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PUBLIC RESEARCH SECTOR

HIGHER EDUCATION DYNAMICS

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Governance and Performance in the German Public Research Sector

Disciplinary Differences

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Preface and Acknowledgements

In May 2001, a group of scholars from Europe met at a conference on “International Competitiveness and Innovative Capacity in Universities and Research Organisations” at the German Institute for Public Administration in Speyer. The conference which was supported by the German Research Foundation aimed to discuss the reforms and changes in the governance of the German public research sector in the context of the reforms under way in other European countries. This was the starting point for the establishment of the research group “Governance of Research” who set out to analyse the German higher education and research system from a comparative and inter-disciplinary perspective. In summer 2003, the German Research Foundation approved of the funding for the joint research programme, and in 2006 the funding was renewed. Today the research group comprises six projects complemented by a project on the provision of bibliometric data analysis and the speaker’s coordination project. Funding by the German Research Foundation is gratefully acknowledged.

This is the third joint publication of the group which focuses on the question of how disciplinary differences interact with the new forms of governance of research and how these new forms are increasingly becoming implemented into the German research system.

This volume would not have been possible to put together and coordinate for me without the help of Tobias Semmet and Insa Pruisken who supported me as the speaker of the group. Thanks also go to Martina Grammes who helped with the correct use of the English language.

Speyer, Germany
November 2009

Dorothea Jansen

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Governance of Research, Inter-disciplinary Differences and Performance – An Introduction to the Research Programme and the Contributions

Dorothea Jansen

1 Introduction

Since the mid-1990s, universities and non-university research organisations have increasingly experienced pressure from reforms of the public research sector. The low degree of differentiation and stratification in the German university system, the highly autonomous position of professors in research and teaching, and the provision of university education as a public good have been the principles behind the German university sector for many years, but they are going to be lost now. Today, publicly funded research organisations are affected by the concepts of New Public Management (NPM) including management by objectives and target agreements, output control by evaluations, rankings and accreditation, and the introduction of competitive elements such as matching funds, or performance-based university funding and salary models.

The reforms aim to transform universities and research organisations into organisations that are decisive and vigorous in national and international competition. Like the reforms in other Western countries, the reforms in Germany try to realise concepts of New Public Management and the claim for economic relevance of research and education. The reforms transfer concepts of strategic management from private sector organisations to the science system, such as prioritising, generating a critical mass, internationalisation and building alliances and networks (Amaral et al. 2003; Kehm and Lanzendorf 2006a; Jansen 2007a; Matthies and Simon 2008; Paradeise et al. 2009). The changes mentioned above reflect a profound change in the relationship between the state and the science system. For a long time the state was the only actor who funded and regulated universities and other public research organisations. Today, other stakeholders and intermediary agencies such as evaluation and accreditation agencies, funding agencies and university councils with external members from economy and society complement state regulation in the steering of the public research sector.

This new mixture of coordination mechanisms and actors is described by the term “governance”. “Governance mechanisms” are understood here as the model mode of the coordination of actions, for example instruction, trust, identification, mutual observance, or market competition led by market prices (Benz et al. 2007a; Jansen

2007b: 115 ff.; Jansen 2007c: 236 ff.). “Governance patterns” here means a chain of interconnected mechanisms which can be observed empirically. “Governance patterns” can be roughly defined as “complex regulatory structures coordinating the actions of interdependent actors”. Governance patterns can relate to hierarchical as well as to lateral coordination mechanisms. Enforcement can be based on law, professional norms or informal and implicit norms or customs. Moreover, the regulatory structures or individual mechanisms inside them can be established and sanctioned by public as well as by private actors. There is in fact not necessarily an actor in charge of controlling outcomes as for instance in market competition.

In the next section, I will introduce the reader to the changing role of the state in science policy. The third section presents the governance model for the public research sector which was developed by the research group and underlies the contributions in this anthology.¹ The final section gives an overview of the papers.

2 Changes of Statehood and Governance of the Research System

The widespread use of the term “governance” is not only due to real changes of the governmental role, but also to the changed perceptions and evaluations of its actions (Benz et al. 2007b). The reforms of the German public research sector are related to the overall changes of the self-conceptions of the state as well as to the opportunities and tasks attributed to the German state (Braun 2006). From the 1990s onwards the state in terms of self-conception changed from a welfare and intervention state towards a leaner and cooperative state. The tasks attributed to the state, the resources dedicated to those tasks, the modi of accomplishment and the legitimation bases of governing were defined in a different way. In addition, the state experienced a real decline in the tasks it was associated with, for example through privatisations of public infrastructure (Czada and Lütz 2000; Majone and Baake 1996). The decline of state intervention and state activities also reflects the scarceness of public resources including money, human resources, information, knowledge and legitimacy. State actors increasingly realised their dependence on private and societal actors not only to gain legitimacy but also for a successful governance of economy and society. This resulted in an increased cooperation between state, private and societal actors and in a shared responsibility for successful governance (Trute 1999; Trute et al. 2007; Klijn 2005; Skelcher 2005). Next to privatisation and outsourcing of previous state functions the structures of the internal services of the state changed. The New Model of Control (“Neues Steuerungsmodell”) took up the idea of Managerialism and New

¹The inter-disciplinary research group “International Competitiveness And Innovative Capacity in Universities And Research Organizations – New Modes of Governance” was established by the German Research Foundation in July 2003 and renewed in July 2006. The group comprises six projects integrating sociological, political science, economic and legal perspectives on the governance of research and two infrastructure projects for coordination and the provision of performance data. Funding by the German Research Foundation is gratefully acknowledged.

Public Management (Pollitt and Bouckaert 2004). In this perspective, the relationship of politics and administration is considered as an agency problem (Furubotn and Richter 2005) that could be solved through the establishment of output units. These output units were to be responsible for tasks, leadership and resources, and they should represent clear aims of output and outcome as well as corresponding mechanisms of control, incentives and competition.

In this context, science policy, too, is affected by two particular discourses which are used to justify new claims towards science and corresponding policy instruments. First, the discourse on internal administrative reforms has been transferred to the science system. Up to the 1990s, it was considered impossible to govern research and higher education with regard to their contents because of the information deficits of the state (Mayntz and Scharpf 1990). So the state was thought to be able only to fund and provide an organisational framework for science. It was up to the scientific community to coordinate itself. By transferring the new governance model to the science system, administrative and political actors started to use the long-term dependence of scientific communities on organisations (Stichweh 1991) for specific governance aims such as promoting science–industry collaboration or the creation of profiles and clusters within the universities. The most important driving factor was the shortage of public funding for research organisations. State-funded budgets were reduced more and more and research organisations and researchers were referred to third-party funds in order to fund their research. As a consequence since the 1980s, the share of third-party funds in university budgets has been increasing continuously.²

The second discourse affecting the new governance of science deals with the question as to what science can and should do for society. Inspired by neoliberalism, first public administration and later science organisations had to deliver “value for money” to justify their existence. So a new “contract” between society and science was defined and put into practice. According to this contract, science no longer should simply produce knowledge as a public good, systemise it and transfer it to interested users and students, but also care about the so-called “Third Mission”. This mission called universities and research organisations to engage in the production of knowledge and technologies considered to be useful and to transfer useful knowledge and technologies to economy and society. The Third-Mission discourse referred to concepts from science and technology studies such as the postulation of a new mode of knowledge production, the so-called “Mode 2” (Gibbons et al. 1994),

²In 1995, for every €100 in basic funding another €13.64 in third-party funding came in, but in 2005 this ratio had shifted to €21.33. From 2000 to 2005, the third-party funding revenues of universities and medical facilities increased by 29.4%, whereas the basic funding revenues only increased by 6.5% and thus, taking inflation into account, decreased in real terms. However, the expenditures of the German Länder for the German Research Foundation increased by 16.5%. A little less than a third of the third-party funds for universities comes from industry (Wissenschaftsrat=WR 2008). Moreover, the share of the individual grants programme which the German Research Foundation spent next to coordinated grants programmes has decreased also in real terms (2003: 35.1%; 2006: 31.9%, cf. WR 2008: Table 4, p. 27).

or the Triple Helix (Leydesdorff and Etzkowitz 1996), a research alliance of public (large) research organisations, universities and industry. Both approaches share the view that “customers” of science should have more influence on organisations and contents of research. These concepts fitted well to policy aims and became part of the reform concepts more or less without having been confirmed by empirical evidence (for a detailed analysis of the changes in the governance of research cf. Jansen 2009b).

To cope with the various mechanisms that have been newly introduced by these discourses and respective policies into the science system, an empirically productive analytic taxonomy of governance mechanisms of science is necessary. This taxonomy has to integrate the elements of New Public Management, elements of the former university governance, and the coordinating elements of scientific communities being developed inside the science system. Such a taxonomy was developed by the research group “Governance of Research” which closely watched the reform process of the German science system over a 6-year period in its previous work (Jansen 2007a, 2009a). Section 3 introduces this model as the theoretical background of the papers collected in this anthology.

3 An Integrated Model of Governance of Research

The following model of governance of research is based on the assumption that governance mechanisms and the way they are bundled in governance patterns influence the output of the research system. Governance patterns have direct effects on the resources, capacities and skills of research organisations. The model looks into those governance mechanisms that have effects on research organisations from the outside such as state regulation and funding or quasi-market competition for third-party funding. It complements this view from the outside with mechanisms of internal steering of research organisations, such as academic self-organisation and hierarchical self-management. Finally, the traditional mechanisms of coordination within the scientific community have to be taken into account.

Our conceptualisation of governance of universities and research organisations started with the mechanisms of the old governance of universities: state regulation including state funding combined with input-control and academic self-organisation. The New Public Management model was operationalised by the quasi-market competition for research funding and the establishment of strong hierarchical self-management within the organisations (university presidents, deans etc.). External guidance by the state and other stakeholders (steering at a distance) was thought to replace strict state regulations. Intellectual ex post coordination by the scientific community, horizontal coordination by research collaboration networks, cultural orientation, and self-conceptions of different research institutions such as the Max Planck Society or the Fraunhofer-Gesellschaft were identified as governance mechanisms coordinating research within the scientific community (Gläser 2004; Gläser and Lange 2007; Wald and Jansen 2007; Schimank 1999) (Fig. 1).

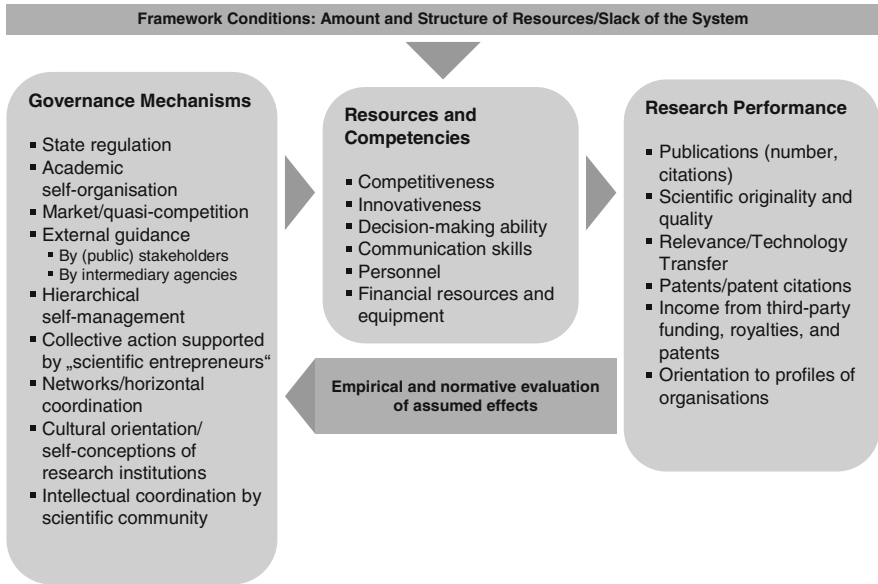


Fig. 1 Theoretical framework of the research group

Our previous research clearly showed that in the course of the reforms a mixed system came into being (de Boer et al. 2007; Jansen 2007a; Kehm and Lanzendorf 2006b). New forms of external governance were indeed added to the traditional governmental regulation. The term “external guidance by stakeholders” describes mechanisms such as target agreements of German Länder and universities or the creation of advisory councils for universities and research institutes as instruments of interest intermediation of public and non-public stakeholders with respect to the governance of these organisations. Seemingly such agreements and proposals are negotiated and exchanged between coequal partners. However, research organisations were actually confronted with Hobson’s choice. Proposals given and contracts offered by newly established and old principals of universities and research organisations could hardly be turned down. In addition, the new quasi-markets for students, third-party funding, and performance-based budgets are organised by old and new intermediary agencies, for example the German Council of Science and Humanities (WR = Wissenschaftsrat), the Institute for Research Information and Quality Assurance (iFQ), and accreditation agencies.

Concerning internal decision structures in universities and research institutions, we again found evidence of the parallel existence of hierarchical self-management and traditional academic self-organisation and a decoupling of management in the books and actual behaviour of academics. In addition our empirical studies showed the emergence of an informal but successful mechanism of academic coordination providing collective action in order to generate a research-related collective good (e.g. research training groups, inter-institutional cooperation). Some scientists

turned into scientific entrepreneurs that were able to create an innovative coalition and to overcome strong internal and external obstacles (Sadowski et al. 2008; Schneider et al. 2010 in this volume; Heinze and Kuhlmann 2007, 2008).

Already since the 1980s, the competition for third-party funding had been playing an important role among individual researchers and research teams. By the so-called Excellence Initiative, new standards for the resource level of university research and the management of universities were established in 2005 in Germany. Universities for the first time were addressed by a funding programme as organisational actors that were called to organise research applications at the central level. Thus, universities increasingly changed to a proactive management of research in order to assure a steady stream of applications for third-party funding. This is also a reason for the hardening of the competition for third-party funding in general. The allowance quota for individual project grants (the so-called *Normalverfahren*) by the DFG (German Research Foundation) decreased from about two thirds in 1995 to less than 50% in the beginning of the first decade of the twenty-first century; in 2007 it amounted to 52.5% (DFG 1998: 50; DFG 2008: 138). At the same time, the share of the individual project grants in the overall budget decreased from 35.1% in 2003 to 29.3% in 2007, whereas the share of coordinated programmes increased from 48.9% in 2003 to 54.6% in 2007 (DFG 2008: 138; WR 2008: 27).

At the beginning of the reforms in Germany, evaluation of higher education and research was of little importance. In particular, research performance was represented little in evaluation schemes and funding formulas compared to indicators measuring teaching performance. If so, formulas mostly used the indicator of third-party funding which is not an indicator of research output and has problematic unintended effects on research performance (Jansen et al. 2007; Schmoch et al. 2010). However today, an increasing institutionalisation of evaluation, rankings and ratings has emerged (DFG 2003, 2006; WR 2008, 2004). New forms of competition for students, for third-party funds at the level of universities, for formula-based funds from the Länder, as well as for positions in ratings and rankings were established. These new forms were added to established forms of competition such as competition for reputation and competition for research funds at the level of individual researchers and research teams. Since quasi-markets such as calls for tender by the state or competition in teaching or research performance lack clear-cut price signals, new arrangements for these markets have to be found. Frames for the regulation and management of these new forms of competition were established by new types of intermediate agencies and were authorised to set up frames for regulation and management of these quasi-markets, such as sets of indicators for the evaluation of research and teaching or standards for the accreditation of study programmes. Such intermediaries today indirectly complement the direct mechanisms of state regulation by fulfilling the following functions:

1. Engaging in the definition of coordinated competitive funding programmes (call for tenders) in science-policy discourses (interest representation, interest intermediation). Typical actors here are disciplinary associations, science organisations such as academies or the scientific societies (Max Planck Society,

Helmholtz Association, Fraunhofer-Gesellschaft, etc.) as well as established funding agencies such as the DFG and advisory councils (e.g. the German Council of Science and Humanities).

2. Implementation of competition programmes with different levels of freedom of research and its independence from state intervention (e.g. the joint management of the call for the Excellence Initiative by the DFG and the German Council of Science and Humanities), and
3. The definition and safeguarding of quality standards for competition (e.g. Länder-specific evaluation and accreditation agencies, advisory boards and the newly established Institute for Research Information and Quality Assurance).

Next to the competition for resources less formal governance mechanisms such as self-coordination influence the external relationships of researchers. A lateral internal self-coordination is driven by research networks as an *ex ante* mechanism of coordination and the joint orientation towards patterns of interpretation having built a collective background of experience. External coordination results from self-concepts and the status received by membership in influential networks, which guide the search for appropriate research partners. In Germany, such cultural self-concepts and orientation in research have formed the so-called domain consensus (Schimank 1999). The differentiation of profiles of research organisations has, however, been reduced because of the reforms in the science system and the opening of the quasi-markets for research funding. Self-concepts and the identification with a specialised research community also cause impersonal *ex post* intellectual coordination through mutual observation. This is supported by the scientific communication and publication system. In this system, the decisions about scientific relevance are made and incentives for following specific research questions of high relevance are provided. Moreover, research reputation is allocated via the communication system which informs decisions in relation to the appointment of scholars or the choice of collaboration partners. Thus, a differentiation by reputation emerges and scientific elites emerge.

4 Introduction to the Research Programme and the Contributions in This Volume

The point of departure of this volume is the evidence of huge differences between the disciplines with respect to their input, throughput, profiles of output and the typical conditions of knowledge production (Jansen et al. 2007; Schmoch and Schubert 2008; Schmoch et al. 2010). However, these differences are still little understood and are not reflected in science policy and the implementation of new governance forms in the research system. By and large, a policy of “one size fits all” is typical for the design of evaluation schemes, systems of performance indicators and performance-based allocation of funds. This anthology aims to shed some light on the differences between disciplines. In particular we want to explore the differences

in the actual governance structures that have emerged from the recent reforms in the research system and how these affect the knowledge production and research performance at the level of research groups and at the system level.

The volume is structured into three parts and an appendix. The disciplines studied in the assembled papers were chosen for the joint research programme of the research group “Governance of Research”. They represent natural science fields oriented to basic research (astrophysics), two application-oriented fields from the natural sciences (nanoscience and biotechnology), a social science field (economics) and a humanity field (medieval history). For those fields that are covered in bibliometric databases (SCI, Scopus), the appendix presents detailed descriptions of publication and – in the case of application-oriented fields – patent data, data on research promotion and on institutional structure of the fields in Germany and their international integration. Since for humanities comparative standardised data are hard to find, available data on funding and the development of academic staff numbers are described in Chapter 4 which is devoted to the governance effects on research in medieval history.

Part I deals with the effects of the implementation of New Public Management governance mechanisms such as the increase of competitive third-party funding and hierarchical self-management of universities and research organisations on the research system from a system’s level perspective. Schubert and Schmoch pose the question whether research performance at an individual level is enhanced by NPM reforms, and whether the changes that result from the new incentive structures will lead to a sustainable long-term performance at the level of the research system. On the basis of a large empirical data set covering a variety of disciplines (astrophysics, nanotechnology, biotechnology, and economics), they raise reasonable doubts that the evaluation schemes and systems of the implemented performance-based allocation of funds will help to create a long-term high performing research system. Broemel, Pilniok, Sieweke and Trute look into the changes of the governance patterns of the research system from the perspective of science law. They determine contradictions between the traditional legal conception of the science system where there was no need to look into the peculiarities of disciplinary differences in the process of knowledge production, and the NPM reforms that have been established in the German research system in the last decade.

Part II assembles two papers that look into governance effects on research and performance for selected disciplines in more detail. Jansen, Heidler and von Görtz cast doubt on the concept of a new Mode 2 of knowledge production and exemplify this with a detailed comparative analysis of research teams from nanoscience, astrophysics and economics. However, the concept is readily taken up by science policy, since it fits well to the NPM instruments and to the discourse on science having to deliver “value for money” and to be engaged in a “Third Mission”. Again negative effects of new governance instruments at the individual level of research teams can be shown. In Chapter 4, Kehm and Leiðytė present data from four qualitative case studies of medieval research comparing Germany, England, The Netherlands and Austria. They question the widely felt crisis in the humanities, and in particular a harsh decline in funding and staff cannot be verified. However, the competition for

funding, the need to integrate one's research into priority funding programmes and larger often inter-disciplinary research units are understood by some researchers – mostly the older and established ones – as signals of crisis. Younger researchers cope quite well with the new challenges. Larger and inter-disciplinary research environments may even open up chances for unorthodox research and scientific entrepreneurs. The attention paid to medieval history research from the public, from a variety of funders and from research organisations interested in sharpening their profiles has even increased. Nevertheless, there is also a lot of symbolic compliance and window dressing to match one's own research interest to the priorities of funders and institutions.

Part III deals with the new governance mechanisms in PhD education. Unger, Pull and Backes-Gellner study the performance of German research training groups funded by the DFG using their reports on research performance to the DFG. Schneider, Thaller and Sadowski present evidence from comparative studies of PhD-programmes of 14 economics departments from Germany, the Netherlands, Switzerland, Italy, France and Great Britain. While the focus of the latter study is on the comparison of structured PhD-programmes to the traditional master–apprenticeship model, the study by Unger et al. enquires on the effect of disciplinary affiliation (humanities and social sciences versus natural and life sciences) of the training groups. The comparison of outputs of research training groups from the different fields again reveals large differences in publication forms and type and in the degree of inclusion of doctoral students in conferences and article writing. However, there is no significant difference in completion rates. The study by Schneider et al. (2010) is based on the theoretical sampling of economics departments according to their research intensity and the type of PhD-programme (structured collective education vs. individual master–apprenticeship relations). With complex Boolean combination logic the authors identify those conditions that characterise departments with an academic placement above average compared to those with an academic placement below average and disentangle the relationship between necessary conditions and sufficient ones. An important result is the utmost importance of the emergence of a coalition of faculty staff who is willing to contribute extra effort to the running of a PhD-programme. Combined with some slack in time budgets such a coalition of academic entrepreneurs can even overcome a lack of funding whilst all cases of below-average placement success are characterised by the lack of entrepreneurial spirit and effort.

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