

The role of research councils in project funding – a comparison of the roles and instruments used by research councils in three countries

Stig Slipersæter ¹, Benedetto Lepori ², Michael Dinges ³

¹ NIFU STEP Studies in innovation, research and education, Oslo

² Università della Svizzera italiana and Observatoire des Sciences et Techniques, Lugano

³ Joanneum Research, Wien.

Introduction

Funding of research in the public sector has undergone some changes in recent years. University leaders generally believe that the level of core government funding is decreasing, while funding from research councils, industry, the European Union etc is believed to increase (Salerno, Jongbloed et al. 2005). There are some evidence for the increase of funding through grants and contracts (Geuna 2001; Geuna and Martin 2003), while other studies indicates these perceived changes not always hold empirically true (Lepori, Benninghoff et al. 2005). The beliefs expressed by university leaders probably reflects the usefulness of funding received from various intermediaries and agencies as seen from the researchers point of view. Since general government appropriations often are tied up to the coverage of running costs and leaves the institutions with little freedom, funding from the various kinds of agencies and intermediaries or industry might be the only way to make possible new research initiatives. The perceived importance of this kind of funding is quite rational as it might be very important for pushing research forward. This again calls for the development of methodologies for the study of funding extra to the ordinary budgets.

Research councils are the main mediator of such funding through research grants and projects, as they in most industrialised countries have been the preferred way of institutionalising "the second channel" of research funding. The choice of instruments and the criteria set for a project being applicable for support from the councils is of major importance for the researchers. Instruments and criteria are co-decisive for the selection of research topics, for the adaptive strategies chosen by researchers and not least for the ability to perform high quality research (Laudel 2006). We will here focus on how research councils play their role as intermediaries by the selection of a set of instruments for funding research, and how this selection might be influenced by the councils' responses to national research policy.

This paper is the result of an ongoing activity within the PRIME NoE focusing on indicators for public funding of research, and more specific analysing the elements and developments of project funding. The paper has thus a threefold aim; to demonstrate the usefulness of public project funding indicators, to analyse the developments of project funding by research councils in selected countries, and to give a first demonstration of how such indicators can be used in policy analysis. In the paper we first discuss the research questions we are posing towards the developments of research council project funding and give a brief exposition of the methodology we have used. We then discuss the theoretical assumptions underlying our understanding of actions by research councils. At last we give some empirical evidence on the developments of project funding, and discussed the findings in relation to our theoretical assumptions.

Research questions and methodology

The first question concerns the possibilities of finding evidence for changes in the portfolios of research councils. Rudimentary evidence for the introduction of new schemes of funding, new initiatives towards universities etc can easily be found in annual reports, newsletters, web pages and other documents from the councils. Such documents does however rarely account for the consequent

changes in allocation of resources between beneficiaries or for the eventual down-scaling of prior instruments to allow for the introduction of new ones. The documentation of changes in portfolios calls for an approach quantifying changes over time in the use of resources, the instruments used and distribution between beneficiaries as well as other relevant variables. Such a study on the various aspects of project funding in a limited set of countries was launched by The European Network of Indicator Producers (ENIP) 2004. The number of countries has since been increased and includes now eight countries (Austria, France, Italy, Netherlands, Norway, Portugal, Spain and Switzerland), of which several have made or are preparing national reports describing the developments of project funding in their countries (e.g. Lepori 2005; Dinges 2006; Poti and Reale 2006). For this paper, we utilise the material collected and analysed through this project, restricted to comparing three countries: Austria, Norway and Switzerland. The restriction is foremost due to data availability; these countries have the richest data sets available. The relative well-organised statistical systems of the funding organisations of these countries have made possible analysis on a more detailed level than possible in larger countries. Second, these countries resemble each other in respect of the organisation of the funding system. All countries have one or more research council in general operating competitive-based funding instruments at an arm-lengths distance from the research performers. This in contrast to France where CNRS are a combined funding and research operating agency, and also have a very close interaction with government which makes it a difficult case for this investigation, and to Italy where the former research council CNR were restructured and removed from its traditional role by 2002 (Poti and Reale 2005).

The second question concerns the possibilities of finding explanations for the observed changes in funding portfolios. Research councils can be expected to be responsive to government, on the one hand, and to the research community (scientists and their institutions) on the other. We assume that the relationship between research council and the two parties it mainly interacts with will be dependent upon several historical (path dependency) and organisational elements; among them the historical tradition and loyalty of the council (loyalty towards government vs. research), the historical tradition and culture for change of instruments (conservative vs. innovative tradition), how the council board and subcommittees are composed (government representatives vs. representatives of the research community), the government's ability to instruct the council, and the council's ability to negotiate and interpret the instructions etc. The magnitude of these and other factors of a more historical and social kind makes them difficult to analyse to the full within the scope of this study, and we focus on the councils as organisations with the ability of deciding its own actions as a response to changes in the environment. We hypothesise then that research councils being responsive to changes in government policies more likely will change their use of instruments and their redistribution of money per instrument according to political priorities. This implies that a responsive council will respond to changes in government policy by changing its own portfolio, i.e. bringing in new instruments to promote goals set by policy-makers or change the actual distribution of resources between the existing instruments. On the contrary we can assume that a non-responsive council will keep to instruments well-known and acclaimed by the academic community, i.e. it will not very often change its portfolio or the relative distribution between the instruments. The use of instruments and the distribution of resources will thus be used as a proxy indicating the strength of the relationship between government and council. For explanations of the responsiveness, we consider the autonomy of the councils, the internal organisation and the influence of the state through the board and other mechanisms, the national research policies and the councils' relation to the scientific community.

Comparing instruments and funding between countries and various intermediaries is not without its methodological problems. The general methodology and more specific approaches applied are discussed extensively in other papers (Lepori 2005; Lepori, Dinges et al. 2005; Lepori, Dinges et al. 2006; Lepori, Dinges et al. 2006) and we do not repeat this discussion here. However, it should be noted that even if the methodology has been consolidated over the last years, it is still under development and not all issues are solved. First, as we here are analysing the institutional level contrary to the national level, which often has been the focus of indicator-based studies, we encounter more often breaks in time series. For our purpose this applies especially to the case of Norway, where five former research councils were merged into one in 1993. Data before and after the merger show some problems of comparability as different classifications of instruments are in use. Second, even if concepts and terminology might seem homogenous, the underlying understanding of what it means

might vary over time, between institutions and countries. The answer to this is to use as simple and overarching categories as possible, but still all variations might not fit into the categories applied.

Intermediaries (research councils) included (from national reports)
Austria (the below are included, from the database)

The Austrian Research Promotion Agency (FFG) was established in 2004 via merger of four main R&D promotion and funding agencies FFF, Technologieimpulse Gesellschaft (TiG), The Bureau for International Technology Co-operations (BIT) and the Austrian Space Agency (ASA):

FFF was the major state R&D and innovation funding agency in Austria. In 2003 the FFF supported business R&D with subsidies and loans worth a total of 239.03 M€; equivalent to a present value of 116.52 m €.

TiG was a specialised agency dealing with programmes that aim to create some degree of structural change or change in the way institutions work. Thus, several of its programmes address science-industry links. All TiG's instruments use very modern and rather formal calls for proposals and competitive processes for selecting projects. While it does not formally have a separate analysis or strategy department, TiG is unusual among the Austrian agencies in having a degree of programme design capability. Its 2002 budget was some 15 m €.

ASA was originally set up in 1972 and plays a certain role in high technology innovation programme management (e.g. nanotechnology). Furthermore it is operating innovation related awareness and information campaigns on behalf of the BMVIT.

BIT provided mainly information and practical help to Austrian applicants to the EU R&D innovation programmes. Its beneficiaries include both companies and parts of the knowledge infrastructure. BIT was not involved in research project funding issues as an agency.

Previous to the establishment of FFG thematic and technology oriented programmes have been administered to a large extent by ministries itself and have been labelled as research contracts (e.g. the Austrian Landscape Research programme 1992-2004). Nowadays, FFG manages to a large extent research and innovation programmes on behalf of BMVIT and BMWA.

In the context of technology oriented programmes one also has to consider the **Innovation and Technology Funds**, which was set-up in 1987 as a virtual fund. The funds were steered by a policy dominated board (Kuratorium) and administered jointly by the ERP-Fund and FFF. In 2003 the fund was dissolved. In 2001, former FFF took over financing and programme management of some technology oriented R&D programmes, for instance the Impulse-Programme Sustainable Development (Nachhaltig Wirtschaften).

The Austrian Science Fund (FWF) is Austria's central body for the promotion of basic research. It is equally committed to all branches of science and in all its activities is guided solely by the standards of the international scientific community. About 70% of the funds of the FWF are reserved for competitive research projects. In 2002 FWF financed 373 projects with an associated volume of 63.32 Mio Euros. The budget of the FWF (including mobility programmes etc.) amounted to 91.53 Mio Euros.

Switzerland

At the intermediary level, the main actors are the two project funding agencies:

The Swiss National Science Foundation is a private foundation created in 1952 to support basic research in universities. It is completely funded by the Confederation through the research budget and its tasks and duties are defined in the Swiss Research Act of 1984. However, the SNF enjoys of an almost complete autonomy concerning its internal organization (ruled by the statutes) and the selection of research projects.

The main funding instrument of the SNF are the so-called free research projects which account for more than 2/3 of the overall budget. Moreover, starting in the '70, the SNF accepted to manage some oriented research programs, where the subjects are defined by the State (national research programs, priority programs, national competence centers in research). Finally, the SNF has extensive grants programs, mostly for Swiss researchers doing a research period abroad.

Norway

The five research councils prior to 1993. Research council of Norway since 1993 (data not available until 1997).

Descriptions of councils to be added.

Theoretical approaches for analysing the roles of research councils

Research councils might maintain several roles depending on who is being addressed and the purpose of the action. Towards the scientific community a council's main role will normally be as a funding agency for scientific projects, but it might also serve as a developer of research policy through choice of instruments, priority areas and through its selection mechanisms. Towards policy makers will act as an agency implementing policies, but will also have its own agenda of increasing public budgets for research or the implementation of specific strategies and schemes for certain fields of research, the construction of research facilities etc. Towards the general public, the research council might act as a disseminator of scientific results, or, in the opposite direction, serve as a mediator towards scientists of public concerns about the scientific results in certain fields like genetics or nuclear radiations. Even if we might think of research councils primarily as an agent for the government, it should be obvious that most councils maintain more roles than this one, and consequently that a council's actions will be dependent upon its relations to more than one part and its ability to fulfil more than one type of task. To be able to study the development of research councils and their roles, we thus need a flexible approach accounting for the complex relations between a council and its surroundings.

A first approach is to develop a typology of how research councils maintain their primary task as funding agencies. Even if we argue that research councils have several tasks and complex relations towards a larger environment than the scientific community, it should be obvious that their main purpose and *raison d'être* still is to act as mediator of public funding for research purposes. How the role as funding agency is conducted, will partly be dependent upon the relations the agency has to its principals, namely the government and other policy-makers. In general, funding agencies, can be divided into three categories (Braun 1998). a) Science-based agencies serve all disciplines, respond to problems raised by disciplinary communities and tend to propose disciplinary solutions, i.e. they will tend also to choose disciplinary oriented instruments for their funding. b) Strategic agencies serve the solution of particular problem areas (e.g. health, environment, public services etc), respond to problems raised by disciplinary communities, the scientific community in the larger sense and by external actors. Strategic agencies will seek disciplinary and inter-disciplinary solutions to the problems posed. According to Braun, this is the largest group of intermediaries and includes NSF in the US and CNRS in France. c) Political agencies will respond to problems raised by external actors, and will tend to utilise multi-disciplinary schemes. This category, primarily serving the solution of problems posed by political actors, is rarely found. For our purposes, one of the interesting observations by Braun is the variations in choice of solutions by the various types of agencies. As a science based agency will tend to select discipline-oriented solutions, i.e. instruments, the tracking of projects funded from this kind of agency should be expected to empirically demonstrate this selection by showing an over-representation of disciplinary instruments. Turning the observations in reverse, indicators for use of instruments should be able to contribute to the understanding of the overall categorisation and operative modes of research councils.

The above typology is useful for understanding the main categories of intermediaries and the principal-agent relation between the state/government and the funding agency. However, the typology does not fully explore the relationship the agencies have to the scientists (van der Meulen 1998). A research council can not exist for long or fulfil its mission without being accepted, and thus influenced, by the scientists. In a research council scientists will normally be represented in boards and committees deciding what instruments to use and in the committees selecting the projects to be funded, not to mention the necessary interest scientists have to show for applying for the support schemes the council provides. In some councils, the influence of scientists are quite large as they not only are represented in selection processes and selection committees (as peer reviewers and committee members), but also are represented in the boards at various levels (even sometimes constituting the majority of board members) and often the senior officials of the council are recruited from scientific positions. The relationship between government and council will thus be modified by the relationship between council and the scientific community. In this way the research council will be an intermediary not only in the sense of intermediating funds, but also intermediating between the interests of

policymakers and the interests of the scientific community (Braun and Benninghoff 2003; van der Meulen 2003). Research councils are thus in a situation with a double set of relations, and often with a double set of power relations or pressure (or, to use the principal-agent model, serving two sets of principals), and can be expected to develop their organisation, strategies and actions with the aim of satisfying policy makers, scientists or both, depending on the strengths and weaknesses of their relations. The actual position a council has to its principals, policymakers and scientists, can then be understood as a position on a continuum from total control by policymakers to total control by scientists. The actual position will obviously in most cases be someplace in-between and also be susceptible to change according to variations in the composition of government, personal relations between directors and ministers or directors and influential scientists, institutional arrangements etc. Another aspect needs also to be considered, namely the possibility of the council being in-homogenous in its relations to its surroundings. Relations can vary internally in the council, depending on the relation the various parts of the council keep to its principal(s) (van der Meulen 2003). In total, the position of a research council towards its main principals can be a very complex one depending on the actual powers deployed and exercised along many dimensions of interaction.

The relations the research council has to its principals can be expected to influence the actions of the council. In our context, this means that a strong relation between the council and the ministry providing its resources will make the council susceptible to responding positively to the ministry's policies by choosing actions expected to contribute positively to the fulfilment of those policies. On the contrary, a strong relation towards the scientific community will make the council more susceptible to respond positively to the wishes expressed by scientists. The strategic responses by research councils to their surroundings can in general be analysed by use of organisational and institutional theories, depicting ideal-types of organisations and their strategic responses to their surroundings.

A much used distinction of organisations is between rational, natural and open systems (Scott 1992; Thompson and McHugh 1995). A *rational system* is oriented towards the achievement of specified goals that are normally clearly defined and where there are unambiguous criteria for selecting the actions contributing to goal attainment. Rational systems are usually characterised by being highly formalised social structures. Research councils obviously have some characteristics belonging to the rational system, e.g. at the overall level have the goal of improving scientific knowledge and at programme or project level more specific goals for scientific achievement. Also the organisation can be rather formal, with sometimes distinct structures (departments, sections) according to scientific disciplines or for special purposes (e.g. scientific equipment, PhD grants etc). However, rational systems are usually regarded as relatively closed towards their surroundings, being mainly geared towards the fulfilment of internally defined goals and not very easily influenced by others. Even if research councils obviously show some of the features of the rational organisation, we think the characteristics of such systems does not fully reflect the complexity of the research councils relations to their surrounding as described above. A *natural or organic system*, on the other hand, is usually described as an organisation where the participants share the common interest of surviving as a system and where most activities are geared towards this goal. In some versions of this system, the organisational environment or surroundings is perceived as an enemy who is causing pressures and problems, while others put the emphasis on the environment as a stabilising factor for the organisation. No doubt, viewed as an organic system, a relative stable organisation like a research council will have a strong drive towards maintenance of its own existence, and those identifying with the organisation will contribute to this. Under changing circumstances or changing relations to its principals perceived as a threat for the organisation, whatever their cause, the organisation will be geared into keeping itself intact as an organisation. Even if research councils under periods of fundamental institutional restructuring or when new principles of public management are introduced might act as organic systems, it is difficult to identify research councils generally as primarily being geared towards survival. As is possible true for all organisations, survival is internalised as an inherent goal of the organisation also for research councils, but we do not find it likely to be the foremost organisational aim of the daily operations. Contradictory to this rather internalist view of organisational goals, organisations can be considered as *open systems* where constellations constantly change, and where the organisation is embedded and dependent on its relation to its surroundings. Open systems organisations have more undefined boundaries, and there is frequent interaction with other organisations as these are perceived to be sources of materials, energy and information vital to the system. Such organisations can internally be more loosely coupled, and its various parts and departments can be pursuing their own strategies independent of the overall strategy of the organisation. Research councils obviously in many respects fit into the definitions of open systems.

They are generally dependent upon others (the state) for their funding, for implementing their goal of selecting the best research projects (the external reviewers and members of committees) and not least for the fulfilment of their ultimate goal of producing new knowledge. For producing new knowledge, this is in most cases done by universities and research institutes; while admittedly, some research councils do this partially in-house through the ownership of research institutions or hiring personnel (e.g. CNRS in France and the former research councils in Norway up to the mid 1980s). Intensive relations to outside partners and organisations are thus a distinctive feature of research councils, indicating the definition of open systems fit relatively well. Evidence for councils sometimes exposing the characteristics of loosely coupled systems, has been confirmed through a study of the divisions of The Research Council of Norway (van der Meulen 2003).

Research councils have some of the features described in all of the three types of organisations described above. Even if they obviously show some features of the rational organisation in their strivings for goal attainment and of the natural organisations in times of reorganisation, in our view their overall structure, dependency and actions fit best into the open systems model. Consequently, this model will be the vantage point for our analysis. This does not imply the relevant features of other models should not be considered, the same attention will however not be paid to these.

Considering research councils as open systems open for influence from the surroundings calls also for analysing this system's responses to the expectations and actions of others. From our perspective, a research council can react to the policies and actions of policy makers on the one hand, and to the expectations and actions of scientists and their institutions on the other. These reactions can be analysed by several approaches, of which we will put emphasis on two; the strategic contingency approach and the resource dependency approach. The *strategic contingency* approach stress the freedom of an agency to determine its own actions against the limitations of internal and external structures (Scott 1992). An organisation will always have several choices open for action, and the decision for which action to take will depend on a variable set of interests, goals and powers. The optimal action for an organisation within this approach is a "functional fit" between environmental settings and internal organisational structures they require (Thompson and McHugh 1995). In the context of research councils, this perspective indicates the councils are relatively free to choose their actions, but however within limits set by the internal and external structures. Another approach, *resource dependency*, put the emphasis on the dependencies of an organisation and how it adapts to this situation (Scott 1992). Any organisation is dependent upon the context of its operations, and neither it is self-sufficient. As organisations will be dependent on external partners for its resources, the more resources coming from the outside the more dependent on others will it be. This approach also emphasises the possibilities of organisations meeting incompatible requirements from various external actors, and the various strategies organisations choose to adapt to these requirements (Oliver 1991). An organisation will thus actively choose strategies to handle their dependencies and the allocations of critical resources.

Section on institutional responses (Scott, Oliver, Thompson) to be inserted.

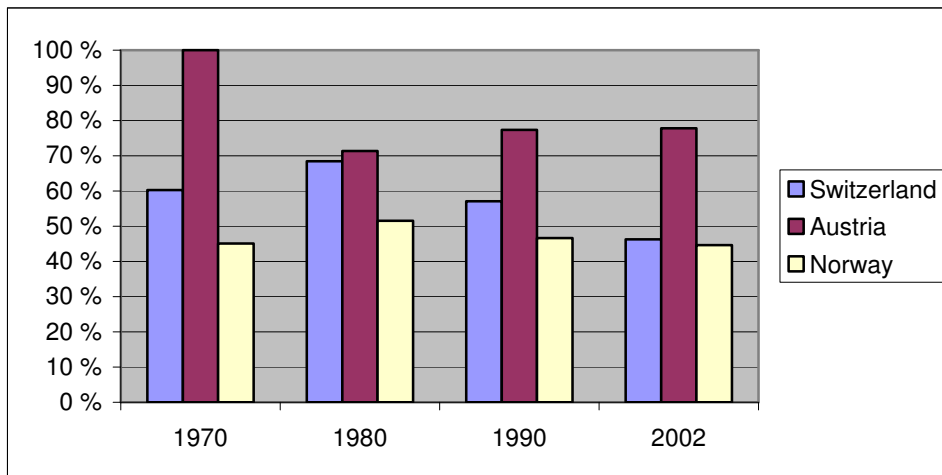
Analytical model to be inserted

Results and analysis

In this section we present first the main quantitative results for the developments of project funding through research councils. Second we present also a more detailed analysis of the development of instruments and beneficiaries.

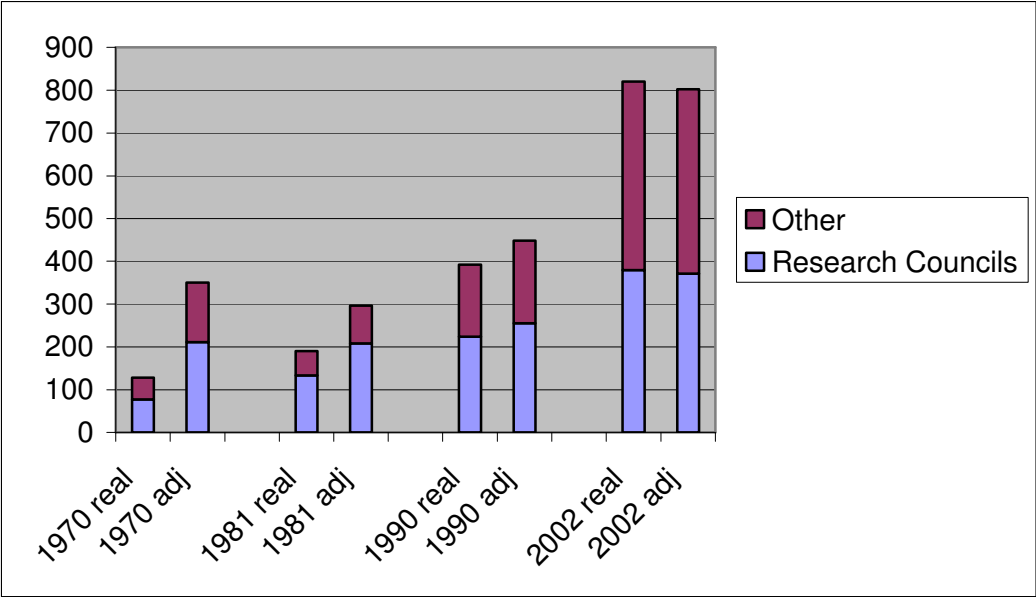
Macro level variations

Figure 1 Share of total project funding by research councils



The share of research councils of the total national project funding shows a relative stable pattern over time. The major exception is Austria in 1970 where the research councils were the only provider of project funding. **Michael, explanations for this?** Since this, the Austrian councils have maintained their share at a level between 70 and 80 percent of the total. The share of the SNF in Switzerland has been reduced over the years, from close to 70 percent in 1980 to below 50 percent 2002. Norway shows a very stable level between 40 and 50 percent of the total. The roles the research councils play in the national project funding thus varies somewhat for the countries we are considering. Austrian councils play a more significant than in the other two countries. Except for Switzerland, the overall picture shows a reasonable stable situation. This means that most of the councils considered have been relatively successful in keeping their role towards the state intact, as a marked reduction in the share of the total would have indicated the introduction of new channels of funding or a reduced confidence in the councils from the government.

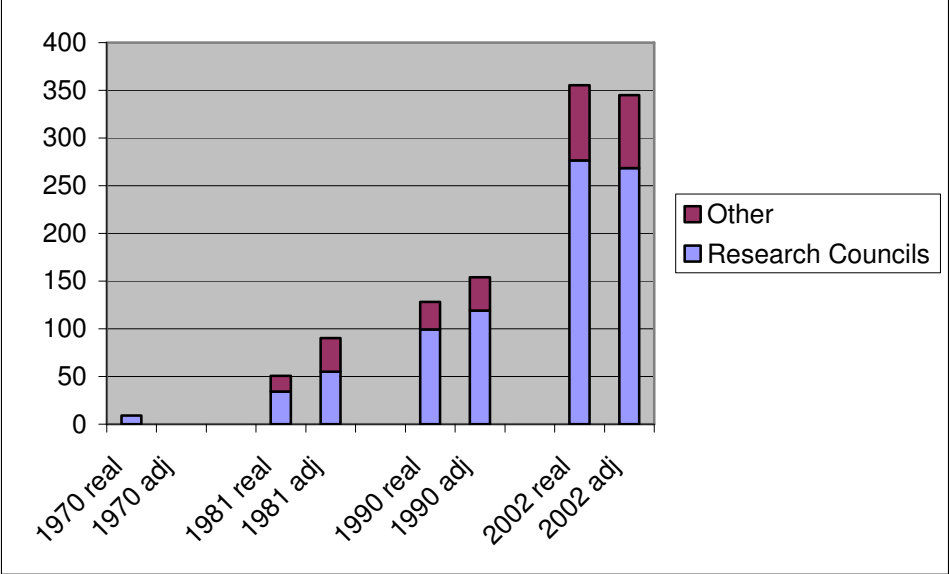
Figure 2 Project funding Switzerland, mill national currency. Real and adjusted for GDP implicit price indices ¹.



¹ 1981 is used as this is the first year of available implicit GDP price indices for Austria.

In the Swiss case, project funding by research councils increased 76 percent from 1970 to 2002 adjusted for implicit GDP indices (figure 2). From a relative stable total funding of 300-400 mill CHF during the 1970s and 80s, a major increase came during the 1990s. There was a 45 percent increase (adjusted) for the SNF in the 1990-2002 period, while other sources combined saw a 124 percent increase. This in some contrast to the situation in Austria (figure 3) where the increase of project funding through research councils 1990 – 2002 adjusted was 125 percent, and the increase for other sources was about the same, 120 percent. The increase was thus far larger for the Austrian councils than the Swiss counterpart, indicating a high trust in these organisations by the government.

Figure 3 Project funding Austria, mill Euro. Real and adjusted for GDP implicit price indices. ¹

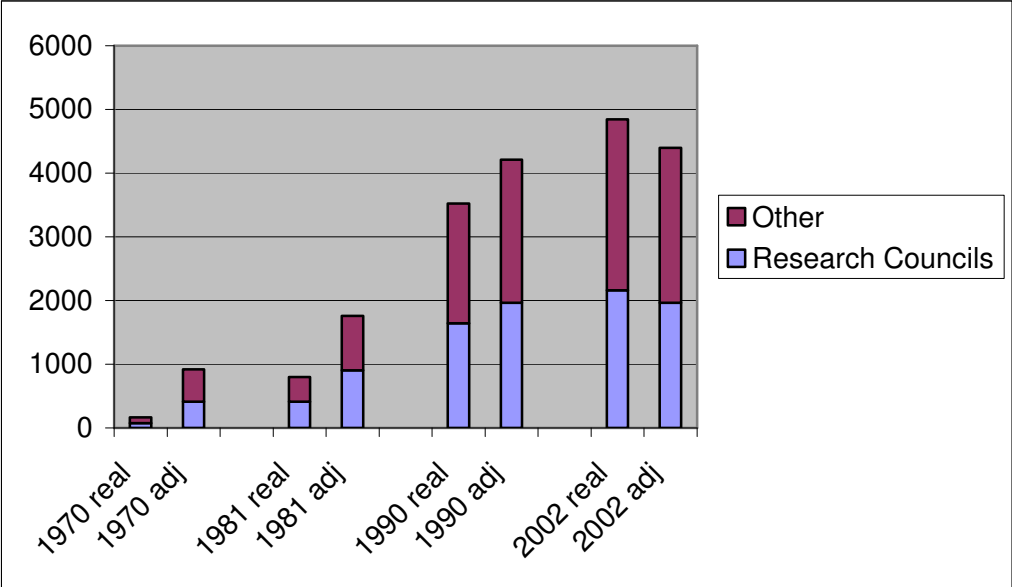


¹ Implicit GDP price indices prior to 1981 for Austria was not available.

In the case of Norway (Figure 4) we see that the most of the increase came in the 1980s, the decade before the two other countries. For the research councils there were actually no growth real from 1990 to 2002, while other sources saw an 8 percent increase in the same years. In these years there was a

reorganisation of the Norwegian research councils from five into one, and the new research council started out with a lower budget than the former five councils combined. Another explanatory factor is data quality, which was not at the same level in 1990 as in 2002. Due to this, project funding 1990 by the research councils are probably overestimated, implying there has been some, but not much increase 1990-2002.

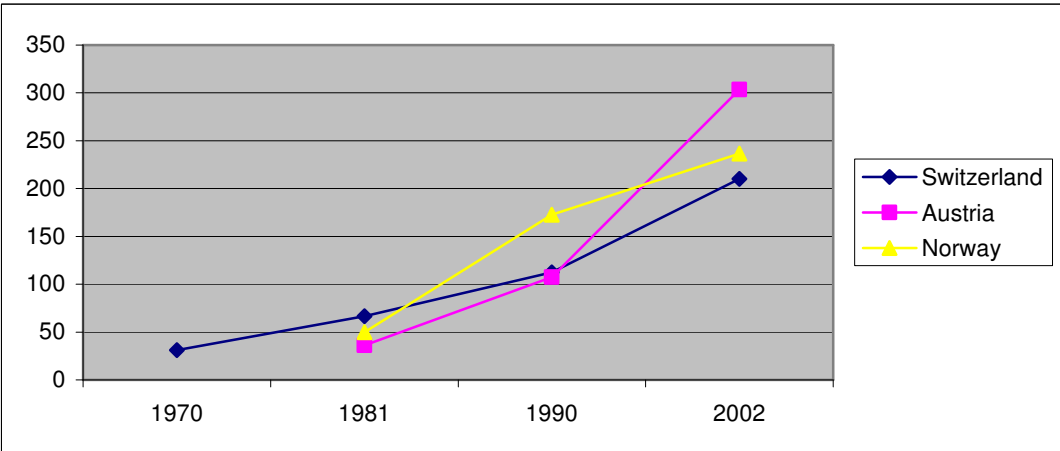
Figure 4 Project funding Norway, mill national currency. Real and adjusted for GDP implicit price indices.¹



¹ 1981 is used as this is the first year of available implicit GDP price indices for Austria.

A noticeable difference between the countries is the growth in the 1970-2002 period. The project funding (real) through Swiss SNF multiplied 5 times during this period, while funding through Austrian and Norwegian research councils multiplied 31 and 29 times respectively. The research councils in these countries have been allocated increasingly more resources than their Swiss equivalent. When adjusting for purchasing parities, the difference is not longer of the same magnitude (Figure 5). By this measure the developments are more homogenous, the highest project funding by research councils 2002 being in Austria, while Switzerland and Norway are converging towards the same level.

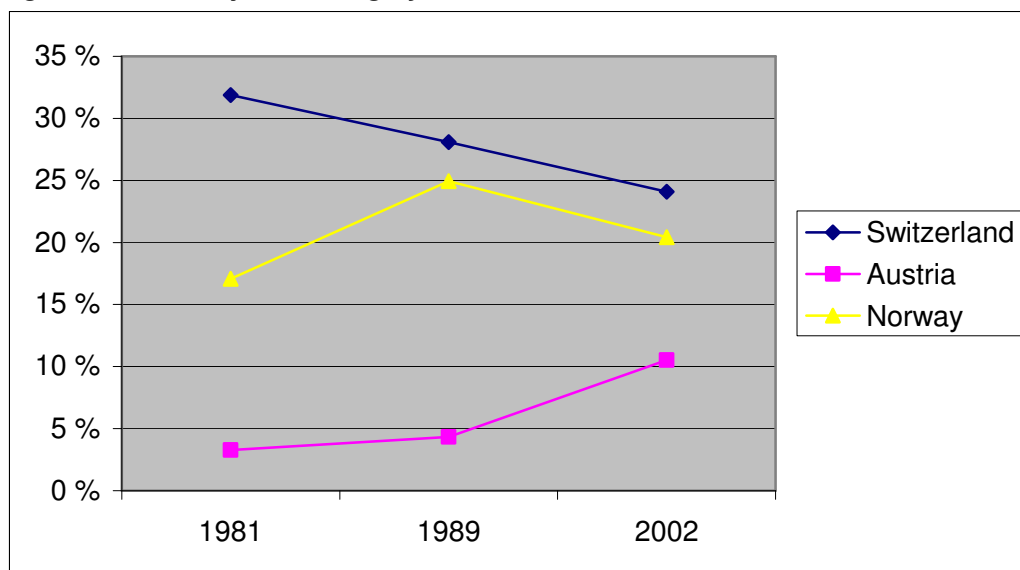
Figure 5 Project funding by research councils adjusted for Purchasing Power Parity. Mill PPP \$¹.



¹ PPPs for Austria and Norway not available before 1981.

Another way of comparing between the countries is to analyse project funding from research councils as a share of public funding for R&D, i.e. as a share of GERD as computed according to Frascati manual (Figure 6) ¹. The increase importance of this kind of funding in Austria is confirmed through this analysis. For Switzerland there has been a steady decrease during the observed period, while for Norway there was an increase during the 1980s in parallel with the observed increase in funding through the research councils. For Norway a larger share of public funding for R&D has been allocated elsewhere since the period around 1990, while for Switzerland there has been a trend of prioritising other mechanisms and beneficiaries at least since 1980, especially direct funding of the higher education sector (Lepori 2006).

Figure 6 Project funding by research councils as share of GERD ¹.



¹ Selection of years according to availability of GERD.

From this analysis of the overall pattern of research council project funding we can discern some converging and some separating developments. Most notably is the diminishing role of SNF in Switzerland. While the research councils in the two other countries have managed to keep a significant position in the national project funding, the SNF has not been able to get the same increase in its budget, at least not in the part dedicated to projects. The developments in Austria and Norway shows however a different pattern as the increase in Norway came during the 1980s while in the 1990s in Austria. This is confirmed by the opposite trends in the share of GERD. Normalising the figures by PPS indicates a more convergent trend, namely a slow growth in all countries and a relative close position of the three in respect of the purchasing powers of the funding. The strong purchasing power of the CHF compensate somewhat for the slower increase in the nominal values.

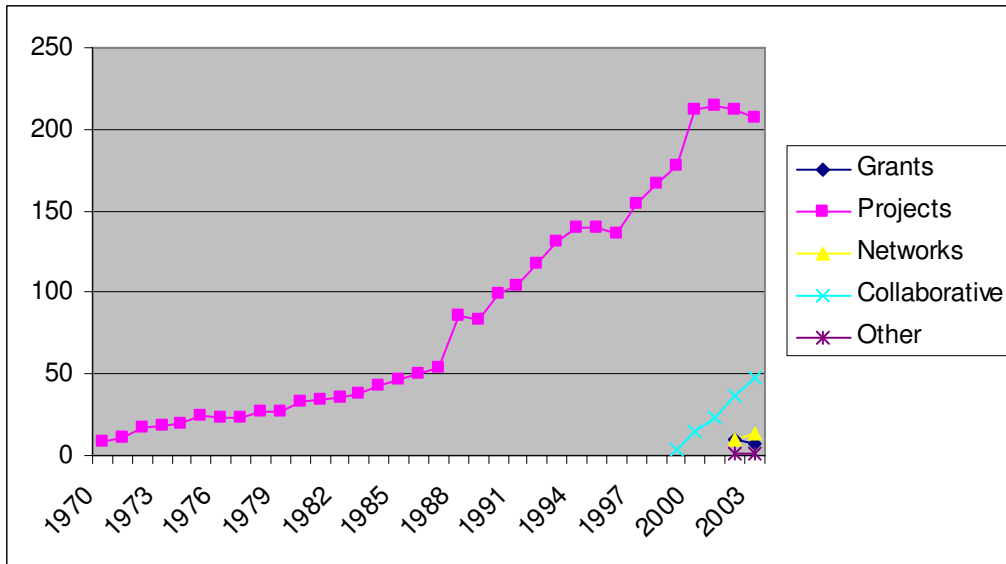
Explanations

- Norway: increase role of research councils in the 1980s, new council established. Reduced budget by time of merger. Large expansion of HEI and direct allocations during 1990s. EU FP as additional source.
- Switzerland: Factors mentioned in Benedettos SPP paper + Braun 2003. Others?
- Austria: ???

¹ The methodologies for assessing the volume of project funding and for GERD is not identical, and the two are not directly comparable. As project funding through research councils is part of public outlays for R&D, the use of GERD should however be relevant for indicator use.

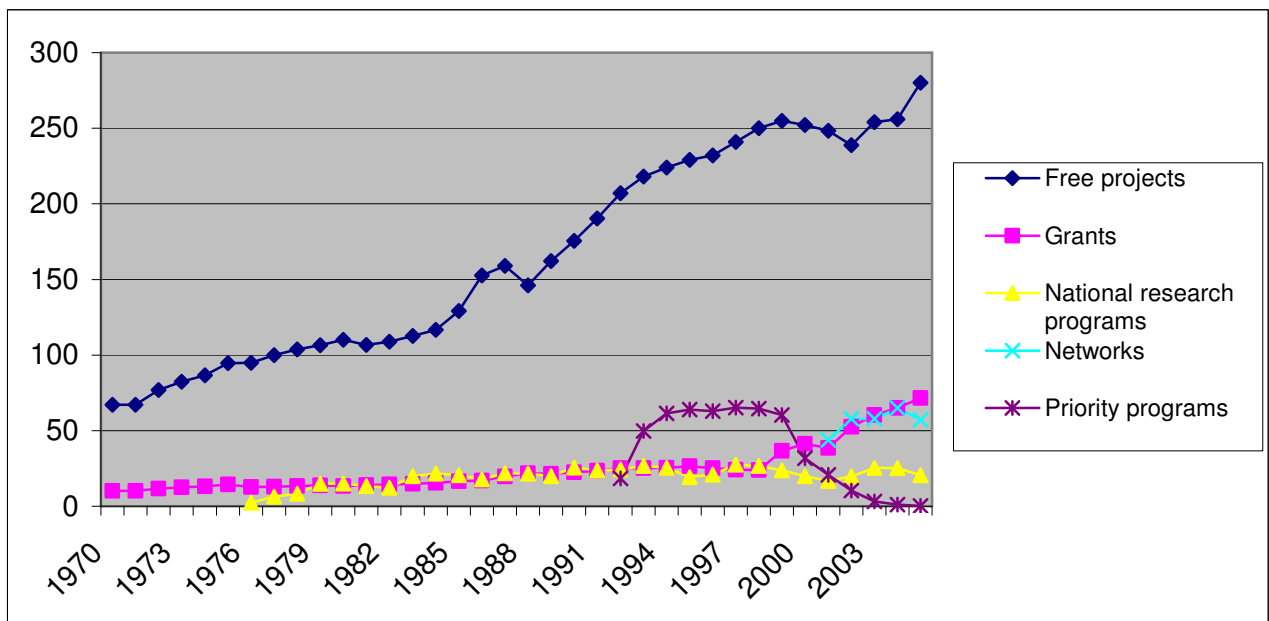
Instruments

Figure x Funding by category of instruments, Austrian research councils



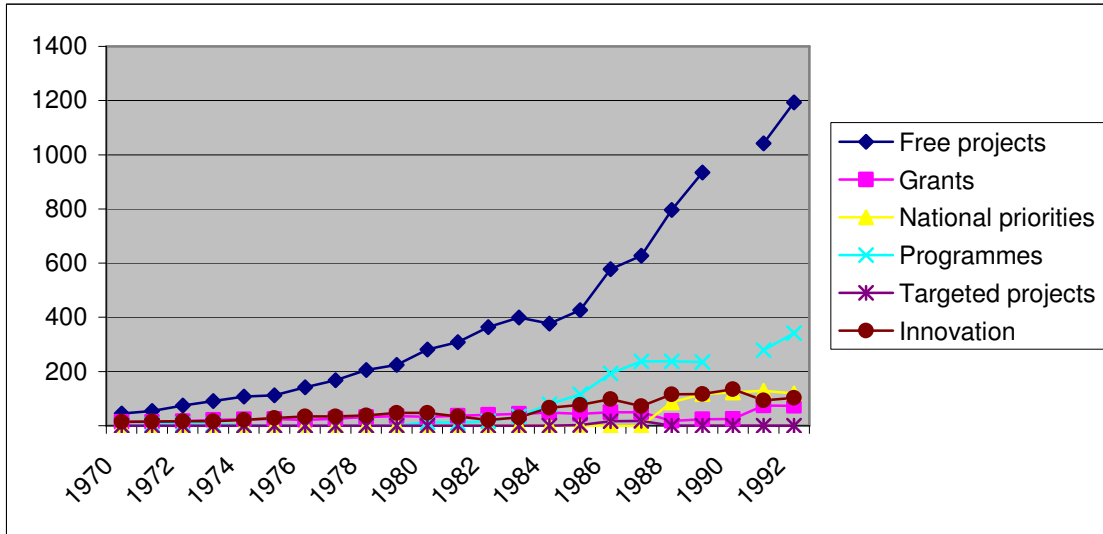
Observations: Dominance of projects. Only lately some new instruments.
 Dominance of projects; is this due to availability of data or real?

Figure x Funding by category of instruments, Swiss research council (SNF)



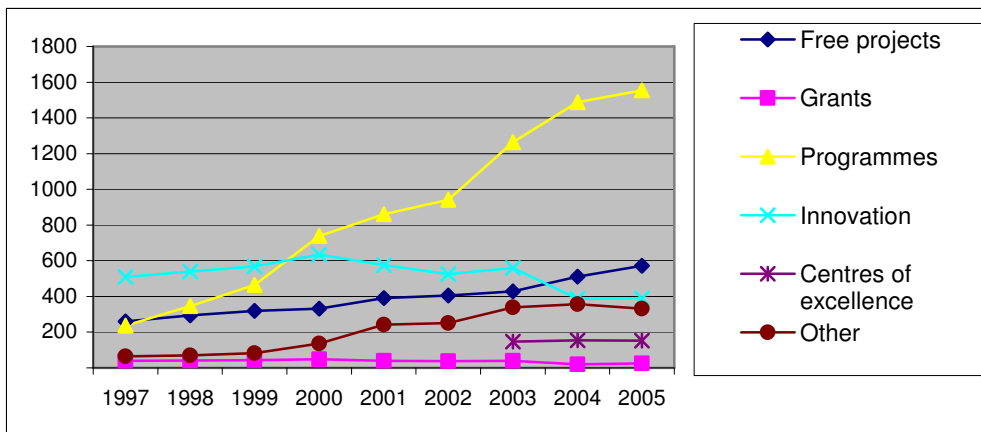
Observations: Dominance of free projects, but also a reasonable share of grants and national programs over the years. Priority programs important in the 90s, networks after 2000.

Figure x Funding by category of instruments, Norwegian research council 1970-1992



Observation: dominance of free projects. Programmes more important from the 80s. Co-existence of other instruments for whole period.

Figure x Funding by category of instruments, Norwegian research council (RCN) 1997-2005



Observations: Increasingly dominance of programmes, reduction of innovation. Centres of excellence as new instrument.

Figure x Research councils' use of (free) projects 1970-2005

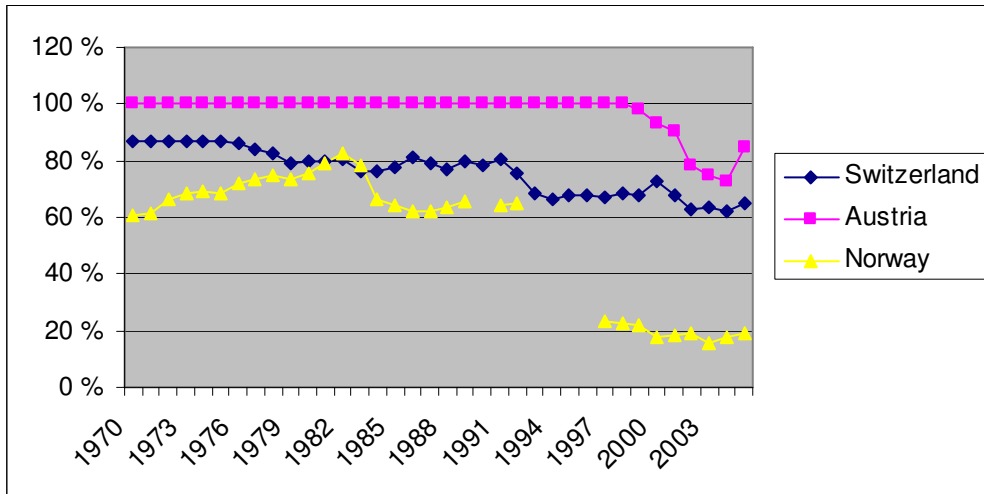


Figure x Research councils' use of grants 1970-2005

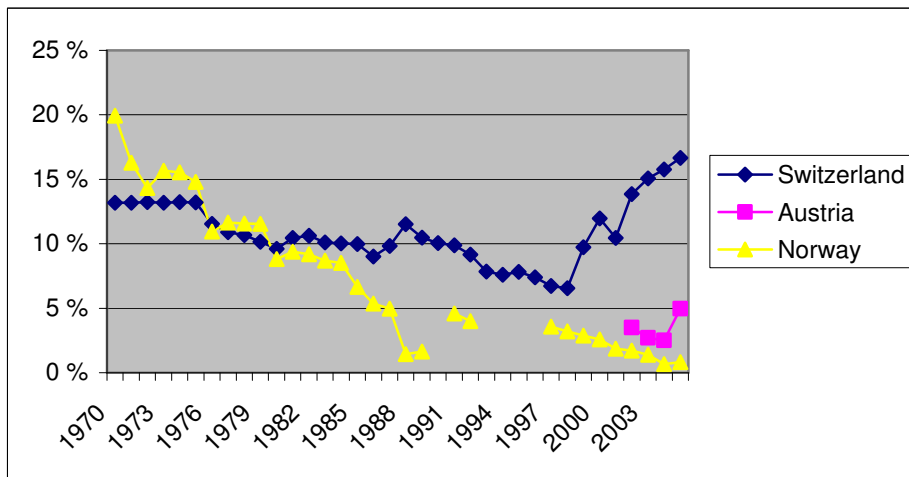
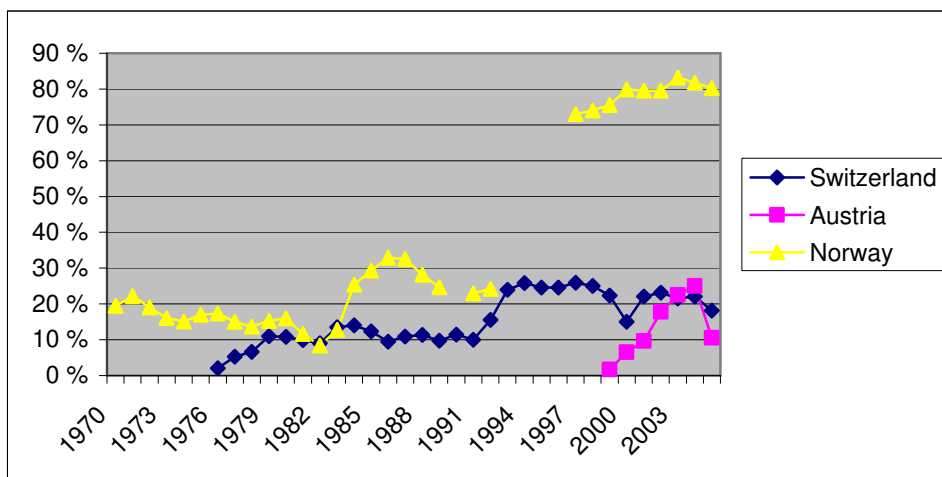


Figure x Research councils' use of programmes and other dedicated instruments 1970-2005



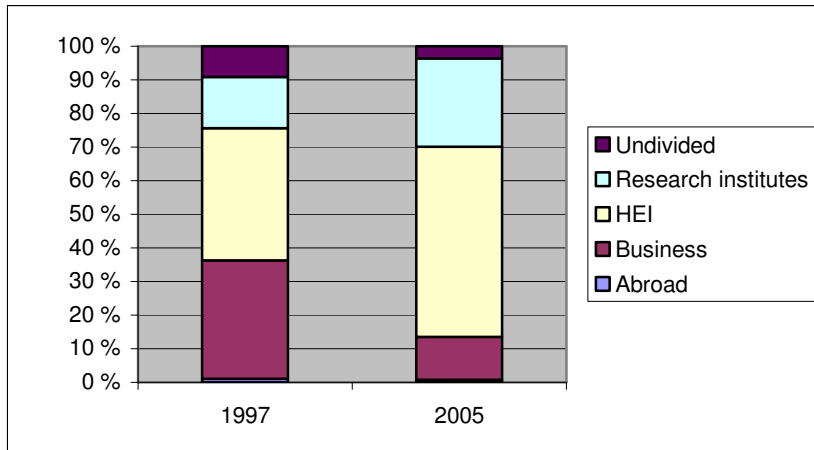
Observations for instruments: Projects the dominant form for all countries until mid 90s. Grants has had a substantial share, but never more than 20%.

Norway: Change from projects to programs by introduction of merged council. RCN has actually stopped giving individual grants.

Switzerland: Increase in use of grants after 1998. **What reasons?**

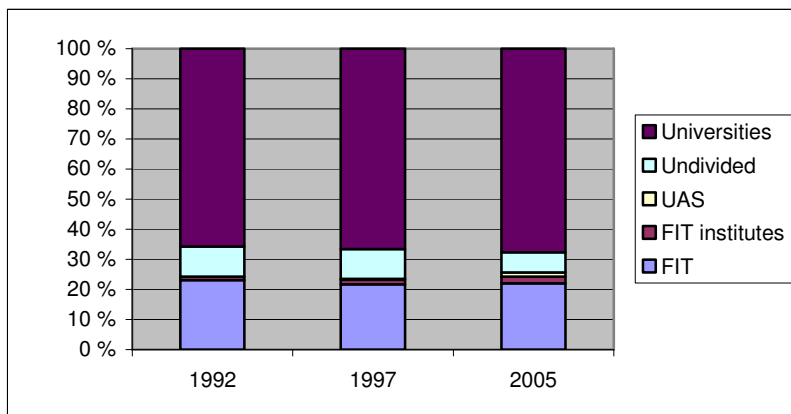
Beneficiaries

Figure x Beneficiaries Norway 1997 and 2005



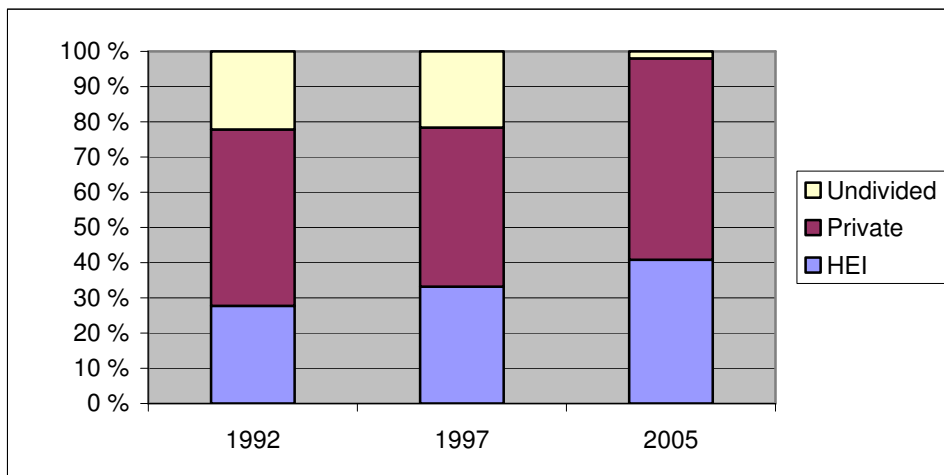
Reduction of business/industry in favour of HEI and research institutes

Figure x Beneficiaries Switzerland 1992, 1997 and 2005



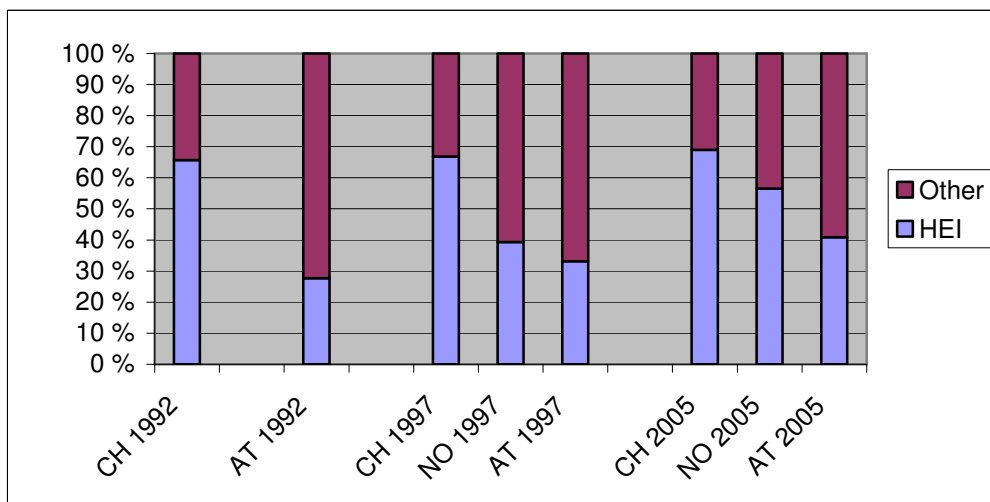
Very stable. Inclusion of FIT institutes and UAS.

Figure x Beneficiaries Austria 1992, 1997 and 2005



Undivided category makes some uncertainty.

Figure x Share by main beneficiaries 1992, 1997 and 2005



Switzerland: Very stable share for HEI
 NO and AT: change in favour of HEI

Overall conclusions from preliminary analysis:

Switzerland

SNF not able to keep its share. What “strategic responses” from the organisation can explain this?

Federal vs cantonal elements? Role of EU funding?

Very stable allocation by instrument and beneficiary.

Conclusion: SNF is mainly responsive to scientists/academia.

Norway:

Prior to merger, councils succeeded very well in obtaining additional resources. Less resources after merger. Policy makers questioned structure of five councils.

After merger: Change of instruments, partly as response to new research needs (larger programmes initiated by scientists and general HEI lobbying), partly initiated by policy makers.

Allocation to beneficiaries changes in favour of HEI. Partly driven by lobbying by HEIs, partly part of restructuring and enlargement of HEI sector.

Conclusion: Councils prior to 1993 responsive to scientists. After 1993 more responsive to policy makers, but still also to scientists.

Austria:

Large increase in funds after 1990. How much is accounted for by restructuring?

Only recent years new instruments. Real or lack of division in data?

Favourable turn towards HEI.

Seems like a stable situation towards end of 1990s. After a major restructuring of Austrian R&D system and funding???

References

- Braun, D. (1998). "The role of funding agencies in the cognitive development of science." Research Policy **27**(8): 807.
- Braun, D. and M. Benninghoff (2003). "Policy learning in Swiss research policy - the case of the National Centres of Competence in Research." Research Policy **32**(10): 1849-1863.
- Dinges, M. (2006). Project funding report - Austria. Wien, Joanneum Research - Institute of Technology and Regional Policy.
- Geuna, A. (2001). "The changing rationale for European university research funding: Are there negative unintended consequences?" Journal of Economic Issues **35**(3): 607.
- Geuna, A. and B. R. Martin (2003). "University research evaluation and funding: An international comparison." Minerva **41**(4): 277-304.
- Laudel, G. (2006). "The 'quality myth': Promoting and hindering conditions for acquiring research funds." Higher Education **52**(3): 375.
- Lepori, B. (2005). Methodologies for the analysis of research funding and expenditures. European Workshop on New Perspectives on Science and Technology Indicators, Lisbon.
- Lepori, B. (2005). Project funding report - Switzerland. Lugano, Università della Svizzera Italiana.
- Lepori, B. (2006). "Public research funding and research policy: a long-term analysis for the Swiss case." Science and Public Policy **33**(3): 205-216.
- Lepori, B., M. Benninghoff, et al. (2005). Changing Patterns of Higher Education Funding: evidence from CHINC countries. Sevilla, IPTS.
- Lepori, B., M. Dinges, et al. (2006). Convergence versus national specificities in research policies. An empirical study on public project funding. Indicators on Science, Technology and Innovation. History and New Perspectives, Lugano.
- Lepori, B., M. Dinges, et al. (2006). Indicators for Comparative Analysis of Public Project Funding. Concepts, Implementation and Evaluation. 9th International Conference on Science & Technology Indicators, Leuven.
- Lepori, B., M. Dinges, et al. (2005). Public project funding of research activities. A methodology for comparative analysis and some preliminary results. S&T indicators for policy analysis: needs, status and new developments, Lisbon.
- Oliver, C. (1991). "Strategic Responses to Institutional Processes." The Academy of Management Review **16**(1): 145-179.
- Potì, B. and E. Reale (2005). Changing Patterns in Public Allocation for R&D: Composition and Evolution of Government Project Funding in Italy". S&T indicators for policy analysis: needs, status and new developments, Lisbon.
- Potì, B. and E. Reale (2006). Project funding report - Italy. Rome, CNR CERIS Section on institutions and research policies.
- Salerno, C., B. Jongbloed, et al. (2005). Changes in European Higher Education Institutions' Research Income, Structure and Strategies. Sevilla, IPTS.
- Scott, W. R. (1992). Organizations. Rational, Natural, and Open Systems. Englewood Cliffs, Prentice-Hall.
- Thompson, P. and D. McHugh (1995). Work Organisations. A Critical Introduction. London, Macmillan Press.
- van der Meulen, B. (1998). "Science policies as principal-agent games - Institutionalization and path dependency in the relation between government and science." Research Policy **27**(4): 397.

van der Meulen, B. (2003). "New roles and strategies of a research council: intermediation of the principal-agent relationship." Science and Public Policy **30**(5): 323-336.