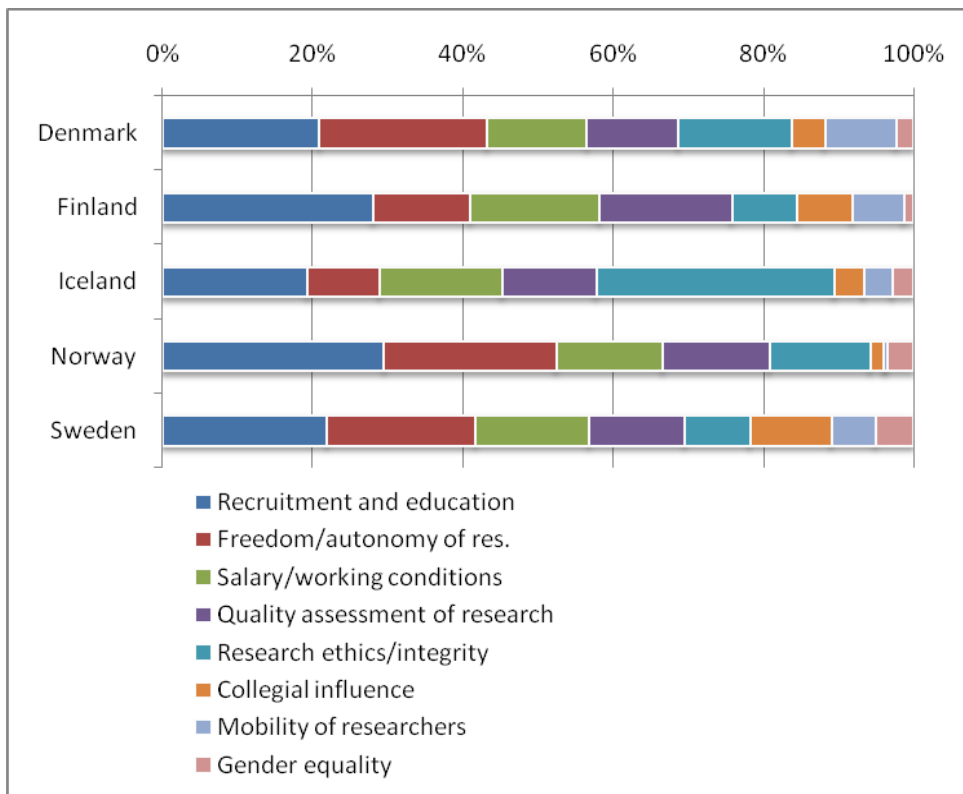


Figure 15.2: Human Resources by country and sub-topic (N=2322)

#### Denmark

Human resources issues, and especially recruitment and education of researchers were already high on the Danish policy agenda at the end of the 1990s, and were in particular top items on the agenda in 2004, 2005 and 2006. The issue is of great interest to many actors, and was a key issue in the Globalisation Council formed by the government in 2005. Human resources, especially education and training of new scientists, were therefore central issues in the April 2006 report from the Council. This remained high on the agenda in 2007 since the agreed increase in additional resources for human resources and more researcher-training was distributed that year. The debate increasingly turned into one on academic freedom and autonomy of research, which explains the very high level of hits on this topic group (see Figure 15.2).

#### Finland

Even though human resource issues are not the most dominant theme in the debate, this has evoked critical views and strong opinions whenever it arises. Some of these issues are connected to structural reforms such as the reformation of the financial and administrative status of universities in 2007. Much of the debate continued after the study period, although some of it began earlier. There have been references to the appointment principles of professors (HS 1999-05-29) as well as to the workload of professors when funding has become more competitive. Basically, this has meant that professors have had to use an excessive amount of their time in finding funding and undertaking administrative tasks, rather than carrying out research or supervising students.

One specific issue that raised critical voices was the new payroll system in the universities (HS 2006-12-08). The new system was to be more performance-based and linked to personal evaluation. The system was largely opposed by the researchers because it was said to curtail freedom and create more bureaucracy in the universities (HS 2005-04-05).

Other HR issues have been connected to the overall conditions of employment. The wage level of university employees has lagged behind and there has been an increasing use of short-term or temporary contracts (TS 2007-09-02). The European Union Year declared 2005 as the Year of the Researcher. The Academy of Finland promoted the academic career of researchers by organizing campaigns to get more young people interested in research. However, this was met with critical views as researchers complained about the poor employment conditions and salaries (HS 2005-09-03 and HS 2006-12-07).

#### Iceland

Ethical issues were more frequently discussed in the debate of research and development in Iceland than in the other Nordic countries. A large number of ethical questions were raised during the debate of the Health database of deCode Genetics. This topic has remained high on the public research policy agenda even though the content has shifted to other concerns. The other issue prominent in the Icelandic case was the debate around salaries and working condition of researchers. During this period an increase in doctoral education and enrolment occurred. Icelanders have traditionally gone abroad to study at foreign universities, especially for Masters and PhD degrees, but in recent years the supply in Iceland for these kinds of studies has increased dramatically.

#### Norway

Figure 13.2. illustrates that research recruitment and education issues played a larger part in human resource matters in Norway than in the other countries. This topic, as so many others, is closely linked to the debates about resources for university research in particular. This debate was to a large extent about insufficient recruitment of researchers, in particular within science and engineering, and about the (in)effectiveness of research education. Throughout the period ambitious quantitative targets were set for new PhDs and new research education positions. Any failure to reach those targets in annual budget appropriations provided occasion for public criticism of the allegedly inadequate funding policies.

While there are few examples where the autonomy of research (academic freedom, “free research”) is the main topic, the importance of this issue is more strongly indicated by being referred to pervasively, without being the only/main topic. About one-fifth of all articles have some reference to this type of issue. It is, for example, a key part of the debate on the funding of basic research and on the relationship between universities and the research council.

#### Sweden

HR issues were discussed throughout the period in Sweden. General discontent with working conditions for academic staff was expressed by researchers themselves as well as by the influential Union for University Teachers (SULF). At the system level, one journalist raised the question in DN: “Long education, high debts, low salaries, tough working conditions – is it really a priority to put more souls on the academic ghost ship” (2004-08-17).

During the first year of this study, 1998, a bill on doctoral training was launched, with the main aim of improving working conditions for students. The state also wanted to make doctoral training less time-consuming and more effective. The bill was intensely debated in Swedish media. The strongest protests came from scholars in the social science and humanities, claiming that this reform would more or less be the demise of many research environments. “Government policy creates a crisis at Humanities Faculties”, a number of doctoral students at Uppsala University wrote (UNT 1998-04-05). The Liberal party (Folkpartiet) defended the old order, with a more flexible admission policy while the new Minister of Education, Thomas Östros, referred to the old system as cynical and exploitative.

At this time, Carl Tham was minister of education. In 1999 he launched the so-called promotion reform which was another controversial issue with a strong impact on the Swedish academic staff structure. Another provocative issue was a 2004 committee report on doctoral training. This declared that in future, disciplines

would no longer be the primary base for knowledge production, which was a provocative statement for professors in the well-established disciplines. The recommendation to make doctoral training three years instead of years was regarded by some, for instance professor Bo Rothstein, as a serious threat to Sweden's international reputation and quality of doctoral theses (DN 2004-05-15).

Increasingly, as the output of doctors reached a historically high level, concern with the situation for early career academics has become pervasive. Too many researchers go abroad, in particular to the USA, where career prospects are regarded as more favourable. The Swedish/European system is characterized by apprenticeship, disciplinary conflict, nepotism and inertia. The lack of mobility endangers the Swedish system. One radical solution suggested was to create posts at higher education institutions for non-Swedes only (DN 2005-12-10).

In 2000, 125 researchers signed an article which focused on the poor working conditions for young researchers in Sweden. The career system needed a thorough restructuring, they argued: a whole generation of researchers is moving to other countries, due to insecure working conditions, poor salaries and lack of funding opportunities (see also DN Debate 2004-09-12). Head of editorial at DN called the current research HR policy a "proletarianization of researchers" (DN 2006-03-19).

An article on human resources, but also on the research landscape, by a professor at Karolinska Institute stated that "It is meaningless to appoint new professors in Karlstad, Örebro and Växjö, and to make senior lecturers professors". The promoted professors cause inflation in the career system, so there should be fewer professors than today (DN 1998-07-17). A state committee report proposed a new academic career system, "Karriär för kvalitet" (SOU 2007:98), inspired by the US tenure track system. This has not, however, caused much debate so far.

#### 3.3.4. OUTPUT ISSUES

The output topic consists of eleven issues ranging from quality assessments to patents.<sup>26</sup>

Denmark and Finland exhibit a rising trend for output issues from 2001 until 2004/2005. Output issues show an unstable and fluctuating trend in Denmark, Iceland and Sweden in particular during the ten year period. In addition these issues were far less frequently taken up in the debate in Norway and Iceland than in the other countries.

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<sup>26</sup> The full list of topics in the output category:

- V59 Quality assessment of research (including methods and indicators)
- V60 Assessment of productivity of researchers (including methods and indicators)
- V61 Ranking of research institutions (including criteria)
- V62 Research based education
- V63 Communication of research results
- V64 Developmental work, patents
- V65 Innovation
- V66 Research and small-/medium-sized enterprises
- V67 Research and international competitiveness/productivity at a national economic level
- V68 Returns from research/societal utility
- V69 Citizens and research

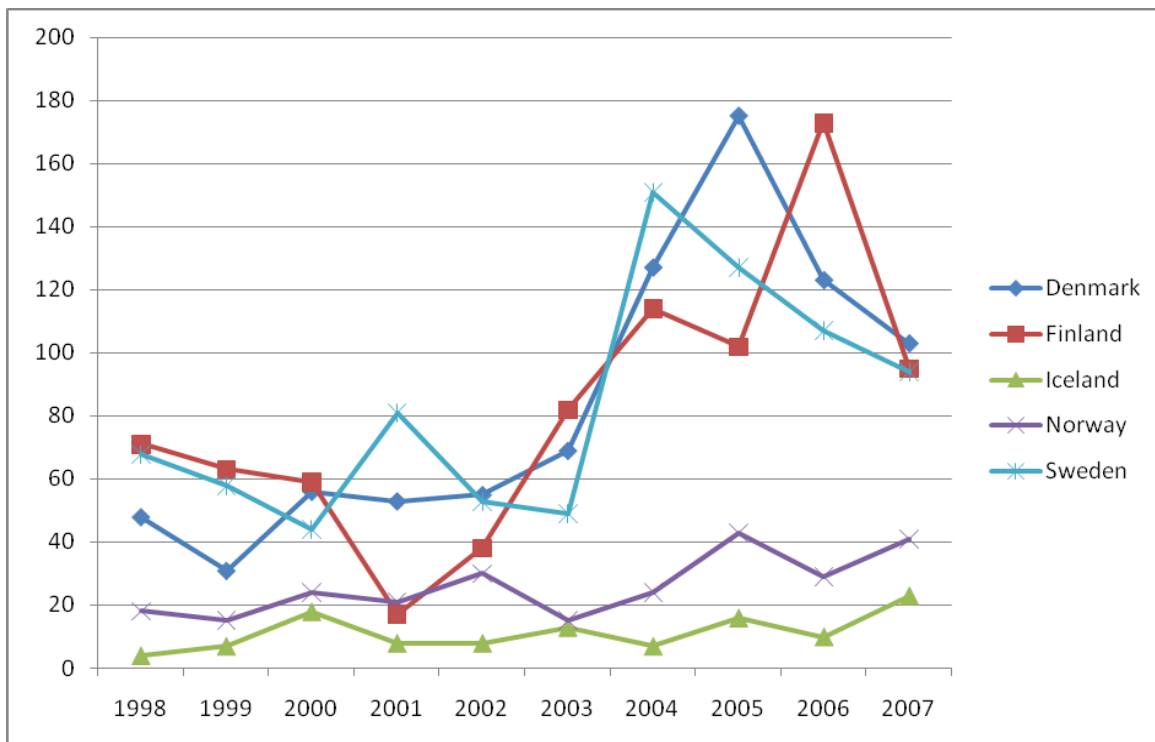


Figure 16.1: Output-related issues by country and year (N=2553)

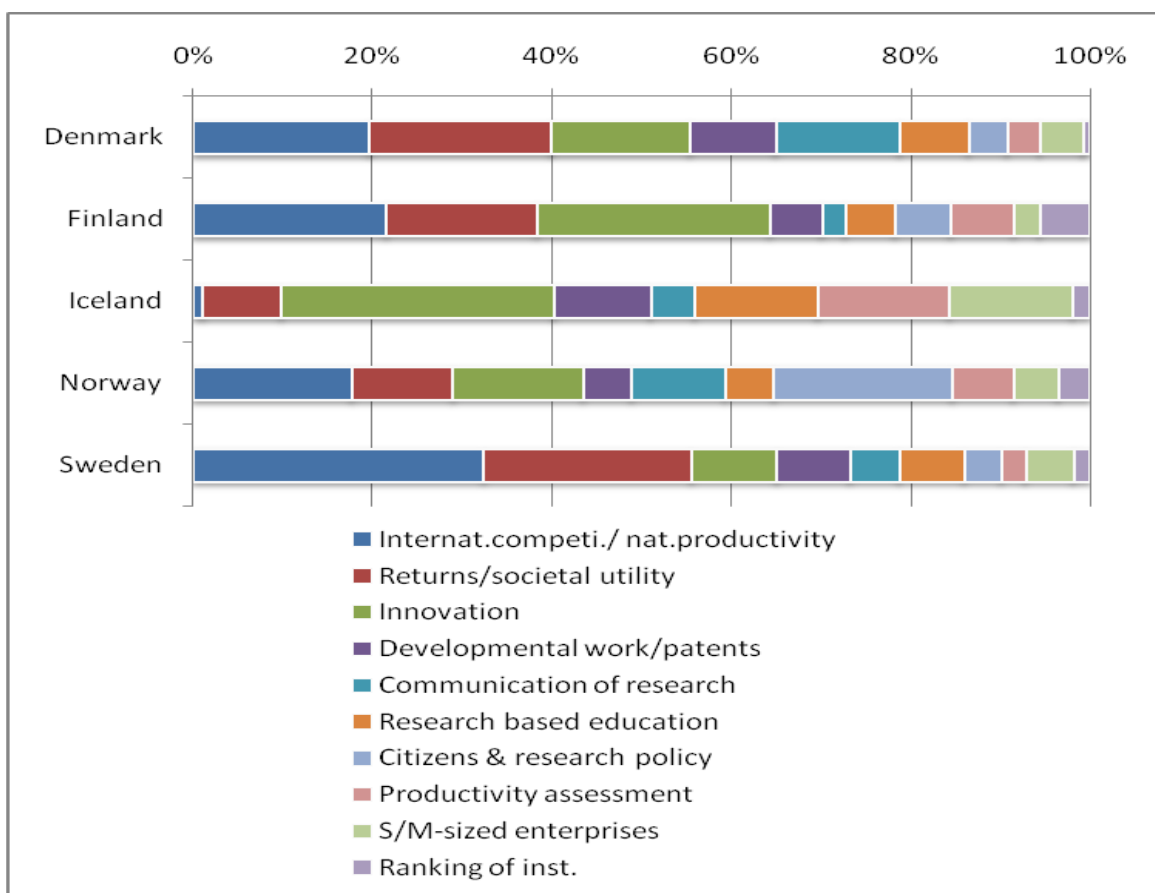


Figure 16.2 Output-related issues by country and sub-topic (N=2553)

## Denmark

Output-related issues were increasingly taken up in research policy debate in Denmark from 1998 to 2005. The change in government in 2001 increased the focus on this aspect, partly triggered by a new action plan in 2003 from Helge Sander, who became Minister of Science, Innovation and Technology in 2001. The publication of this action plan, promoting closer cooperation between universities and the private sector, is the main explanation of the frequency of the societal utility category in Danish debate at this time.

Innovation during the ten-year period is not a theme that is as salient in the public debate as it was in Iceland and Finland. This, despite the fact that Denmark may be seen to perform strongly on innovation policy, and given the many initiatives that have been taken that relate to innovation (see Pro-Inno Europe Trend Chart). Innovation has increasingly become a central element on the agenda for research policy.

## Finland

Output-related issues were the dominant theme in the Finnish debate during the period, and increase at a time when the debate peaked in 2006. This is connected to the debate about the structure of the university system and the new role of universities. The debate at that time revolved around innovation due to the absorption of science and technology policies into innovation policy. There is an increase in innovation-related debate in 2003 which continues steadily and peaks in 2006, when three-fifths of all articles address this issue. Some of the articles use innovation only as a rhetorical tool, but nevertheless there is a strong connection between research, innovation and national competitiveness.

Whenever the innovation system is addressed, universities and research are considered to be vital elements. However, criticism is addressed at the education and research system for favouring quantity over quality. This is especially related to mathematics and technical sciences where resources for teaching and basic research are allegedly weak (KL 2006-01-20). International competitiveness became topical during 2003–2006, and there is a strong tendency to see innovation as a key factor in promoting global competitiveness and supporting the national economy. Concerning the returns from research or societal utility, the debate seems to have been somewhat topical during 1998–2000, but declined thereafter, re-emerging in 2003 since when it is addressed just occasionally.

Another issue closely related to innovation and competitiveness is the incapacity of universities and companies to develop products and commercialise them. There are frequent proposals to establish a national programme for promoting business know-how and studies within business and marketing (HS 2000-04-14, KL 2002-02-20 and KL 2003-01-15). The fact that output-related issues dominate the debate can be seen as the need for strengthening the national economy, especially since the ICT-sector has proved to be unable to create the competitive advantage it was assumed to have.

## Iceland

While Icelandic research policy has been strongly focused on input issues, the debate in recent years has shifted towards output, with a considerable increase in concern for innovation and the need for support of new knowledge-based firms. The need to broaden the industrial base has been focused and innovation is seen as essential for that development. The discussion about small and medium-sized firms has increased. Lack of financing of start-up firms has been criticized. Knowledge-based firms have started a forum within the boundaries of the Confederation of Icelandic industries, the members of which have taken an active part in the debate. Debate on research-based education has increased in recent years with expanded opportunities for studying for Masters and PhD degrees in Iceland itself. It is noticeable that the international competitiveness and productivity of firms has not been more extensively taken up in the debate, given the extensive coverage of the World Economic Forum in the period.

## Norway

One relatively extensively debated output-related issue was how the component in the new budgeting system for higher education institutions for calculating a minor part of institutional funds on the basis of registered scientific publications would affect researchers' behaviour. Although the scheme triggered much controversy, parts of which also surfaced in the general media, little opposition can be discerned in the debate against the principle that a scheme of performance-based funding crediting scientific publication activity is justified. The controversy focused on aspects of the *design* of the scheme, in particular pertaining to aspects that would, allegedly, have distorting effects on publication practices: Norwegian will lose out as scholarly language; participation in public debate and dissemination activities are not credited; quality will deteriorate as a consequence of splitting up results into as many separate publications as possible and seeking "easy" publication outlets. Judged by well-documented changes<sup>27</sup> in the publication behaviour of university researchers, they seem to support the system to a higher extent than the extensive public controversy about its introduction may indicate.

As seen in Figure 14.2, the issue of university rankings is a relatively minor issue in Norwegian debate. When it did emerge, it was often linked to the issue of enabling colleges to become universities, and the debate about "elite universities".

The design and implementation of the Skattefunn scheme for tax deduction for R&D expenses was controversial and the scheme found its final form after several years of discussion and re-design. Its major justification was the novel scheme required to respond to the challenge of the low level of private R&D funding in Norway. This paved the way for the scheme despite strong reluctance and resistance (which did *not* surface in the debate) within Government and, initially, in the RCN itself. Part of the controversy surfaced in the public debates where some, in particular as stated in editorial comments in *Dagens Næringsliv*, saw the scheme as an unproductive subsidy to private companies

Figure 14.2 indicates that issues pertaining to the role of citizens in research policy have been more salient in Norwegian debate than in other Nordic countries. Citizen's issues may, indeed, be seen to be a strong dimension in Norwegian research policy. Norway has a highly well-developed system for addressing issues of research ethics: the Technology Board which was established in 1998 on the Danish model for supporting lay technology assessment, and the many public controversies during the early part of the period over gene technology research, may be expected to have spilled over into research policy debates in the more restricted sense of the term, as applied within this project. Some resonance can also be found at the beginning of our period of a debate which peaked earlier on the collusion of research and politics and the integrity of research triggered by some cases of dubious commissioned research. It seems, however, that Figure 14.2 may overstate the role of citizen related issues in Norwegian debate, perhaps due to differences in coding. While there are some articles with this as their main topic, including articles that pertain to the Technology Board controversy in 1998, public dissemination of research (see also "telekantsystemet" above), and – in particular – the infamous Sudbø fraud case that exploded in early 2006 and made Norwegian research an unwelcome news item all over the world for a few weeks. With a restrictive application of the "citizens and research" criteria, this topic does not seem to have been salient during the period. We saw also in Figure 3 (section 4.2.2) that few "outsiders" beyond the immediate stakeholders groups took active parts in the debate.

It is also noteworthy that Norwegian debate has a much higher number of references to citizens than in any other country.

## Sweden

Issues related to international competition have been very common during the period. Many articles draw a picture in which Sweden's position is threatened, or might be threatened unless action is taken. Thus, other

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<sup>27</sup> Ulf Sandström, *Forskningspolitikk 1/2009*



countries are mainly referred to as competitors and benchmarks. The ranking issues are not yet raised in Sweden; however they might be in the near future, in addition to publication issues. The calls for Nobel prizes to Sweden could be seen in that perspective.

The teaching research links are sometimes discussed, not only in relation to doctoral training. Some articles on research policy refer to the need of close relations to education, almost routine-like with references to the Humboldtian ideas. One exception was the director at the Swedish Research Council, who suggested separate units for education and research at higher education institutions. Departments should be abolished and institutions should try other ways to organize their activities, he argued (DN 2003-07-27).

On the whole, there has been an important and clear shift from expansion and quantity to consolidation, concentration of resources and emphasis on excellence. Another important shift is the increasing focus on innovation. The use of that concept has indeed developed over time and, significantly, the latest government research bill was called the research *and innovation* bill.

### 3.3.5. WHICH TOPICS AND ISSUES WERE MOST FREQUENTLY DISCUSSED?

Figure 17 below provides an overview of the specific issues that were the most frequently taken up by the articles in our material. The figure indicates that out of the total 47 issues covered by our analysis, the 24 in the figure were the most frequently discussed, with the most frequent at the bottom of the figure. Each country is represented by the number of articles on that topic in that country.

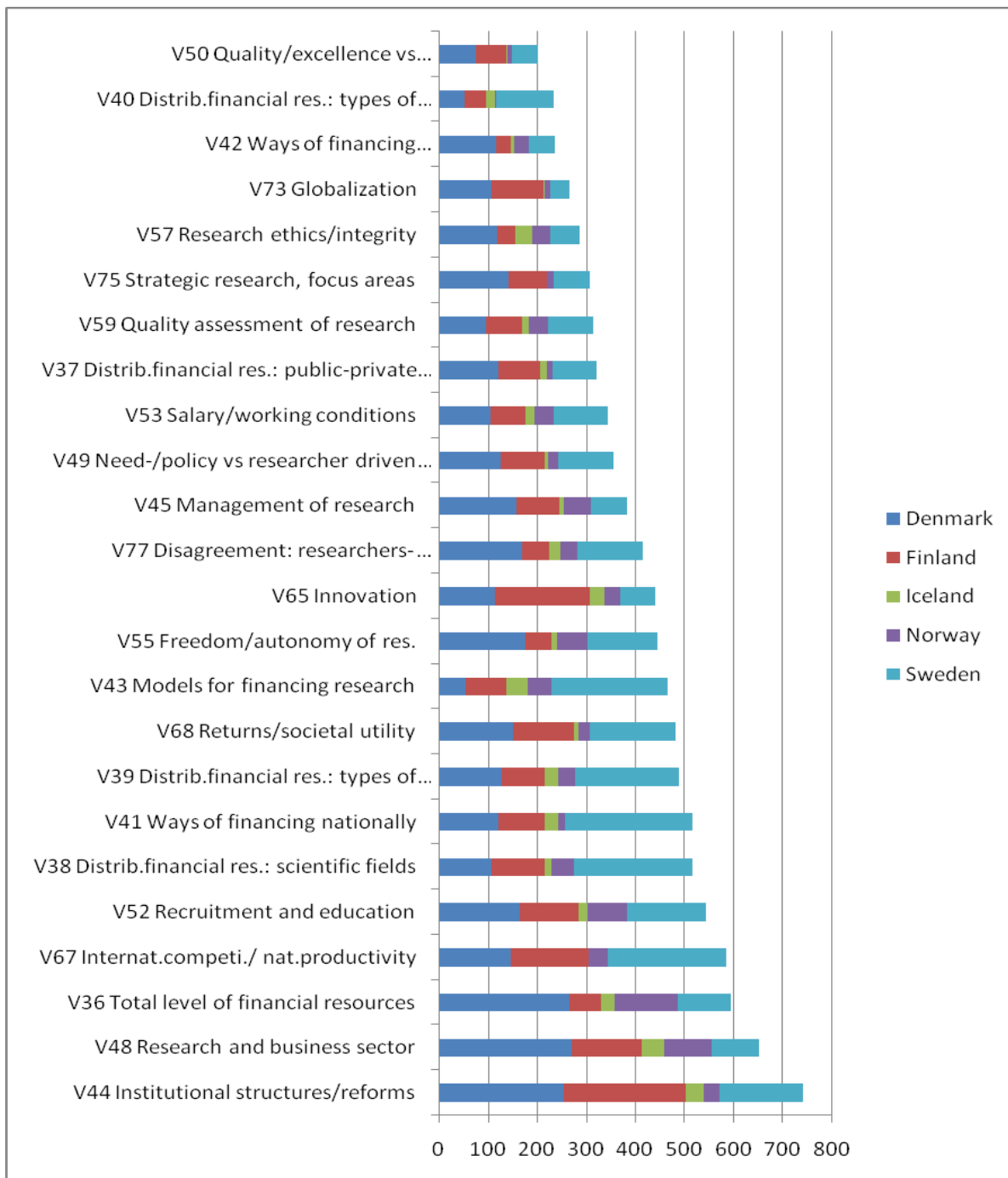


Figure 17 Specific sub-topics on top of the Nordic public agenda (N=12880)

The order of frequency in the overall material is different from that of each country taken separately. For example, in Denmark the issue “research and business sector” (V48) is relatively more prevalent than the “institutional structures/ reform” issue (V44). The opposite is the case for Finland. While the “models for financing research” issue (V43), is among the most frequently occurring issue in the Swedish material; it is only at position number ten in the total for the all Nordic countries during the period.

### 3.4. WHICH DISCIPLINES WERE DISCUSSED?

In this sub-chapter we map the content of debate articles in terms of which scientific fields and what forms of research (basic/applied research, e.g.) that are discussed in them. These aspects of article content are only

indirectly related to the specific topics and issues. The measure “scientific field referred to” is coded according to the dominant field in the article. If no specific field or dominant is mentioned, the article is coded ‘research in general’.

The coding encompasses six categories. The category ‘agricultural, veterinary and fishery science, forestry included’ was virtually unused in the categorization of the debate article. The term ‘research in general’ on the other hand was frequently applied in all countries except for Norway as indicated in Figure 18. For all countries considered together, technical science/new technology is the dominant category, followed by health science. At national level, the health science field was the most dominant category in Iceland and Norway, while playing a more subdued role in Denmark and Finland where technical science/new technology prevailed. The humanities had a comparatively more prominent role in Danish, Norwegian and Swedish debate articles than in the Finnish and Icelandic material <sup>28</sup>.

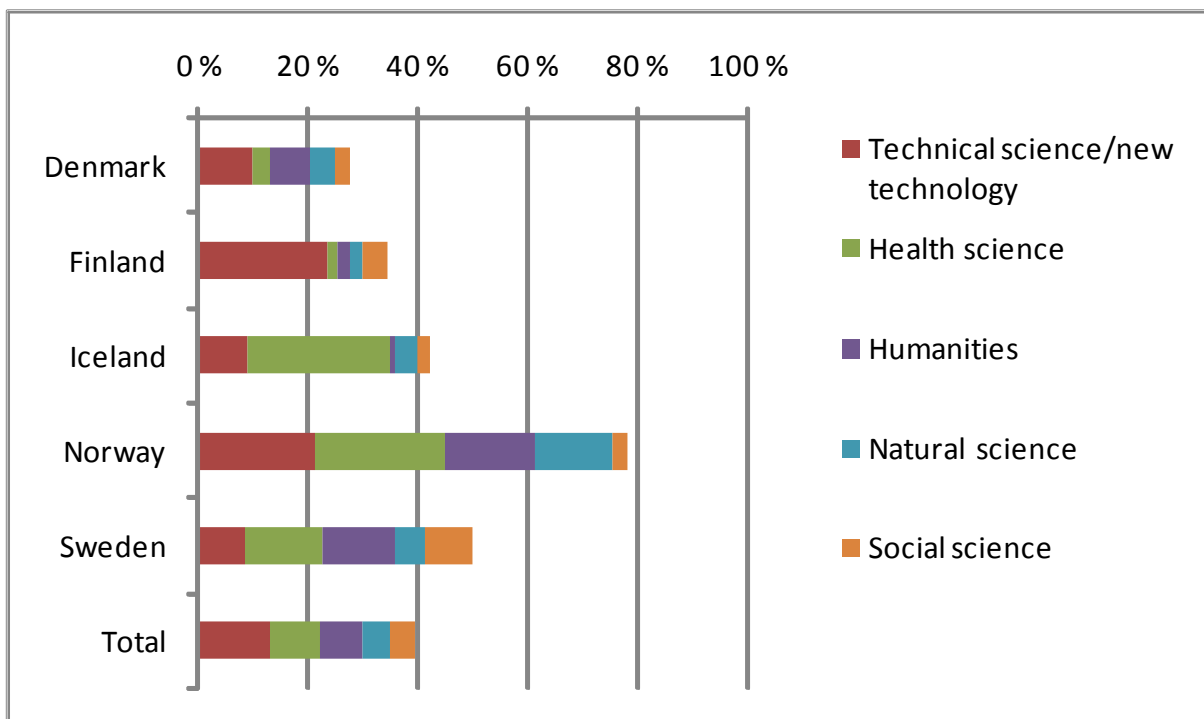


Figure 18 Scientific field referred to – the five most prevalent categories, excluding ‘research in general’ (references to a plurality of fields)’. Percentage (N=1703)

The forms of research referred to in articles were also coded for differences along the research/application dimension, see Figure 19 below.<sup>29</sup> We observe that the categories “basic research” and “research and development” are the forms of research that are most frequently addressed in the articles. These patterns may be seen to confirm that the large part of research policy debates had a university (research) bias, and also that the notion that “R&D” should be seen as a whole, often as a share of GDP, played a salient role in these debates. To what extent this is a direct impact of the European Barcelona target is more uncertain; in some cases – such as Norway – the “R&D share of GDP” issue predated the Barcelona target. But these results can probably be taken as an indication of any influence by the EU agenda on national policy debates.

<sup>28</sup> Only 40 percent of the total set of articles that were coded in the five countries was classified as about specific fields of research, i.e. the majority were coded under ‘research in general’. For Norway only 20 percent of the articles were coded as ‘research in general’. This difference may partly be the result of different interpretation of the categories used in the coding.

<sup>29</sup> If several forms of research are addressed, but no form has a dominant role in the content of the article, up to three forms of research may be coded. Different applications in the coding of categories for ‘form of research’ may to a large extent also account for the deviating results for Norway. See footnote 18.

Figure 19 provides a picture of the distribution of articles in terms of the forms of research addressed. We see that basic research is the dominant reference in all countries except Finland where the more applied ‘Research and development’ is much more prevalent. We also note that ‘strategic research’ is more prominent in the Danish and Finnish debates than in the other countries.<sup>30</sup>

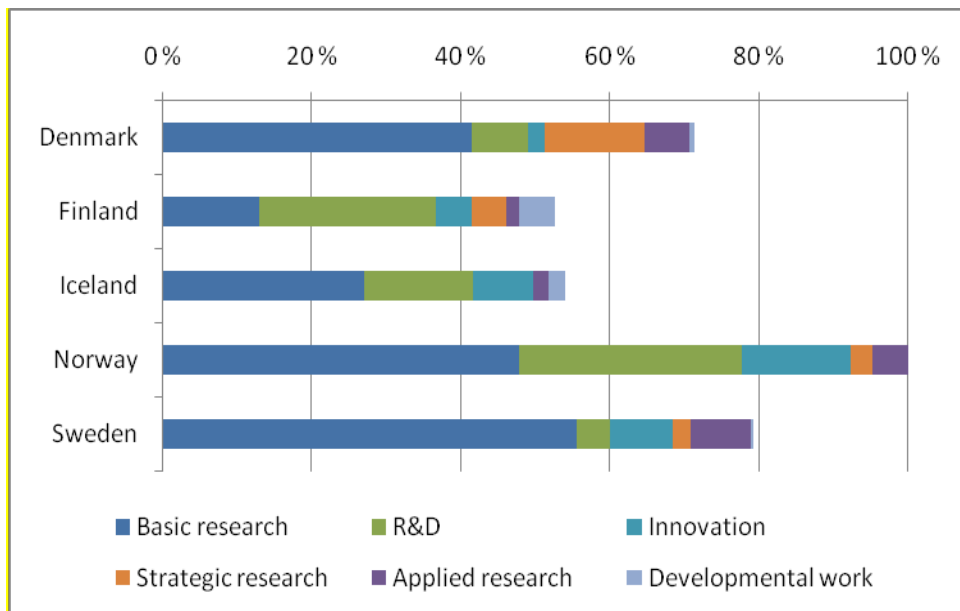


Figure 19 Forms of research, the category ‘Research in general’ is excluded. Percentage (N=1703)

#### Denmark

This figure shows that more than two-thirds of the debates in Denmark refer to science policy in general, indicating that it is the situation for science in general which is featured on the agenda, more so than for specific scientific fields.

#### Finland

Technical science and new technology play a prominent part in the Finnish debate. Figure 19 shows that in Finland R&D is the dominant form of research referred to. Even though basic research seems to be somewhat neglected, the debaters have been concerned about its role compared to R&D investments. This has been especially mentioned in the debates on external funding and research as a service activity. Researchers are afraid that they will not be able to use funding for basic research or teaching because the external funders expect to benefit from the research in a certain way and will steer the research strategically (HS 2003-01-30).

#### Iceland

Similarly to the other Nordic countries except Finland, basic research is referred to in half the cases which can be assigned to a specific area of research and development. This may be seen to reflect the vigorous debate on university research. When scientific field is taken into consideration, Health and Medicine is quite prominent. Research and development in general is also rather prominent.

<sup>30</sup> Caution must be exercised in drawing conclusions on this point since this dimension is sensitive to national particularities in the wording of the terms. The criteria to code this variable were however based on the principle that the central words of the substantial categories (or their synonyms) were explicitly present in the text. All terms were defined in the guide to the code key and referred to the international standard for research and development statistical purposes, i.e., the OECD *Frascati Manual*.

## Norway

The relative distribution of scientific fields reflects the salient role that university researchers in general and medical researchers in particular have played in Norwegian debates. Medical researchers were highly active during the late 1990s when resource issues rose to the top of the research agenda, and the poverty of Norwegian medical research was focused, and documented. The active role of medical researchers lingered through active role of some highly prominent and visible players, such as the 1999–2001 rector of the University of Oslo (Kåre Norum), and professor Per Brandtzæg, who wrote several long debate articles throughout the period under analysis (and continues to do so to this day). While phrasing his arguments in terms of “research”, using the low Norwegian “R&D share of GDP” as evidence, he generally refers to university research, and often to experience from his own (fields of) research. We also note a relatively high frequency of articles that address the humanities.

## Sweden

As for scientific fields, the majority of the articles in Sweden concern Humanities and Medicine. One obvious, or at least relatively unsurprising, reason is that both fields demand more money, although not always as straightforwardly phrased as: “More money for Humanities Research!” (UNT 2005-05-15). However, the fields differ somewhat in the way they argue. As far as medicine is concerned, there seems to be no requirement to argue for the societal needs for research in this field. The starting point is rather that Swedish Medicine research is losing ground in an international perspective. International competition is the argument for more resources. A bibliometric report from the Swedish Research Council showed that Sweden was losing ground to other countries such as the US, which spent far more money on medicine and health science research. The internationalisation issues have been discussed in the Humanities as well. Swedish Humanities scholars should be more internationally recognized and active in networks, one journalist wrote (DN 2005-04-12). In fact, the great Humanities debate in 2005 started with professor Sverker Sörlin’s critical reflections on Swedish universities’ positions in the ranking tables. However, the debate soon became narrower, more national and even disciplinary. The lack of international contacts and national publishing in Swedish Humanities research has been discussed by a number of writers, although most of them represent only a few disciplines such as literature and history of ideas.

### 3.5. WHAT CHALLENGES WERE PICKED UP?

The forms of research classification are also linked to the topic ‘New Challenges’ which we defined as a collection of strategic issues of research policy. The ‘new challenges’ topic consists of seven issues ranging from local/ regional initiatives to globalisation, see Figure 20.<sup>31</sup>

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<sup>31</sup> A full list of issues under the “new challenges” category:

V70 Nordic initiatives on research policy (e.g. NORIA)

V71 European initiatives on research policy

V72 Other international initiatives on research policy (e.g. from OECD, GLOREA)

V73 Globalisation

V74 Policy interaction/Policy-mix

V75 Strategic research focus areas

V76 Local-/regional considerations

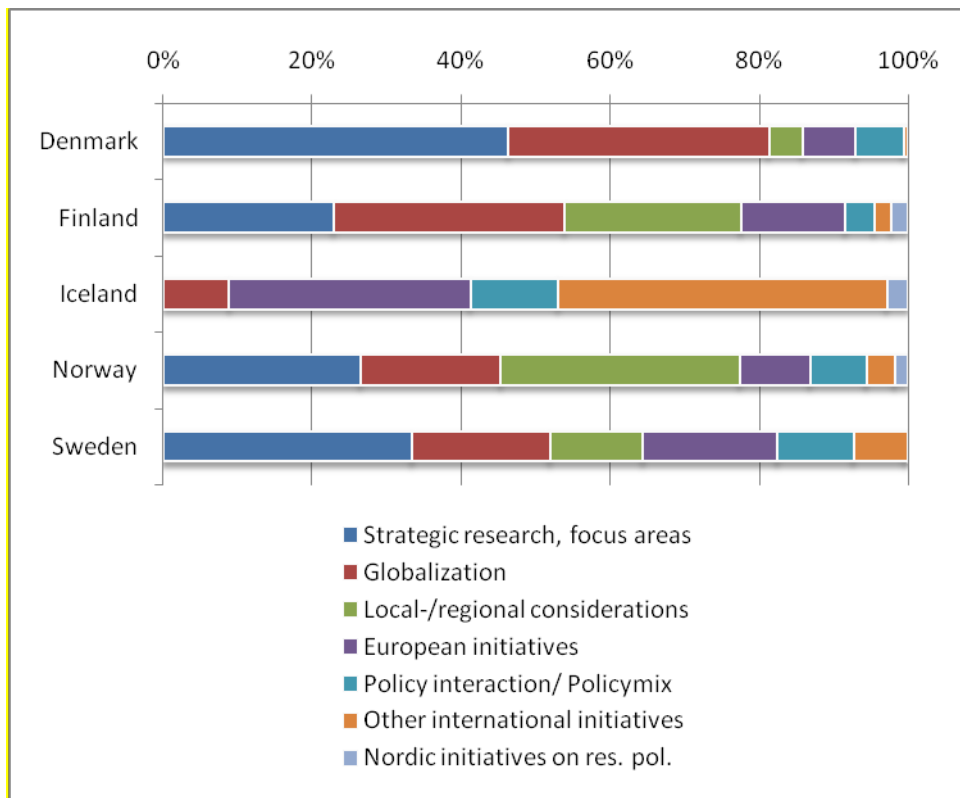


Figure 20: New Challenges by country and sub-topic (N=954)

Figure 20 indicates that the two categories Strategic research focus areas<sup>32</sup> (selected by research councils/ government) as well as references to the globalisation challenge prevailed in the debate articles in all countries except Iceland. In Iceland, funding of R&D through research programmes has not been common. The largest part of competitive funding has been for general research funds rather than programmes. R&D programmes have increased in importance after the establishment of the Science and Technology Policy Council, but their budgets remain rather small.

#### Denmark

As shown in Figure 18 strategic research is on the agenda in Denmark more than in any other Nordic country, and this discussion includes references to initiatives presented by research funding councils especially created for strategic research.

#### Finland

Globalisation issues turn up clearly in 2004 when the first globalisation report was published. The background for the report was Prime Minister Vanhanen's initiative to find out the possible consequences of the upturn in the economies of China and other low-cost countries. In the Preface, the globalisation report states that the starting point for the report is the same as Wim Kok's committee, and a clear reference is made to the European Union and its targets (VN 2004, 5). As globalisation is the major challenge in the Finnish debate, education and research play a crucial part in this.

Globalisation is linked with the efforts to move from science and technology policy to innovation policy in all areas of society. This also emerges in the debate since innovation issues become topical at the same time when globalisation is debated. The occurrence of the so-called China phenomenon can be seen in all the

<sup>32</sup> Note that "strategic research" is one form of research, see figure 19, as well as a challenge "strategic research focus areas", see figure 20.

papers, and to some extent the debate reflects the ideas presented by the Science and Technology Council and the second globalisation report in 2006 when a decision was made to establish Strategic Centres of Excellence.

Another aspect of the globalisation debate is the tension between global and local issues. The regional dimension of the education and research system has been extensive but as globalisation has paved the way for a need to reshape the innovation system, universities and higher education are challenged. Behind this is the idea that Finland cannot afford to sustain the university system as such and more specialization is needed. At the same time, however, there is a push towards bigger units and networks, preferably with some international cooperation.

#### Iceland

The Icelandic system of research and development is very small and it is difficult to reach a critical mass of research in most fields of science, even though research in earth sciences and medical and health science is considerable in Iceland relative to the size of the country. Thus, foreign cooperation is essential, and the debate reflects the necessity for Iceland to take part in international cooperation, including the European Framework programmes, Nordic cooperation and international cooperation based on individual research organisations.

#### Norway

As in virtually every developed country research policy has in Norway, has been increasingly framed in terms of enhancing the competitiveness of the national economy. This reflects, apparently, the framing of EU science, technology and innovation policy in its Lisbon agenda in general, and the Barcelona target in particular. Hence, the linking of competitiveness as core policy objective and issues of national/regional R&D funding may be seen to reflect the influence of EU STI policy. This is also the case for Norway, despite its not being a EU-member, *inter alia* through the adoption of the Barcelona target in the 2005 White Paper on research policy. It seems, however, that the specific EU phrasing of the competitiveness/R&D funding nexus did not shape the Norwegian debate to the same extent as in other Nordic countries. While globalisation is salient within the set of articles that discusses one or more topic within the “new challenges” category, that set consists of only one tenth of all Norwegian articles. Local/regional aspects, on the other hand, are highly salient in the Norwegian debate, more so than in any other country. These include both supportive and critical articles.

#### Sweden

As far as Sweden is concerned, globalisation is primarily mentioned at the beginning of newspaper articles, as a point of departure for the ensuing argument. For instance: “In a globalised world, Sweden has to remain competitive in research and innovation”. There was a globalisation committee founded in 2006, including many prominent representatives from the sector, and chaired by the minister of education and research, Lars Leijonborg. The committee has produced many reports, many of which are related to R&D issues.

### 3.6. INTERNATIONAL DIMENSIONS OF RESEARCH OVERSHADOWED BY THE NATIONAL

The articles were also coded to capture references to geographic areas and to international cooperation. “Geographic area” covers both the country and regional levels in order to see whether or not the research policy debate in the Nordic countries looks to other countries or regions for lessons and/or models.

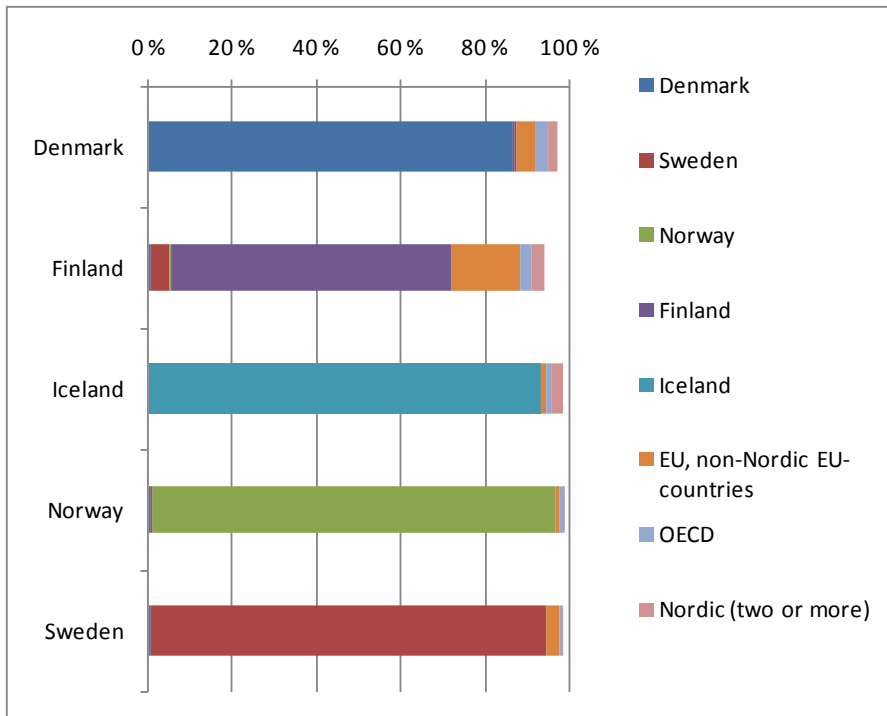


Figure 21.1 Geographic area referred to. Percentage (N=2267)

Figure 21.1 indicates that in all the Nordic countries the research policy debate had an almost exclusively national focus. References to the Nordic countries or other regions were seldom. References to non-Nordic EU countries were more frequent in Finnish debate articles than in articles in other Nordic countries.

Figure 21.2 maps the types of international collaboration which was the topic of a relatively low number of articles that did refer to international research cooperation. This variable was coded accordingly to the most dominant feature of international cooperation the articles. For all countries except Norway, EU cooperation is the most prevalent form of international collaboration discussed.

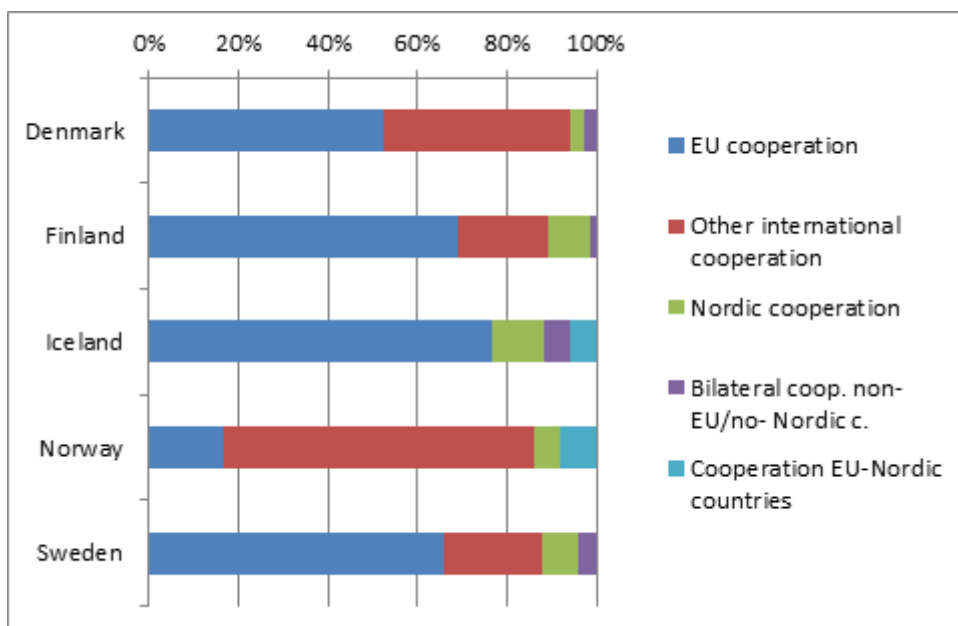


Figure 21.2 Reference to international research cooperation. Percentage (N=275)



## Denmark

As in the other Nordic countries the Danish debate is almost exclusively national. This is partly due to the fact that the scientific environment has undergone large transformations. Many of these transformations have been made without making comparisons to the other countries which Denmark is ordinarily compared to. References to other countries have therefore been kept to a minimum. When reference to international research has been on the agenda – as seen in Figure 17.2 – this has been caused by the Lisbon agreement in 2000 and the Barcelona target from 2002. The Danish “Globalisation Council” from 2005 also brought up references to the EU cooperation. In other words the EU has functioned as a frame of reference when we depart from pure national orientation. The OECD closely follows because of the many recommendations and references also included in the “Globalisation Councils” report in 2005.

## Finland

While the research policy debate is very national in focus and scope in all the countries, articles in Finland refer to the European Union more frequently (see Fig. 21.1.) This includes debates on guidelines of European research policy, and the establishment of the European Technology Institute (KL 2006-03-31 and KL 2006-04-07). It also seems that the Finnish debaters tend to compare the targets of the Finnish policy with those of the EU. Therefore any achievement at the European level is automatically regarded as an example of success.

As concerns Nordic aspects of the debate, a short exchange of views took place in *Helsingin Sanomat* in 2007 when a proposal was made that the Nordic countries should build a network of technology centres outside Europe (HS 2007-06-11). It was argued that especially in the fields of science, technology and culture, all five countries could share a common potential. Nordic cooperation seems, it was noted, to diminish in the wake of European integration, and these countries should invest more in utilization of technology. Some rather daring debaters urged the Nordic countries to maintain dialogical connections and creative thinking but to close down the Nordic Council and the Nordic Council of Ministers (HS 2007-06-12). To replace the Councils a think tank institute was suggested to be established.

## Iceland

Iceland has had access to the EU framework programmes since the coming into force of the European Economic Area (EEA) in 1994. Unsurprisingly, discussions have emerged about the opportunities for Iceland in this cooperation. The Nordic financial system has also been extensively utilized by Icelandic researchers for the benefit of their work. One might have expected to see a larger proportion of articles dedicated to bilateral cooperation with non-Nordic and non-EU countries where cooperation on an institutional basis has been quite frequent in Iceland.

## Norway

As seen in Figure 17.1, the debate in Norway has an almost exclusive focus on national issues. References to other countries are most often in the form of comparisons particularly with other Nordic countries, substantiating claims that Norway is lagging behind on virtually every indicator of “sound” R&D policy. Nordic and European research policy are rarely the topic of the debate, with some exceptions. One of these exceptions was an article by the director of the RCN in 2005 supporting the Lisbon strategy (Aftp. 18-09-2006). It is noteworthy that the only references in our material to specific Nordic policies (NordForsk, NORIA) are found in just one article – by Nordic ministers on the establishment of NordForsk and of the NORIA conception from July 2004.

## Sweden

Also the Swedish debate’s main concern is the national level. References to other countries are seldom, and most often, as in the Norwegian comparisons, almost exclusively with the aim to show how Sweden is lagging behind and losing out in the global competition. There are a few references to EU issues and even fewer to other Nordic countries.

## 4. DISCUSSION AND CONCLUSIONS

In this study we raised questions about what a more detailed mapping of research public debate during this recent ten-year period could say about the main trends of research policy developments in the Nordic countries. These countries – or at least most of them, are “frontier” countries in the progress towards the “knowledge-based economy” and “knowledge society”, if international rankings and benchmarks are to be believed. Does this mean that research issues become more intensely and widely debated by the general public and in the media in these countries? Do groups beyond the inner circle of “usual suspects” – immediate stakeholders and directly affected parties in research and industry – make a stronger impact on the public debate? Are issues and forces that are often seen to drive developments such as competition and innovation, internationalisation and globalisation debated to an increasing extent?

At the same time, allegedly, there is a unique “Nordic approach” to these developments in which retaining the qualities of the welfare state, while pursuing the goals of competitiveness and innovation, are seen to be essential. Is this seen to raise conflicts that find expression in public concern, and how and to what extent does public debate play a critical and/or promotional role in relation to policy development and implementation? Is public debate primarily “reactive” or does it anticipate and push issues that are still not taken up on the policy agenda?

Our data do not provide simple and conclusive answers to these questions. In our analyses we have found a number of similarities and parallel developments, but also variation and divergences.

We asked if our material would support the assumption that research issues, in relative terms, are on the move from the periphery to the centre of both the general political process and public debates in general news media. We did indeed find some support for this. We saw (Figure 1) that while the extent of research policy debate remained relatively stable during the first half of the period, there was an overall increase in all countries except Iceland during the period 2002–2006. The increase was, however, uneven, and for all countries the number of articles fluctuated widely from one year to the next. These variations could to some extent be seen to reflect peculiarities of policy developments in each country supporting the interpretation that the increasing importance of knowledge in the economy and society also makes an impact on the volume of public debate on research.

A key question is, however, whether a more pervasive societal influence of knowledge in public perceptions also has an impact on the structure of public debate, in terms of which social groups take an active part in these debates. It follows from the assumption that knowledge is perceived to become increasingly important that broader sections of the public would also see themselves as affected to an increasing extent by research policy issues and decisions. Or, contrary to these predictions, does research policy remain a confined, *sui generis* type of policy, in which the role of the “usual suspects” – immediate stakeholders in academia, industry and research institutions, as well as actors directly responsible for policy development and implementation in research ministries and agencies – remain as dominant as they have been?

We did not find much support to for the assumption that extensive change is taking place in the structure of public debate. The role of researchers and representatives of research institutions combined as the dominant group of authors of interventions in the debate was clear in all countries except Iceland where controversy over a genetic database has triggered a broad public debate. The dominant role in the debate of researchers is particularly strong in Sweden. The presence of civil society remains marginal in all countries, the least so in Iceland, which does not provide much support for the idea that a general shift is taking place in terms of participation in research policy debate from immediate stakeholders to wider social groups. The perception of the Nordic countries as countries where civil society and the lay public play particularly active roles in public debates and policy process concerning science and technology is thus not confirmed by our data. This appears at least to be the case for issues of research policy as defined in our project. There is, independently of this

project, strong evidence that these groups *do* generally take active part in debates where research, technology and innovation issues are strongly linked to applications and/or broader policy issues, such as ethics (e.g., gene technology), environmental and health policy (e.g., risk regulation).<sup>33</sup>

We did find a notable difference in particular between Denmark and Finland concerning the relative roles of politicians and representatives of ministries. While this group was particularly active in Denmark, it took a much less prominent role in Finnish debates. The role of business was also relatively minor in all countries, but was more active in Denmark than in the other countries.

We also found (Figure 5) that public debate on research policy issues are to a large extent *policy-driven* in most countries. The policy-making process and actors largely determine and frame the agenda of the debate, which responds to and follows initiatives and statements by policymakers. If this is a feature of the debates in all countries, it is much more salient in Denmark and Sweden than in Norway and Finland. This pattern is also valid for the “referred actors” variable (Figure 7). While other ministers than the minister responsible for research were often referred to in Denmark, the Finnish minister for research and education was hardly referred to at all. Researchers were the most dominant “referred actor” group in Norway, as it was, if to a lesser extent, in Finland and Sweden.

Overall, we find that disagreements between researchers and politicians are by far the most common in all the Nordic countries. However, we find a higher level of disagreement among researchers in Finland and Iceland and more disagreements between politicians and researchers in Denmark, Norway and Sweden.

We could see little evidence that potential conflicts between values at stake surfaced in the debate. There were few explicit references to sustainability/environment and to welfare: references to economic growth and knowledge society were more frequent. This was particularly the case for Finland, and – for the knowledge society – for Denmark. There were very few negative references to the role of research as sustaining these values. A few more negative references to research as instrument for economic growth did appear in the Norwegian debate.

There was a similar overall research policy agenda in all the countries. Main issues in all of these were resource issues, in particular unmet resource needs in research and the level of overall national research investments; the reorganisation of research institutions, in particular higher education institution; the freedom of research, including both the availability of funds for “free” research and academic freedom. A less homogenous picture emerges when we move from the “core” of research policy to the interface of research with society, in terms of the role of research for innovation and enhancing the competitiveness of the national economy. These issues were more strongly voiced and advanced in the research policies in Finland and Denmark, and consequently were more salient in the debates on research in these countries. “Innovation” is the output issue that was the most extensively debated in Finland where technology policy has been more dominant than science policy both in the official policy documents and in the public debate. Recently innovation policy has taken the lead and become linked to all policy sectors making innovation an important aspect of both economic and academic performance. The role of innovation policy has become particularly evident through globalisation reports, restructuring of the university system and innovation strategies that have been formulated at the end of the 2000s.

Even though public debates respond to, and are triggered by policy initiatives and agendas, this does not mean that all important initiatives and issues within the policy are also reflected in the debate. One may argue that in

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<sup>33</sup> See e.g., Gutteling et al. (2003), Media coverage 1973–1996: Trends and dynamics, in M. Bauer & G. Gaskell: *Biotechnology. The Making of a Controversy*, pp. 95–128, Cambridge University Press: Cambridge. For a somewhat different picture for Finland: Karoliina Snell (2009), *Social Responsibility in Developing New Biotechnology: Interpretations on Responsibility in the Governance of Finnish Biotechnology*, University of Helsinki.

some cases policy initiatives and decisions that were particularly important in terms of long-term structural impact on the research system were developed and implemented without rising above the threshold of public attention and debate. This applies to the Norwegian debate where key policy decisions during this period such as the establishment of the Research Fund, the introduction of the Centres of Excellence scheme, the new structure of funding of higher education institutions, with performance-based funding and (partial) separation of funding for research and teaching, and the steep increase in the costs of Norwegian participation in EU framework programmes for research, all proceeded without much controversy or debate in the general media. Similar features may be found in the Finnish debate, while in Denmark all policy initiatives are published by the Ministry of Science in newspaper articles and following debated by the immediate stakeholders.

One may see the quasi-absence in the Norwegian debate of any controversy on the Centres of Excellence scheme at the time it was introduced and implemented as relevant to our research question about potential conflicts between policies for the knowledge-based economy and incumbent “Nordic” concerns with welfare and equality. While policies for the knowledge-based economy will often emphasize concerns with global competitiveness, the virtues of “world-class excellence”, and the necessity to concentrate resources to create “critical mass” research, one would expect these to be resisted or dampened by “Nordic” concerns with distributional equity and equality in society. Research and innovation policies within all the Nordic countries have arguably adopted elements of the former, “elitist” type of approach to an increasing extent. While these might be expected to run against strong egalitarian attitudes in Nordic societies and cause public controversy, we see to the contrary that this movement towards more saliently “elitist” policies in research met with little protest and was widely embraced in the public debate

As resource issues are the dominant set of topics in the debate, and much of this debate was about overall national funding of research in general, and about funding targets derived from or similar to the Barcelona target, one might argue that the European dimension did play a direct role in the national debates, despite scarce explicit references to the EU. As this debate was – and is – largely concerned with exerting pressure on national governments to increase (public) funding of research, there is a confluence of European policies within the framework of its “open method of coordination” (OMC) approach and the dominant voices in the national research policy debate: both exert pressure on national governments to increase the national funding of research. Numerous references to the Barcelona target in such statements indicate a European influence on national debates about this issue. We saw in Figure 15 that the “total level of financial resources” was for the Nordic countries taken together the third most frequently discussed topic. It was particularly salient in Denmark and Norway. To a certain extent, public debate may be seen to have acted as an “ally” to the European Union, exerting pressure on national policy-makers to increase research funding. To this extent, the Barcelona target may be seen to have worked as intended within the EU OMC framework.

The stronger focus on innovation and competitiveness in the global knowledge economy may also be seen to explain that policy debates in Finland differ notably from that of the other countries by a stronger presence of international issues and perspectives. We saw (Figure 17.1) that the debates in all countries have an extremely strong national focus, with few articles containing references to other geographic areas than its own. Finland differs again from the others by a larger number of articles with references to the EU area. The stronger EU focus of the Finnish debate is also emphasised by the higher number of articles that address international collaboration within the EU (Figure 14.2). The Nordic dimension, as indicated by references to Nordic countries, separately or as a group, or to Nordic collaboration(s), is virtually absent from the debate in all the Nordic countries.

We also see the strong imprint on the national debate by some particularly active individuals, including not only the responsible minister(s), but also leaders of academic institutions and research institutions, journalists who cover these debates over an extended period of time, as well as “intellectuals” and individual researchers with no formal position. This, together with our observations, that civil society still does not play a very active role in these debates, may indicate that even in the Nordic countries, research policy remains largely a policy

area located at the margins of the general political process, most often attracting only the interests of immediate stakeholders and people with expert knowledge about the specific area.

The ten-year period of our analysis illustrates extensive, even continual, institutional reforms in research as it concerns higher education institutions. Autonomy, institutional research strategies, commercialisation and entrepreneurship, as well as evaluation/performance/accountability and stronger linkages and collaboration between academic research and industry reveal adaptations to the knowledge-based economy. The debate also focuses on the effects that these changes may have on the academic professions and institutions in the long-term.

## 5. APPENDICES

### APPENDIX 1: CROSS TABLES AND FIGURES

*Table A1: Distribution of articles in the 10-year period 1998–2007*

	Denmark	Finland	Iceland	Norway	Sweden	Total
1998	30	35	23	31	48	167
	4.1%	7.5%	13.6%	7.8%	9.2%	7.3%
1999	44	38	12	29	46	169
	6.1%	8.1%	7.1%	7.3%	8.8%	7.4%
2000	41	39	16	32	47	175
	5.6%	8.3%	9.5%	8.0%	9.0%	7.7%
2001	40	15	19	33	50	157
	5.5%	3.2%	11.2%	8.3%	9.5%	6.9%
2002	47	25	15	33	27	147
	6.5%	5.3%	8.9%	8.3%	5.2%	6.4%
2003	76	41	10	30	30	187
	10.5%	8.7%	5.9%	7.5%	5.7%	8.2%
2004	103	57	10	29	81	280
	14.2%	12.2%	5.9%	7.3%	15.5%	12.2%
2005	124	58	16	67	68	333
	17.1%	12.4%	9.5%	16.8%	13.0%	14.6%
2006	139	96	13	51	67	366
	19.1%	20.5%	7.7%	12.8%	12.8%	16.0%
2007	82	65	35	63	60	305
	11.3%	13.9%	20.7%	15.8%	11.5%	13.3%
Total	726	469	169	398	524	2286
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table A2: Type of article unit – distribution within the Nordic countries.

	Column comment	Editorial/ leader	Opinions	Letter to the editor	Interview	Comment/ analysis	Another type	Total
Denmark	110	88	436	32	53	7	0	726
	15.2%	12.1%	60.1%	4.4%	7.3%	1.0%	0.0%	100.0%
Finland	36	116	98	177	38	3	1	469
	7.7%	24.7%	20.9%	37.7%	8.1%	.6%	0.2%	100.0%
Iceland	0	5	0	99	4	60	1	169
	0.0%	3.0%	0.0%	58.6%	2.4%	35.5%	0.6%	100.0%
Norway	123	30	113	3	48	75	5	397
	31.0%	7.6%	28.5%	.8%	12.1%	18.9%	1.3%	100.0%
Sweden	33	46	392	0	21	34	0	526
	6.3%	8.7%	74.5%	0.0%	4.0%	6.5%	0.0%	100.0%
Total	302	285	1039	311	164	179	7	2287
	13.2%	12.5%	45.4%	13.6%	7.2%	7.8%	.3%	100.0%

Table A3: Main Actor (author)

	Denmark	Finland	Iceland	Norway	Sweden	Total
Minister/Ministry responsible	64	2	7	21	18	112
	8.9%	0.5%	4.2%	5.4%	3.5%	5.1%
Other minister/ministry/ the government	5	1	0	4	0	10
	.7%	0.2%	0.0%	1.0%	0.0%	0.5%
MP parties in government	36	1	1	9	16	63
	5.0%	0.2%	0.6%	2.3%	3.1%	2.9%
MP not parties in government	45	3	7	9	27	91
	6.2%	0.7%	4.2%	2.3%	5.2%	4.1%
Politician subnational	4	4	1	0	11	20
	.6%	1.0%	0.6%	0.0%	2.1%	.9%
Res.-/innovation- pol. body	31	21	23	26	11	112
	4.3%	5.1%	13.9%	6.7%	2.1%	5.1%
Another civil servant	4	13	3	1	7	28
	.6%	3.1%	1.8%	0.3%	1.3%	1.3%
Management of research inst.	54	61	19	28	41	203
	7.5%	14.7%	11.5%	7.2%	7.9%	9.2%
Organisation/union for researchers	16	8	3	14	23	64
	2.2%	1.9%	1.8%	3.6%	4.4%	2.9%
Industry	40	4	2	2	8	56
	5.5%	1.0%	1.2%	.5%	1.5%	2.5%
Other parts of/all business	41	16	1	13	8	79
	5.7%	3.9%	0.6%	3.3%	1.5%	3.6%
Another organized interest	29	9	4	7	20	69
	4.0%	2.2%	2.4%	1.8%	3.9%	3.1%
A business enterprise	9	9	4	8	3	33
	1.2%	2.2%	2.4%	2.1%	.6%	1.5%
Committee/commission/council	3	4	3	5	8	23
	.4%	1.0%	1.8%	1.3%	1.5%	1.0%
Individual researcher	150	117	3	115	190	575
	20.8%	28.2%	1.8%	29.6%	36.6%	26.0%
Journalist	144	106	68	118	111	547
	19.9%	25.5%	41.2%	30.3%	21.4%	24.8%
Another type (incl. citizen)	46	27	14	9	13	109
	6.4%	6.5%	8.5%	2.3%	2.5%	4.9%
EU	1	7	1	0	4	13
	.1%	1.7%	0.6%	0.0%	0.8%	0.6%
Another international organisation	0	2	1	0	0	3
	0.0%	0.5%	0.6%	0.0%	0.0%	0.1%
Total	722	415	165	389	519	2210
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%



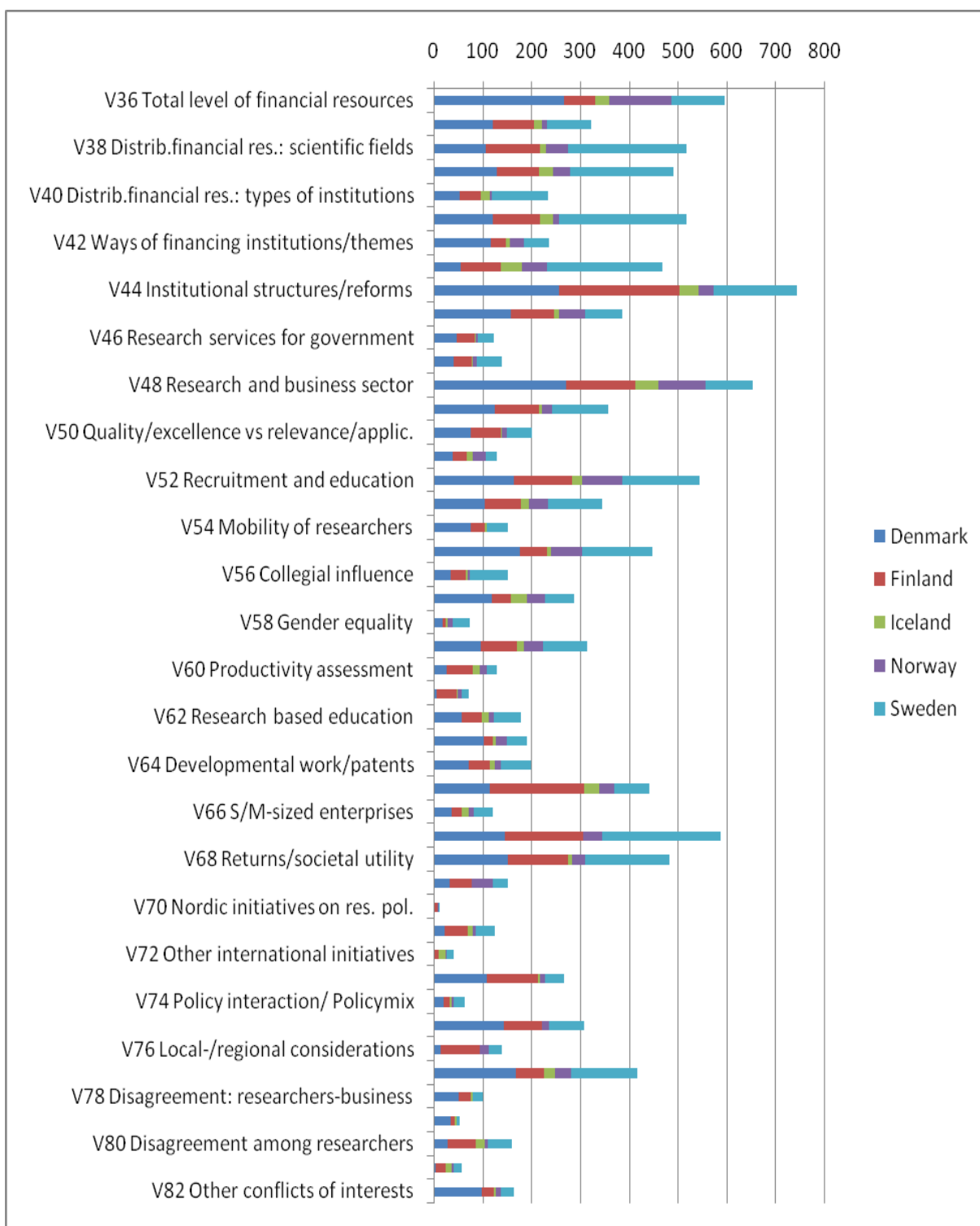


Figure A1: Frequency of sub-topics by country. Count (N=12880)

## APPENDIX 2: CODE KEY FOR THE CONTENT ANALYSIS

### Code key for The Comparative Nordic Study of Public Debate on Research Policy in the Nordic Countries 1998-2007

Variable	Variable values				
<b>Identification variables</b>					
V1 <b>Identification of the unit of analysis (uoa)</b>	(DK:1000-1999, FIN: 2000-2999, ICE: 3000-3999, NOR: 4000-4999, SWE: 5000-5999)				
V2 <b>Media</b>	Den (1)	Fin (2)	Ice (3)	Nor (4)	Swe (5)
	11 Berl	21	31	41	51
	12 Inf	22	32	42	52
	13 JP				
	14 Pol				
	15 Børs				
V3 <b>Date of issue</b>	dd-mmm-yyyy				
V4 <b>Headline (optional)</b>	Textstring				
V5 <b>Writer(s) of uoa (1<sup>st</sup> +2<sup>nd</sup> name(s))</b>	Textstring				
V6 <b>Type of uoa</b>	<ol style="list-style-type: none"> <li>1. Column comment (DK/NO: Kronik(k), SV: Krönika?)</li> <li>2. Editorial/leader (DK/NO: Leder, SV:Ledare)</li> <li>3. Opinions (not 1-2 and not 4-7) (DK: Debatindlæg, NO: Debattinnlegg, SV: Debatt)</li> <li>4. Letter to the editor (DK/NO: Læserbrev/leserbrev, SV: Insändere)</li> <li>5. Interview (NO/SV: Intervju)</li> <li>6. Comment/analysis (editorial discussion article) DK/NO/SV: Kommentar/analys(e)</li> <li>7. Another type (<b>excluding news reporting</b>)</li> </ol>				

<b>Agent variables</b>	
V7 Writer's(')sex	<ol style="list-style-type: none"> <li>1. Female</li> <li>2. Male</li> <li>3. Both sexes</li> <li>0. Not specified</li> </ol>
Type of agent who <b>wrote</b> the unit of analysis (uoa).  V8 Type of agent 1  V9 Type of agent 2	<ol style="list-style-type: none"> <li>1. Minister/Ministry responsible for research</li> <li>2. Other minister/ministry (including those responsible for governmental research institutions) or government as a collective entity</li> <li>3. Other MP from party/-ies in government</li> <li>4. MP from party/-ies not in government</li> <li>5. Politician from subnational levels</li> <li>6. Representative of a research- and innovation- political body</li> <li>7. Another civil servant as a representative of an administrative body on state, regional or local level</li> <li>8. Representative of the different levels of management of research institutions</li> <li>9. Representative of some organisation/trade union for researchers</li> <li>10. Representative of industry</li> <li>11. Representative of other parts of business or of business in general</li> <li>12. Representative of another organised interest</li> <li>13. Person from a business enterprise</li> <li>14. Spokesman for a committee/commission/council (not mentioned above)</li> <li>15. Individual researcher</li> <li>16. Journalist</li> <li>17. Another type (including a private individual, a citizen without indication of the 1-16,18-20 mentioned affiliations)</li> <li>18. Representative of/ publication from EU</li> <li>19. Representative of/ publication from OECD</li> <li>20. Representative of another international organisation</li> <li>0. Not specified</li> </ol>

Type of agent furthermore <b>cited</b> in uoa  V10 Type of agent3  V11 Type of agent4	<ol style="list-style-type: none"> <li>1. Minister/Ministry responsible for research</li> <li>2. Other minister/ministry (including those responsible for governmental research institutions) or government as a collective entity</li> <li>3. Other MP from party/-ies in government</li> <li>4. MP from party/-ies not in government</li> <li>5. Politician from subnational levels</li> <li>6. Representative of a research- and innovation- political body</li> <li>7. Another civil servant as a representative of an administrative body on state, regional or local level)</li> <li>8. Representative of the different levels of management of research institutions</li> <li>9. Representative of some organisation/trade union for researchers</li> <li>10. Representative of industry.</li> </ol>
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	<ol style="list-style-type: none"> <li>11. Representative of other parts of business or of business in general</li> <li>12. Representative of another organized interest</li> <li>13. Person from a business enterprise</li> <li>14. Spokesman for a committee/commission/council (not mentioned above)</li> <li>15. Individual researcher</li> <li>16. Journalist</li> <li>17. Another type (including a private individual, a citizen without indication of the 1-16,18-20 mentioned affiliations)</li> <li>18. Representative of/ publication from EU</li> <li>19. Representative of/ publication from OECD</li> <li>20. Representative of another international organisation</li> <li>0. No type cited</li> </ol>
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Type of agent <b>referred to</b> in uoa.	<ol style="list-style-type: none"> <li>1. Minister/Ministry responsible for research</li> <li>2. Other minister/ministry (including those responsible for governmental research institutions) or government as a collective entity</li> <li>3. Other MP from party/-ies in government</li> <li>4. MP from party/-ies not in government</li> <li>5. Politician from subnational levels</li> <li>6. Representative of a research- and innovation- political body</li> <li>7. Another civil servant as a representative of an administrative body on state, regional or local level)</li> <li>8. Representative of the different levels of management of research institutions</li> <li>9. Representative of some organisation/trade union for researchers</li> <li>10. Representative of industry.</li> <li>11. Representative of other parts of business or of business in general</li> <li>12. Representative of another organized interest</li> <li>13. Person from a business enterprise</li> <li>14. Spokesman for a committee/commission/council (not mentioned above)</li> <li>15. Individual researcher</li> <li>16. Journalist</li> <li>17. Another type (including a private individual, a citizen without indication of the 1-16,18-20 mentioned affiliations)</li> <li>18. Representative of/ publication from EU</li> <li>19. Representative of/ publication from OECD</li> <li>20. Representative of another international organisation</li> <li>0. Not specified</li> </ol>
V12 Type of agent 5	
V13 Type of agent 6	
V14 Type of agent 7	

V15 <b>What caused</b> the uoa?	<ol style="list-style-type: none"> <li>1. A law, a bill, an executive order and the like (national level)</li> <li>2. Appropriations of financial resources for research (national level)</li> <li>3. Some other statement/initiative from national politicians</li> <li>4. Statement/initiative fra EU (all forms)</li> <li>5. Statement/initiative from interest group(s) /NGO(s)</li> <li>6. Statement/initiative from researcher(s)</li> <li>7. Journalist' initiative</li> <li>8. Something else (e.g. committee reports)</li> <li>9. Previous discussion (not 1–8)</li> <li>0. Not indicated</li> </ol>
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<b>Type of researcher cited in uoa</b>  V16 Type 1  V17 Type 2	<ol style="list-style-type: none"> <li>1. Professor/Head of a medical division at a hospital</li> <li>2. Head of research/director of a research institution/head of a developmental division</li> <li>3. Associate professor/senior lecturer</li> <li>4. Ph.D./research assistant/lecturer</li> <li>5. Researcher, in general</li> <li>6. Other type</li> <li>0. No researcher cited</li> </ol>
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<b>Type of researcher referred to in uoa</b>  V18 Type 1  V19 Type 2	<ol style="list-style-type: none"> <li>1. Professor/ Head of a medical division at a hospital</li> <li>2. Head of research/director of a research institution/head of a developmental division</li> <li>3. Associate professor/senior lecturer</li> <li>4. Ph.D/research assistant/lecturer</li> <li>5. Researcher, in general</li> <li>6. Other type</li> <li>0. No researcher referred to</li> </ol>
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<b>Characteristics of the research field of public debate</b>	
V20 <b>Scientific field</b> referred to in uoa	<ol style="list-style-type: none"> <li>1. Natural science</li> <li>2. Technical science/new technology</li> <li>3. Health science</li> <li>4. Agricultural, veterinary and fishery science plus forestry</li> <li>5. Social science</li> <li>6. Humanities</li> <li>7. Cross-disciplinary research</li> <li>8. Research in general (or reference to plurality of fields)</li> <li>0. Not specified</li> </ol>

Type of <b>research institution</b> referred to in uoa	<ol style="list-style-type: none"> <li>1. Universities and other higher education institutions (i.e. research based education).</li> <li>2. Hospitals, health services</li> <li>3. Governmental research institutes</li> <li>4. Other public non-governmental/regional research institutions</li> <li>5. Private non-profit research institutions</li> <li>6. Research institutions of the private business sector</li> <li>7. Another type</li> <li>0. Not specified</li> </ol>
V21 Type 1	
V22 Type 2	
V23 Type 3	

<b>Forms of research</b> referred to in uoa	<ol style="list-style-type: none"> <li>1. Basic research</li> <li>2. Strategic research</li> <li>3. Applied research</li> <li>4. Research, in general</li> <li>5. Developmental work</li> <li>6. Research and development</li> <li>7. Innovation</li> <li>0. Not specified</li> </ol>
V24 Form 1	
V25 Form 2	
V26 Form 3	

V27 <b>Policy field</b> referred to in uoa	<ol style="list-style-type: none"> <li>1. Economic policy</li> <li>2. Innovation policy</li> <li>3. Business policy</li> <li>4. Foreign policy</li> <li>5. Finance policy</li> <li>6. Employment policy</li> <li>7. Law policy</li> <li>8. Cultural policy</li> <li>9. Taxation policy</li> <li>10. Education policy</li> <li>11. Social policy/welfare policy</li> <li>12. Gender policy</li> <li>13. Development assistance policy</li> <li>14. Defence policy</li> <li>15. Policy on agriculture, fishery and forestry</li> <li>16. Energy policy</li> <li>17. Transportation policy</li> <li>18. Health policy</li> <li>19. Policy on refugees and immigrants</li> <li>20. Environmental policy</li> <li>21. Another specified policy field</li> <li>22. Two or more of the above mentioned policy areas</li> <li>23. Regional Policy</li> <li>0. Not specified</li> </ol>
V28 <b>Geographic area</b> in focus in uoa	<ol style="list-style-type: none"> <li>1. Denmark</li> <li>2. Norway</li> <li>3. Sweden</li> </ol>

	<ol style="list-style-type: none"> <li>4. Finland</li> <li>5. Iceland</li> <li>6. Nordic countries, two or more of them</li> <li>7. EU, non-nordic EU-country(-ies)</li> <li>8. OECD</li> <li>9. USA</li> <li>10. USA <b>and</b> one or more asian countries</li> <li>11. Asia (one or more countries)</li> <li>12. Other countries (including African countries)</li> <li>0. No specific reference</li> </ol>
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V29 Reference of uoa to international <b>cooperation</b> on research policy	<ol style="list-style-type: none"> <li>1. Nordic cooperation</li> <li>2. EU cooperation</li> <li>3. Cooperation between EU and the Nordic countries</li> <li>4. Other sorts of international cooperation</li> <li>5. Bilateral cooperation with countries not part of EU and not Nordic countries</li> <li>0. No reference</li> </ol>
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V30 Focus of uoa in relation to <b>public-private sector for research</b>	<ol style="list-style-type: none"> <li>1. Public sector research</li> <li>2. Private sector research</li> <li>3. Public and private sector research</li> <li>0. Not specified</li> </ol>
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V31 <b>Time perspective</b> in uoa	<ol style="list-style-type: none"> <li>1. Present</li> <li>2. Past</li> <li>3. Future</li> <li>4. Present + future</li> <li>5. Present + past</li> <li>6. Past + present + future</li> <li>0. Not specified</li> </ol>
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V32 Attitude in uoa on research as a means to <b>economic growth</b>	<ol style="list-style-type: none"> <li>1. Positive</li> <li>2. Negative</li> <li>3. Positive and negative</li> <li>4. Neutral</li> <li>0. Not applicable</li> </ol>
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V33 Attitude in uoa on research as a means to <b>welfare (incl. life quality)</b>	1. Positive 2. Negative 3. Positive and negative 4. Neutral 0. Not applicable
V34 Attitude in uoa on research as a means to <b>knowledge/knowledge society</b>	1. Positive 2. Negative 3. Positive and negative 4. Neutral 0. Not applicable
V35 Attitude in uoa on research as a means to <b>better environment /sustainable development</b>	1. Positive 2. Negative 3. Positive and negative 4. Neutral 0. Not applicable

<b>Policy themes and issues</b> 0: Issue not present in uoa 1: Issue present in uoa	
<b>Financial management - Resource issues</b>	
V36 <b>Total</b> national level of financial resources for research (e.g. % af GNP)	0 1
V37 The distribution of financial resources for research on <b>public and private</b> research	0 1
V38 The distribution of financial resources for research on <b>scientific fields</b>	0 1
V39 The distribution of financial resources for research on different <b>types of research</b>	0 1
V40 The prioritization of financial resources for research between different <b>types of research institutions</b> (macro-level)	0 1
V41 <b>Ways</b> of financing <b>total</b> national research activity (macro-level)	0 1
V42 <b>Ways</b> of financing different types of research <b>institutions/specific themes</b> (macro-level)	0 1
V43 Different <b>models</b> for financing research (including different funds)	0 1



<b>Organisational management</b>	
V44 Institutional <b>structures/systems reforms</b> related to research	0 1
V45 <b>Management</b> of research, including management <b>tools</b> at the level of institutes	0 1
V46 Research based <b>services for governmental</b> authorities.	0 1
V47 <b>Crossdisciplinary</b> research	0 1
V48 Research and the <b>business</b> sector	0 1
V49 <b>Need-/policy</b> driven versus <b>researcher</b> driven research	0 1
V50 <b>Quality/excellence</b> versus <b>relevance/application</b> of research	0 1
V51 <b>Infrastructure</b> of scientific research	0 1
<b>Human resources</b>	
V52 <b>Recruitment</b> and <b>education</b> of researchers	0 1
V53 <b>Salary</b> and working <b>conditions</b> of researchers (e.g. degree of permanent tenure)	0 1
V54 <b>Mobility</b> of researchers	0 1
V55 Academic <b>freedom/autonomy</b> of research	0 1
V56 <b>Collegial influence</b> for researchers	0 1
V57 Research <b>ethics/research integrity</b>	0 1
V58 <b>Gender equality</b>	0 1
<b>Output-related issues</b>	
V59 <b>Quality</b> assessment of research (including methods and indicators)	0 1
V60 Assessment of <b>productivity</b> of researchers (including methods and indicators)	0 1
V61 <b>Ranking</b> of research institutions (including criteria)	0 1
V62 <b>Research based education</b>	0 1
V63 <b>Communication</b> of research results	0 1

V64 <b>Developmental</b> work, patents	0 1
V65 <b>Innovation</b>	0 1
V66 Research and <b>small-/medium-sized</b> enterprises	0 1
V67 Research and international <b>competitiveness/productivity</b> at a national economic level	0 1
V68 <b>Returns</b> from research/societal utility	0 1
V69 <b>Citizens</b> and research	0 1

<b>Challenges</b>	
V70 <b>Nordic</b> initiatives on research policy (e.g. NORIA)	0 1
V71 <b>European</b> initiatives on research policy	0 1
V72 <b>Other international</b> initiatives on research policy (e.g. from OECD, GLOREA)	0 1
V73 <b>Globalisation</b>	0 1
V74 <b>Policy interaction/ Policymix</b>	0 1
V75 Strategic research <b>focus areas</b>	0 1
V76 <b>Local-/regional</b> considerations	0 1
<b>Conflicts</b>	
V77 Disagreement between <b>researchers and politicians</b>	0 1
V78 Disagreement between <b>researchers and the business sector</b>	0 1
V79 Disagreement between <b>politicians and the business sector</b>	0 1
V80 Disagreement among <b>researchers</b>	0 1
V81 Conflicts involving <b>citizens</b> (or groups of citizens) about research	0 1
V82 <b>Other conflicts</b> of interests (including problems of <b>incapacity</b> ).	0 1
V83 <b>Relevance of uoa for qualitative analysis</b> 0: No 1: Yes	0 1





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