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***Funding Systems
and Their Effects on
Higher Education Systems***

COUNTRY STUDY – DENMARK

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Executive Summary

The funding system of Danish Higher Education Institutions (HEIs) is under rapid change. More or less all aspects of the existing funding system, including the three main sources with respectively the taximeter model; the basic grants and the external grants, have recently been reformed or will be reformed in the near future. At the present time, a merging of HEIs is taking place.

The first component of the funding system, the taximeter principle as such - applied in education - is considered as being well-functioning. The system has clear advantages as it states direct demands on quantity and indirect requirements on quality in higher education, and despite its shortcomings, several stakeholders point out that a better system yet has to be presented. However, a number of key stakeholders also emphasise that in general there is room for substantial improvements. It is in particular emphasised that there is a problem with the actual taximeter-rates. First of all, the basic rates have been repeatedly cut during the last decade (some of the cut funds have though been returned to the HEIs in other forms of revenues), and secondly the system has been criticised for lack of balance and a clear rationale in the allocation of resources between the different educational areas.

The second component of the funding system, the basic grants, is perceived as being of great importance to the budget security of institutions and to enabling them long-term planning. In addition, the basic grants are significant for structural changes and are the foundation for HE institutions possibility to be flexible and adaptable to changing conditions. Finally, these grants are important for the quality and outcome of basic research. However, a number of stakeholders also point to problems with the existing allocation system of basic grants. It is in particular pointed out that the lack of use of performance parameters weakens incentive mechanisms and limits quality assurance. Another important unintended effect mentioned is the apparent large share of basic grants tied to co-financing of external projects. Accordingly, the factual amount of free funds at HEIs is more limited than assumed.

Finally, as regards the third major component of the funding system, the external research grants, it is as a general rule acknowledged among all stakeholders that competition raises quality when grants are given to broad areas and in large shares, and that competition enhances applicability and collaboration. However, it is also emphasised that the current allocation of competition grants is often focused on areas that are too narrow in scope. Moreover, it is claimed that such grants - in many cases – do not promote originality, creativity and novelty. It is argued by many stakeholders that an increased proportion of competition grants (as it is expected to be introduced in the near future) will limit the possibilities of long-time planning for the HEIs and force them to focus on areas where funding is available rather than on areas where institutions have high competence. An apparent effect might well be that strategic management of the universities will be moved from the institutions to the funding agencies and organisations.

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1 Introduction

Danish Higher Education (HE) has seen a number of significant changes in recent years. These changes have not only influenced the funding-system, but also almost all other aspects of HE. The funding of research of Higher Education Institutions (HEIs) has been targeted through a major reform of the second tier of the research funding system: the allocation of external grants. In addition, the most recent University Act from 2003 aims to further increase the universities' autonomy and self-governance; most notably by the introduction of a board with an external majority as the superior authority of a university, employed leaders instead of elected, and an explicit demand for interaction with society. This reform has not directly targeted the funding of HEIs, but the changes will definitely impact funding decisions as the Act emphasises that the universities' new management should make strategic selections of research and educational areas and give high priority to these areas (Ministry of Science, Technology and Innovation, 2003a).

Further changes of the funding system can be expected in the near future. The Danish Government has recently presented a comprehensive strategy dealing with the challenges of globalisation. The Globalisation Strategy was presented in March 2006 (Statsministeriet, 2006). According to the strategy, Denmark have to develop a (1) world class educational system, (2) strong and innovative research, (3) more entrepreneurs and (4) more innovation and change. The funding of HE is given high priority in the new strategy. Among the most important initiatives in this respect are proposals of a higher proportion of university funding in the future to be allocated through competition, and that the allocation of basic grants are to be linked to performance. Furthermore, the Government intends to simplify the taximeter system and hence the funding of education substantially as well as strengthen financial incentives for the institutions to reduce drop-out rates and shorten long completion times. The government is at present working on merging of universities and government research institutes.

2 Results

2.1 Main Features of the Funding System of Higher Education

Three types of Higher Education institutions

There are 12 University Institutions operational under the current University Act. This includes five multi-faculty universities that conduct research and offer bachelor, master and PhD programmes as well as master programmes for adults. Furthermore, there are six universities with only one faculty that conduct research and offer educations targeting a few, clearly defined professions within technology, agricultural, business and veterinary sciences, pedagogy and pharmacy. Finally, the Business School in Copenhagen has two faculties in business and languages. All institutions offer education and conduct research under the jurisdiction of the Ministry of Science, Technology and Innovation.

At the moment, the institutional structures are in the process of transformation. The Government has presented a plan to reduce the number of institutions by merging universities and government research institutes. The aim is to strengthen education as well as research and thereby sharpen the profile of Danish universities and improve their competitiveness (Statsministeriet, 2006). Table 1 illustrates the present structure of the Danish Universities.

Table 1. Danish Universities 2004/2005.

	Hum.	Soc.	Tec./ Nat.	Health	Students	PhDs	Researchers	Founded
University of Copenhagen	•	•	•	•	32819	1339	2.296	1479
University of Aarhus	•	•	•	•	23343	820	1.606	1928
University of Southern Denmark	•	•	•	•	15809	416	879	1966
Roskilde University	•	•	•		8978	208	507	1972
Aalborg University	•	•	•		13638	564	1.154	1974
Technical University of Denmark			•		6274	673	1.435	1829
The Royal Veterinary & Agricultural University			•		3117	391	968	1858
Copenhagen Business School	•	•			11647	176	208	1917
The Aarhus School of Business	•	•			5522	65	457	1939
The Royal Danish School of Pharmacy			•		1183	108	233	1892
The Danish University of Education	•				2728	88	230	2000
IT University of Copenhagen			•		1432	46	97	2003

(Source: Rectors Conference, 2005)

A second group of HEIs consists of a large number of non-research based institutions offering tertiary educations. These institutions are under the jurisdiction of the Ministry of Education. With the presentation of the Globalisation Strategy, the Government has expressed an

aim to reduce the number of independent institutions. The objective is to gather all current educations in this category in 6-8 regionally based institutions (Statsministeriet, 2006).

Finally, there is a third group of 20 institutions under the Ministry of Culture offering tertiary educations within the sphere of culture (academies of music, theatre schools, fine arts, design schools, school of library and information science, schools for architects etc.). Among these a few offer educations on master level, conduct research and have PhD-schools.

Types of HE funding

Funding of teaching and research are separated in Denmark. Accordingly, HEIs receive separated budgets for teaching and research. In general, the most important source of funding for HEIs is the subsidies provided for by the state in the annual appropriation acts and the additional appropriation acts provided by the end of each year (Ministry of Science, Technology and Innovation, 2003b).

Funding of education: the taximeter-principle

The Danish HE sector receives funds from the Ministry of Education to provide education. The HEIs are funded through the taximeter system, which links funding directly to the number of students who pass their exams. The teaching component is based on a unit-cost principle, where an amount of money is paid to the university for each student who passes an exam. Each exam is weighted in this system and the weights of all exams of a 5-year programme add up to 5. An important feature is that universities do not receive compensation for students who fail their exams or do not take exams. The tariff paid per passed exam, the 'taximeter', varies substantially between different fields of study, and has three components, which includes costs of education and equipment; joint costs (e.g. administration, buildings) and costs for practical training (applicable only for a few subjects). The current tariffs are predominantly historically determined. However, taximeter-tariffs are adjusted annually to balance the budget of the Ministry of Education. Currently, the basic tariffs of university educations vary from 3.240 Euro to 4.350 Euro for most educations in the humanities and social sciences and from 5587 Euro to 8307 Euro for most educations in natural sciences, technical and health science (Finansministeriet, 2005). These figures are, according to the Rectors Conference, quite low compared to other types of education in Denmark as well as to university educations in countries which the Danish Government has expressed ambitions to compete with (Rektorkollegiet, 2003).

Although the taximeter grants and the associated subsidies are assumed to cover the various types of expenses, there is no direct link between subsidies and consumption. Because of principles of lump sum granting and the self-governing nature of the institutions, the universities are free to move their funds between education, research and joint expenses and internally from one education purpose to another. In reality, the universities distribute their grants according to their own internal principles, thus reflecting the principles and incentives

of the taximeter scheme to varying degrees (Ministry of Science, Technology and Innovation, 2003b).

All Danes from the age of 18 are entitled to public support to further education, regardless of social standing but with a reduction of the grant depending on their income. The actual State Educational Grant for most students is app. 630 EUR/month (the most generous among the OECD countries, with an income limit of 800 EUR/month) and the state guaranteed loan at app. 320 EUR/month (Finansministeriet, 2006).

Quality assurance in education

The Danish Ministry of Education has early acknowledged the risk of decreasing quality as a consequence of an output-based funding system and in 1992 established an evaluation centre, namely the Danish Evaluation Institute (EVA), which performs regular evaluations of the educational programmes. EVA is funded by the Ministry of Education but is an independent body with the task to conduct evaluations and publish them and thereby maintain and further improve the quality of higher education. A negative evaluation has no direct financial consequences for the institution, but in principle the Minister can intervene if performance is not improved.

Another counterforce to the erosion of academic standards is a long-standing system of external examination. The main tasks of the external examiners are to ensure a fair and equal treatment of all students; monitor nation-wide quality standards; advise the institutions on the quality of the programmes, and annually submit a report to the institutions of their impressions or critical points.

Funding of university research

Denmark has a two-tier system for resource allocation to research. The first tier is the basic grants allocated by the different ministries directly to the institutions. The second tier comprises resource allocation from the National Research Councils, strategic research programmes, and foundations, R&D funds from the different ministries, and private funds and firms.

The first tier - basic grants

The basic research grant is allocated as a lump sum to the institutions. The level of the basic grant is to a very large extent calculated on an incremental basis. Basic grants are free in the sense that they are not earmarked for specific research purposes. Contrary to most of the other grants and sources of income of the universities, the basic grants are therefore allocated as a predominantly non-specific activity related grant. The distribution of the grants between the universities is relatively permanent and based on historical aspects. Budgets are in general characterised by the fact that they take into consideration factors such as freedom of research, budget stability and historical traditions. However, two aspects offer a somewhat

varied picture of the static characteristics of the basic research grants. First of all the grant is affected by fluctuations in the overall framework conditions of the Ministry, which includes the general demands for higher efficiencies and more savings presented by the Government in connection with the annual Finance Acts. Secondly, new research grants to the universities are to an increasing degree distributed according to models relying on activity parameters. This means that there is a certain degree of intra-university re-distribution of the funds and that part of the grant contain some degree of activity dependency to create expedient incentives. Each year 2% of the basic grants to public institutions such as universities is retained for productivity improvements. This share is returned to the universities via the 50-40-10-model (Ministry of Science, Technology and Innovation, 2003b). Allocation of resources is made as follows: 50% according to educational grants, 40% according to subsidised research and 10% according to the number of awarded PhD degrees.

The second tier - external grants

The universities have considerable revenues in addition to the basic grants and the taximeter grants. Partly in the form of subsidies from research councils, the EU, private foundations and donations etc., partly in the form of operating income obtained in return for services they have sold on market terms. Both groups of revenues are dependent on performance in the sense that the size of these revenues is directly related to the ability to attract subsidies from external sources in competition with other research institutions and the ability to sell services on market terms. The grants of the second tier are given for shorter periods of time, partly on the basis of project proposals, partly by tender for research activities specified by the granting institutions. In Denmark most researchers, who wish to conduct research in cooperation with international teams, are forced to seek funding from the second tier in the two-tier system, where competition is fierce.

An essential part of the second tier is the research council system which plays an important role in the external funding of the Danish universities (Ministeriet for Videnskab, Teknologi og Udvikling, 2004, L 142). The research council system has since 2004 been driven based on the one hand on the so called “bottom-up” principle – implemented by the Danish Councils for Independent Research and the Danish National Research Foundation – and on the other by top-down, politically prioritised funding allocations – implemented by the Danish Council for Strategic Research and the High Technology Foundation.

The Danish Research Council for Independent Research is the governing body of five research councils. Each of these councils consists of 15-20 members, which are recognized researchers, appointed by the Minister of Science, Technology and Innovation. Depending on the economic size of the research proposals the councils may occasionally use external peer reviews in their assessments and decisions.

The Danish Council for Strategic Research is headed by a board of 8 members with the majority being recruited from the private sector. The council’s main objective is to ensure the implementation of research in politically prioritized areas. The board does not have compe-

tence to allocate grants. Instead the council works through ad hoc programme committees for each strategically chosen programme. The committees dissolve after completion of the assignment.

The Danish National Research Foundation is an independent foundation, which aims at strengthening Danish frontier research. The Foundation's primary strategy is to set up and fund Centres of Excellence. Since 1991, the Foundation has supported Danish research environments with more than 3 billion DKK. Finally, The High Technology Foundation supports research and innovation based on public-private collaborations and have a special focus on nanotechnology, biotechnology, ICT or the border-areas between these fields. The majority of the app. 30 million Euros, allocated by the foundation this year, will be directed to large high technological initiatives, while a smaller proportion of the funds will be directed to initiatives including small and medium-sized companies. The foundation finances up to 50% of the expenses of the selected initiatives.

In addition to these sources of external grants, funding can also be achieved from private funds, firms and organisations. In 2004, app. 13 percent of the total research funding came from private funds, firms and organisations (Danish Centre for Studies in Research and Research Policy, 2006). Table 2 illustrates total R&D expenditures for higher education and the proportion of basic and external grants per research theme.

Table 2: R&D-Expenditures for HEIs in 2004, in million DKK.

	Basic grants	External grants	Total	Ext.share (pct.)
Natural sciences	1.430	811	2.241	36%
Technical sciences	725	427	1.152	37%
Health sciences	1.265	1.138	2.402	47%
Agr./veterinary sciences	319	180	500	36%
Social sciences	1.055	270	1.325	20%
Humanities	1.027	265	1.291	20%
Total	5.821	3.091	8.912	35%

(Source: the Danish Centre for Studies in Research and Research Policy, 2006)

During recent years, resources from budget reductions, namely 2% of the “taximeter” cuts, have been used by the Government to re-alignment and conversion schemes. According to the Ministry of Science, Technology and Innovation, resources from budget reductions have been reallocated back to the universities again in a different form of returns.

2.2 Formal, Explicitly Stated Interrelationships between the Funding System and National Higher Education Policies

The funding system as a whole

In terms of financial management Danish HEIs have during recent years been characterised by economic decentralisation, and an increased application of activity steering incentives. The University Act from 1993 introduced economic decentralisation for the universities, and this principle has been further emphasised in the most recent University Act from 2003. The intention of the decentralisation is to promote economic responsibility and make better use of resources (Ministry of Science, Technology and Innovation, 2003a).

Funding of education

The intention of the taximeter principle – linking money to student activities - is to give HEIs an impetus to demonstrate user-friendly behaviour towards the students. In order to achieve the highest grants, universities need motivated and qualified students that pass their exams and complete their education in the period of time prescribed for their studies. In the governmental report from 1998 on the taximeter-model key-arguments for the reform were formulated as follows (Ministry of Research and Information Technology, 1998):

- to promote efficiency, and induce educational institutions to become more results-oriented and customer-focused;
- to link the allocation of grants to educational production so that schools with more students and better results are rewarded accordingly;
- to avoid erosion of standards;
- to implement a system that is simple, fair, transparent and automatic;
- to promote quality competition among HEIs.

Funding of research

The first tier - basic grants

The basic grants are research appropriations allocated to secure the core research activities of HEIs. Basic research grants are allocated with regard to budget-stability, freedom of research and historical traditions. A high degree of budget stability enables the institutions to plan and steer the research activity. However, a small part of the funds are already now activity-dependent, and further changes in the direction of increased activity-dependency can be expected in the near future (see other results further below).

The second tier - external grants

With the most recent reform of the research council system and the allocation of external grants, a number of overall targets were stated (Ministry of Science, Technology and Innovation, 2003c).

The reform aimed to:

- ensure quality of research through open competition for all public research appropriations, which are not basic funding;
- simplify the organisation and structure of councils, bodies and especially programme committees to provide researchers with a better overview of application options;
- ensure with a stronger management that strategic research is implemented on its own terms and that cross-disciplinary efforts within all areas of research are considered;
- continue to ensure support of basic research activities;
- ensure support of strategic, application-oriented and business and industry-aimed research activities;

The new council system is accordingly expected to evaluate the quality of all projects in connection with the awarding of public research funds, with the exception of basic funding to research institutions. This is expected to guarantee a coherent expert evaluation of research appropriations and special allocations under the individual ministries responsible for HEIs.

2.3 Intended and Unintended Effects of the Funding System on Higher Education and on the Core Tasks Teaching and Research

A key point in the debate of the design of the Danish funding system of HEIs is the question of finding a balance between input-based and output-based funding. Output- or performance-based funding is considered to be more efficient than an input-based system. In input-based systems, HEIs do not have an incentive to supply education or research at the lowest possible costs, but on the other hand this type of allocation secures the institutions a known base of funding and facilitates long-term planning. Output-based systems, in contrast, provide high-powered incentives to deliver the output at the lowest cost. The important pros of output-based funding are promotion of efficiency, transparent allocation of public funding, no requirements on production technology are imposed (e.g. staff-student ratios) (CPB, 2001).

However, output or performance-based funding has some weaknesses too. Output-measurement difficulties could lead to misalignment of incentives; “cream skimming”. Also, output-funding may not function according to intentions when institutions do not have (enough) control over the performance measures, when the relation between effort and performance measures is unclear. Finally output-based funding typically works poorly in cultures dominated by professional norms that denigrate speed and quantity of output relative to the quality, challenge, thoroughness or creativity of the work done. In addition to these cons, it should be mentioned that output-based funding can result in fluctuations, which make it difficult for institutions to make long-term planning and offer staff job-security (CPB, 2001).

Funding of Education – intended and unintended effects of the taximeter system

The strengths and weaknesses of output-based funding have been discussed repeatedly in relation to the Danish taximeter system and a number of investigations and evaluations of

intended and unintended consequences of the system have been carried out in the last decade. It is argued that the taximeter principle is a funding system, and that accordingly it is not the main aim of the system to directly regulate the quality of education. Instead, quality should be safeguarded by other measures (Ministeriet for Videnskab, Teknologi og Innovation, 2004). Nevertheless, the debate on quality is often linked to the taximeter system.

The first major evaluation of the taximeter system was performed in 1995, where the Ministry of Education asked the EVA to assess whether the taximeter-model had any negative effects on educational quality. It was concluded that no negative trends could be found in the most recent evaluations of the study programmes (CPB, 2001).

In 1998, a second and much broader evaluation of the taximeter model took place. The evaluation covered higher education institutions as well as other parts of the educational system and other government sectors where the taximeter-principle was applied (Undervisningsministeriet, 1998). Also in this evaluation the overall conclusions were positive. It was emphasised that as a result of the reform, the management of the education sector had improved considerably, resulting in an increased focus on “value for money”. Unprofitable activities were more rapidly discontinued, and the institutions had improved their ability to adjust and take new initiatives. It was also concluded that institutions seemed to be more inclined to provide a good service to their students. Furthermore, it was emphasised that most institutions considered the quality of their teaching programmes to be the decisive factor in the competition process. These effects were found to be more pronounced at the vocational colleges than at the universities. One of the reasons could be that university funding is less affected by fluctuations in the number of active students, since taximeter-grants cover only about a third of their total revenues (CPB, 2001). In spite of these conclusions, the critique of system has continued, and as a consequence further evaluations have been carried out. The most recent evaluations have been carried out in 2004 and 2005, but the conclusions of the previous evaluations have more or less been repeated in the recent reports (Undervisningsministeriet, 2001 & 2005; Ministeriet for Videnskab, Teknologi og Innovation, 2004).

Funding of research - intended and unintended effects

The above mentioned strengths and weaknesses of input-based and output-based funding types have also been debated repeatedly in relation to the funding of research at HEIs.

The first tier - basic grants

Basic research grants secure the institutions long-term planning and steering of activities. Furthermore, the basic grants enable institutions to initiate research, which cannot find support elsewhere. Basic grants enable the institutions to maintain buildings, infrastructure etc. through periods of falling revenues from other sources. Nonetheless, the Danish allocation of basic grants has been criticized because it lacks direct incentives for efficiency, relevance and societal impact. In addition, there are no mechanisms assuring that the funding finds the way to the institutions where the highest quality is produced.

The second tier - external grants

The second tier of research funding, the external grants, has several intended effects. Competition is expected to raise accountability, efficiency and quality, and by earmarking some of the grants there is a possibility of directing research, not only towards certain areas, but also towards certain operational principles such as inter-disciplinarity, transdisciplinarity etc. However, it has also been emphasised that the Danish way of allocating external grants has several unintended effects. A weakness of the system has previously been that research funding had become far too complicated - with a jungle of special allocations and committees, resulting in bureaucracy. Researchers have had to deal with a complex and non-transparent system. In addition, the system was criticised for lacking overall management and coordination. A main aim of the most recent reform of the appropriations system was accordingly to attain a simplified and strengthened structure. Whether this objective has been achieved yet is early to conclude but nevertheless disputed in the debate (cf. Kalpazidou Schmidt 2006a & 2006b).

Other unintended effects have in particular been mentioned in relation to the earmarked funds. It has been claimed that strategic research programmes may harm basic research and that an unintended effect could be that the quality of research may be weakened, when funding systems prioritise politically defined areas. The increased time and resources spent on applications and reporting are also some unintended effects discussed as well as the feeling of a constant re-orientation towards shifting short term signals (cf. Floris, 1995: 6-7). Furthermore, when the content of research programmes increasingly gets formulated in political and administrative settings, research runs the risk of getting politicised and that the programmes do not match a qualitative research potential, because the funds are being allocated on the basis of political/administrative criteria rather than scientific quality (cf. Hansen, 1996: 23).

However, in a comprehensive evaluation of these questions, the opinions on the strategic research programmes as a whole among the stakeholders were positive. In general, no signs of damaging effects on basic research were found. Similarly, it was emphasised that no weakening of quality norms or short term change of direction could be observed. These conclusions were reached in 1995 and were only valid for a number of the large strategic programmes. Since then, no major evaluations have been carried out, but the discussion of the unintended effects has continued. In particular the usual small size of the programmes has been criticised. It is argued that competition, regarding narrow research programmes often is too limited in a small country like Denmark, resulting in lower research quality. This creates uncertainty with regard to the quality of the programmes within the research community and with regard to the legitimacy of the programmes (Aagaard, 2000).

Finally, it should also be mentioned as an unintended effect that external grants, due to low overheads and demands of co-financing, tend to tie the basic grants and thereby limit the strategic decision making of HEIs.

2.4 Influence of the Funding System on Institutional Strategies

In Denmark, there is no straightforward link between the funding system and the institutional strategies. The universities sign development-contracts with explicit institutional strategies with the Ministry of Science, Technology and Innovation. However, a university development contract is not a legally binding document. It is rather a letter of intent issued by the individual university stating the strategic areas that the university intends to focus on as well as the instruments the university intends to use in order to reach the set targets. Accordingly, there is no automatic relationship between reaching the set targets and the grants awarded. This may change soon as several stakeholders as well as the Government suggest that the development contracts in the future should be linked to the funding of basic grants (cf. Kalpazidou Schmidt 2006b).

Even though, there is no direct link between the funding system and institutional strategies, the funding system has indirect impacts on institutional strategies in several ways. Firstly, the earmarking of competition funds for research obliges the institutions to focus on prioritised areas, and secondly the taximeter system steers the institutions towards the preferences of the students. These tendencies are expected to become even more pronounced in the future as one of the main aims of the new University Act is to make the institutions act more strategically. This trend will most likely be further strengthened as several aspects of the funding of HEIs will be reformed in the near future.

2.5 Stakeholders' Views Concerning Strengths and Weaknesses of the Funding System

Based on a large amount of collected data including more than 2500 faculty members from all the Danish HEIs answering the on-line questionnaire, 50 survey-answers received from key stakeholders, a number of in depth interviews, official documents and various types of published material from a broad group of stakeholders, viewpoints concerning strengths and weaknesses of different aspects of the Danish funding system of HEIs have been identified. The survey was conducted during 2005 and 2006. A combination of quantitative and qualitative data has been used. In the following analysis the quantitative data are discussed as an entity since no clear patterns were found in the analysis of the responses of different stakeholder subgroups. Contrary to the quantitative data, it is possible to detect some differences of views between different stakeholders in the qualitative data.

Funding of education

Quantitative data: survey results

In general, the majority of the stakeholders are positive towards the taximeter principle as such. However, app. 1/4 of the respondents disagree strongly or partly with the statement that the taximeter system functions well. Likewise app. 1/3 of the respondents agree strongly or partly with the statement that the taximeter system should be replaced by another system.

Finally, app. 2/3 of the respondents agree strongly or partly with the statement that the system could be improved and should be supplemented with other mechanisms. With regards to the question of whether the existing system forces the institutions to lower the exam standards, to reduce the standards with regards to exams, 44% of the respondents disagree with this statement, while 35% agree.

Qualitative data

The patterns in the quantitative data are largely supported by the qualitative data. In general, the majority of stakeholders are positive towards the taximeter principle as such. It is accordingly emphasised by many that the system has clear advantages as it states direct demands to institutions on quantity and indirect demands on quality issues. Despite its shortcomings, several stakeholders mention that a better system yet has to be presented. However, the stakeholders also point to a number of problems in relation to the existing Danish system, and in general the impression is that there is room for substantial improvements. It is in particular emphasised that:

- there are no direct incentives to pursue quality and relevance. On the contrary, some state that the system has opposite effects;
- the element of competition is (too) limited, not least as a consequence of lacking information for students. This weakens the incentive mechanisms;
- the system tends to fail less popular courses, which however are important seen from a societal perspective. A bad year in terms of students has financial effects on institutions for years to come;
- there is limited degree of freedom and difficult conditions for change of research direction;
- there is dissatisfaction with the actual rates. The basic rates have been repeatedly cut during the last decade, and there is also, according to stakeholders, a lack of balance and clear rationale in the allocation of the rates between different educational fields. However, a share of the reductions in the rates has been returned to the universities in form of special funds.

A number of “external” stakeholders including the Confederation of Danish Industries and the Danish Innovation Council recommend that development funds for HE are allocated as a supplement to the taximeter system to encourage change and innovation. One suggestion is to link the allocation of these supplementary funds to the development contracts as well as to systematic evaluations.

Funding of research

The first tier - basic grants

Quantitative data: survey results

28% of the respondents disagree strongly or partly with the statement that the basic grant ought to make up a larger proportion of the total funding. At the same time, however, a large majority of the respondents (68%) agree strongly or partly with the statement that there ought to be a stronger linkage between scientific production and funding (only 10% disagree strongly or partly). Likewise 72% of the respondents agree strongly or partly with the statement that there ought to be a stronger linking between achieving university development contract objectives and funding.

Qualitative data

Even in this case the qualitative data support the quantitative. In general the stakeholders emphasise the importance of basic grants for the institutions. The arguments are:

- Basic grants secure a stable budget and enable long-term planning
- Basic grants are important for structural changes and the quality of basic research
- Basic grants allow flexibility in relation to changing conditions and adaptability to new research areas and innovations.

A number of stakeholders also point to problems with the existing allocation of basic grants. It is in particular emphasised that:

- The rationale in the allocation of basic grants in relation to quality, scientific production or achievement of contractual objectives is not straightforward
- Lacking use of performance parameters weakens existing incitement mechanisms and limits quality assurance
- Allocation of resources based on historical reasons makes it difficult for newer universities to build a stronger research environment and be competitive.

While the stakeholders agree on the above mentioned general viewpoints, there are some differences in opinions with regard to the optimal balance between internal and external funds. HEIs are not surprisingly more in favour of a large share of basic grants, than “external” stakeholders. The Danish Rectors Conference emphasise that the basic grants are the foundation of strategic actions and the fundament to their ability to offer a broad spectrum of education throughout the country. Furthermore, they argue that an apparent large share of basic grants is tied to co-financing of external projects, so that in reality the amount of free funds is more limited than supposed. This observation is supported among others by the Danish Advisory Council of Research Policy. However, there is a general openness among all stakeholders including the HEIs to the idea of linking the allocation of basic grants to performance parameters, even though many emphasise that the formulation of these parameters will be a very complex task.

External grants

Quantitative data: survey results

Half of the respondents agree strongly or partly with the statement that if the proportion of competition funds increases there is a risk of political steering of research while 28% disagree. Similarly, app. 2/3 of the respondents agree strongly or partly with the statement that an increased proportion of external funding leads to more short term employment and problems with long term planning of research and staffing.

Qualitative data

The views of the stakeholders concerning the competition funds as expressed in the qualitative data are more of a mixed bag, and do not completely support the scepticism noticed in the quantitative data. In general the importance of competition is stressed, but as the quantitative data indicate, the proportion of this measure and the terms and conditions related to it are highly debated. On the one side, the stakeholders in general point to a number of advantages in relation to the use of competition grants, namely that competition:

- raises quality, when grants are given to broad areas and in large shares. In particular, the model used by the Danish National Research Foundation seems to be popular with relatively large allocations, a long time horizon and a bottom up approach in the selection of research areas. The model has though been most fruitful in relation to certain scientific areas;
- involves higher attention to relevance and applicability;
- offers an alternative possibility of funding for research, which cannot be funded internally;
- strengthens collaboration.

On the other side, stakeholders point out the weaknesses in the use of competition grants:

- competition grants are often (too) narrow in scope and do not promote originality, creativity and novelty;
- not all scientific areas have the same possibilities of attracting such funding;
- applying for competition grants is resource demanding and time-consuming;
- an increasing proportion of competition grants limits the possibilities of long time planning for the HEIs;
- despite a recent reform of the system, quality assurance needs to be improved;
- there are major problems with the embedment of competition grants;
- competition grants often contribute only marginally to long-term institutional objectives;
- universities get forced to focus on areas where funding is available rather than on areas where they have high competence;
- strategic management of universities moves from the institutions to funding agencies;
- increased bureaucracy and administration;

- low overheads, which imply that institutions often cannot afford to attract external funds.

In general, there appears to be a strong consensus among the stakeholders regarding the advantages of larger and longer-term grants. Similarly, most stakeholders state that the low overhead rates seem to be an important barrier in the existing system. However, there are also important differences of opinions among the stakeholders. An issue is whether a strong emphasis on the ‘frontier research’ areas of ICT, biotechnology and nanotechnology should be pursued, or whether more country-specific priority fields which reflect Danish specialisations and strength positions should be prioritized. So far, the Danish Government seems to be in favour of the former strategy. One example of this tendency is the so-called High Technology Foundation mentioned above, which has a special focus on nanotechnology, biotechnology, ICT and the border-areas between these fields. The emphasis on the strategy of “picking the winners” by focusing on the same target-areas as most other countries has however been mentioned as a dangerous path to follow by various actors such as the OECD and the Danish Bankers Association. The critics argue that it is a risky strategy to target a few selected areas at the expense of broader growth potentials. No one can predict the growth of tomorrow, it is argued, and instead the efforts should be directed at creating optimal frame-conditions for research in general. Yet, an equivalent number of stakeholders argue that the small size of Denmark and the limited funds available necessitate a focusing on a number of selected areas.

2.6 Other Results

The future of the Danish funding system

Even though Danish HE already has seen a number of important changes in recent years, there are strong indications that further major changes targeting the funding system of HEIs will be implemented in the near future – a number of these changes will most likely be decided within 2006. As mentioned above the funding of the second tier of HE research has recently been changed through a major reform of the research funding system, and also the universities in general have been reformed with an aim to increase the universities’ autonomy and self-governance. The latter reform has not directly targeted the HE funding system, but the changes definitely have consequences for funding decisions as the act calls attention to the universities new appointed management to make strategic selections of research and education and give high priority to these areas (cf. Kalpazidou Schmidt, 2004).

In addition to these reforms a number of further systemic changes can be expected soon. The Danish Government has recently in connection with the work of the so-called Globalisation Council chaired by the Danish PM presented a number of objectives as regards the universities (Statsministeriet, 2006). The most important of these are listed below:

- basic funding will be distributed to universities according to the quality of research;

- from January 2008 basic funding of universities will be based on an evaluation of the institutions' ability to reach objectives given in a university development contract;
- the quality of university research will be evaluated by international, independent panels;
- university education will be evaluated and controlled by a new external accreditation institution. The Ministry will no longer provide criteria for university courses;
- universities will have more autonomy with regard to recruitment of researchers (e.g. salaries, the number of professors and the possibility of recruiting "super professors" within the frame of their own budget);
- universities will annually compete for large, long-term research projects;
- research councils will give priority to large investments in infrastructure, especially facilities that are used by several institutions;
- more public funding will be allotted to strategic research of importance for the development of society, e.g. in the areas of the environment, energy and health. Private co-funding will be encouraged;
- as much as 50 percent of public R&D funding will be competitive by 2010 (as opposed to 1/3 today). The funding will cover all costs, overhead included;
- public R&D investments will reach 1 percent of GDP within 2010. The private sector is expected to provide funds equivalent to 2 percent of GDP.

In particular the objective that a higher proportion of university funding in the future should be allocated based on performance parameters has attracted special attention. Firstly, the basic grants are supposed to be linked to the university development contracts, and secondly a significantly greater proportion of the research funding as a whole is supposed to be allocated through competition.

Furthermore, the Government intends to simplify the taximeter system substantially. It is worth noticing, that one of the most criticised aspects of the taximeter system – the difference in rates between different educational areas - has been given no attention in the otherwise comprehensive recent Globalisation Strategy.

In addition to these Government statements, a high profile Commission of Welfare has recently proposed changes towards greater tuition fees (for foreigners), and stronger incentives in the allocations from the State Educational Grant and Loan Scheme. These recommendations follow a recent change in legislation, which states that tuition is free for all EU/EEA students as well as for students participating in an exchange programme, but that all other students have to pay tuition fees from 2006 and onwards. Some observers see this as the first step towards a more widespread use of tuition fees.

On June 20th 2006 the Danish government presented its proposal on a new map of Danish universities as a result of a merging process initiated in late 2005. According to the plan, there should be only six universities – in contrast to the current twelve. At the same time, the government research institutes should merge with the upcoming new large universities.

The aim is to build larger HEIs that are more competitive when applying for EU grants and are able to attract more international researchers, as well as develop new education programmes and accomplish stronger links with industry.

As a consequence of the opposition that the proposal on mergers met among some universities, and the fact that no university can be forced into a merger without a change of the existing University Act, the outcome turned out to be somehow less comprehensive than intended. The new map of Danish universities that was presented on October 4th 2006 reveals that the twelve current universities will merge into nine – instead of six as it was the initial plan - with effect from January 2007 and that some government research institutes will remain independent.

The bottom line is that even though no precise model for a future funding system has been presented yet, major changes will very likely be implemented in the near future. The Government has invested a large amount of prestige and effort in the project of transforming Denmark into the most innovative and competitive nation of the world within the next decade. Most major stakeholders as well as the political opposition appear to have accepted the premises of these changes, so it is difficult to imagine that the announced changes will not be carried out in one form or another.

An important issue in Denmark has been the overall level of funding of HE. In particular the Barcelona objective of spending 3 pct. of GDP (1 percent coming from public funds) on research and development by 2010 has recently been the subject of intense discussion in Denmark. A number of key stakeholders have expressed strong dissatisfaction with the level as well as the rate of funding for the coming years. Among others the Confederation of Danish Industries and the Coordination Committee, which represents all key actors of the public Danish research system, have lately issued a strong critique of the progress towards the objective of the Barcelona declaration. However, the Government has on April 4, 2006 with its "Welfare Initiative" (Velfaerdsudspil) presented a funding plan which satisfied most of the critics. The Minister of Science, Technology and Innovation promised DKK 10.9 billion (1.5 billion EUR) to R&D for the period of 2007 to 2010 (cf. www.videnskabsministeriet.dk). However, in order to reach the 1 percent objective of public R&D spending, Denmark must be able to gain more out of the EU R&D funding. Furthermore, a major political task still lies ahead before the funding plan becomes a reality, as the negotiations of the funding have been linked to a number of far-reaching welfare reforms, where the funding apparently will be dependent on the outcome of the negotiations. The same goes for a large number of the additional initiatives in the Globalisation Strategy. Coming political negotiations will decide the exact outcome of these proposals.

3 Conclusions

The funding system of Danish HEIs is in a phase of transition. More or less all aspects related to funding have been reformed recently or will be reformed in the near future.

The existing Danish system with the taximeter system, the basic grants and the external grants as the three main sources of funding for the HEIs, has a number of strengths and weaknesses and a number of intended and unintended effects. The taximeter principle as such is by the majority of stakeholders perceived as reasonably well-functioning. It is emphasised by many that the system has clear advantages as it states direct demands on quantity and indirect demands on quality, and despite its shortcomings several stakeholders state that a better system yet has to be presented.

However, the stakeholders also point to a number of problems in relation to the existing Danish system, and in general the impression is that there is room for substantial improvements. It is in particular emphasised that there is a problem with the actual taximeter-rates. First of all, the basic rates have been repeatedly cut during the last decade, even though some of these resources have been re-allocated to the universities in other forms of revenues, and secondly the system has been criticised for lack of balance and clear rationale as regards the rates allocated between different educational areas.

With regards to the basic grants, there appears to be consensus about the importance of this aspect of the funding system. It is emphasised that the basic grants provide budget security and enable long-term planning. In addition, the basic grants are significant for structural changes and are the foundation for HEIs prospects to be flexible and adaptable to changing conditions. At last, these grants are important for the support of basic research and improvement of its quality. A number of stakeholders also point to problems with the existing allocation system of basic grants. It is in particular emphasised that the lack of use of performance parameters weakens incentive mechanisms and limits quality assurance. Another important unintended effect mentioned is the apparent large share of basic grants tied to co-financing of external projects. Accordingly, the factual amount of free funds at HEIs is not on the assumed level.

Finally, the analysis reveals a number of advantages and disadvantages in relation to the use of competition grants. It is acknowledged that competition raises quality, when grants are given to broad areas and in large shares, and that competition enhances applicability and collaboration. However, the stakeholders also stress a number of weaknesses in relation to the existing Danish allocation of competition grants. These grants target often areas that are too narrow in scope and do often not promote innovation, creativity and novelty. It is argued by many that an increased proportion of competition grants (as it is expected to be introduced in the near future) will limit the possibilities for long-term planning for the HEIs and force them to focus on areas where funding is available rather than on areas where the insti-

tutions have a high competence. A consequence might well be that strategic management of the universities will be moved from the institutions to the funding agencies and organisations.

Another key issue in relation to the allocation of external grants is whether a strong emphasis on the 'frontier research' areas of ICT, biotechnology and nanotechnology should be pursued, or more country-specific priority fields which reflect Danish specialisations and strength positions should be prioritized.

4 General Design and Study Goals

Main features of the funding system of HE are described based on background material analyses, statistics and document analyses. An overview of the Danish HE has been presented as follows:

- Formal, explicitly stated interrelationships between the funding system and national HE policies: Background material analyses.
- Intended and unintended effects of the funding system on HE and on the core tasks teaching and research: Background material analyses and stakeholders viewpoints.
- Influence of the funding system on institutional strategies: Background material analyses and stakeholders viewpoints.

Based on a large amount of collected data including (a) more than 2500 faculty member from the entire Danish HEIs system answering an on-line questionnaire, (b) 50 survey-answers received from key stakeholders, (c) in depth interviews with key stakeholders, (d) official documents and various types of published material from a broad group of stakeholders, viewpoints concerning strengths and weaknesses of different aspects of the Danish funding system of HEIs have been identified. The survey was conducted during 2005 and 2006.

4.1 Study Context

Danish Higher Education has seen a number of significant changes in recent years, which have influenced not only the funding system but also more or less all other aspects of HE. The most significant recent reforms are:

- Ongoing reform of the structure of the HEIs by merging universities and government research institutes (2006).
- Reform of the second tier of the research funding system (2003).
- Reform of the universities in order to further increase the universities' autonomy and self-governance, including introduction of a board with an external majority as the superior authority of a university, employed instead of elected leaders, and an explicit demand for interaction with society (2003).

Further changes of the funding system are expected in the near future. The Danish Government has recently announced that a higher proportion of university funding in the future will be allocated through competition, and that the allocation of basic grants will be linked to performance. Furthermore the Government intends to simplify the taximeter system and hence the funding of education substantially.

4.2 Key Areas

- National higher education funding policy
- Institutional responses to funding policies
- Stakeholders' opinions on effects of funding policies
- Faculty staff's opinions on effects of funding policies.

4.3 Key Questions

- What are the main features of the funding system of higher education?
- Are there formal explicitly stated interrelationships between the funding system and national higher education policies?
- What are intended and unintended effects of the funding system on higher education in general and on the basic core tasks teaching and research?
- Does the funding system influence on institutional strategies? If yes, how do institutions respond strategically to the funding system?
- What are the various stakeholders' points of view concerning strengths and weaknesses of the funding system?

4.4 Study Methods

Different methodological approaches and a combination of quantitative and qualitative data have been used, namely:

- Policy analysis (based on legislation, political statements etc.)
- Document analysis (based on available analysis' and stakeholder opinions published in the press or elsewhere)
- Statistical analysis
- In-depth interviews with key stakeholders
- A survey among university faculty members and stakeholders.

The **quantitative** data were gathered through a web-based questionnaire sent to a large number of key stakeholders. 50 responses covering a broad spectrum of stakeholders such as higher education managers, administrators, board members, funding organizations, business and labour organizations, student organizations, ministries etc. were received and analysed. In addition, more than 2500 faculty members from all the Danish HEIs have answered the on-line questionnaire. The **qualitative** data are based on a combination of comments to the questionnaire, personal interviews with key stakeholders and various published opinions of key stakeholders as well as viewpoints expressed in the press.

5 Bibliography

- Aagaard, Kaare (2000). Dansk Forskningspolitik – Organisation, virkemidler og indsatsområder, Rapport 2000/9. Analyseinstitut for Forskning.
- CPB; Netherlands Bureau for Economic Policy Analysis (2001). Higher Education Reform: Getting the Incentives Right. The Hague, The Netherlands.
- Danish Centre for Studies in Research and Research Policy (2006). Forskning og udviklingsarbejde i den offentlige sektor 2004.
- Finansministeriet (2005). Forslag til Finanslov 2006. København
- Finansministeriet (2006). Forslag til Finanslov 2007. København
- Floris, T. S. (1995). De strategiske forskningsprogrammer og deres afsmitning på grundforskningsmiljøerne; AKF Forlaget, København.
- Hansen, H. F. (1996). Forskningsforvaltning og forskningspolitik – en diskussion af udviklingstendenser relateret til struktur, proces og indhold, Samfundsøkonomen, nr.3-1996, p.18-29.
- Jongbloed, B. & H. Vossensteyn (2001). Keeping up performances: an international survey of performance-based funding in higher education. Journal of Higher Education Policy and Management, Vol. 23, No. 2, 2001.
- Kalpazidou Schmidt, E. (2006a). Higher Education in Scandinavia. International Handbook of Higher Education (Forest J. & Ph. Altbach, eds), pp. 517-538, Springer Verlag, January 2006.
- Kalpazidou Schmidt, E. (2006b). Management of Knowledge and Organizational Changes in Higher Education: The new Danish University Act. Paper presented at the Fifth International Conference on Knowledge, Culture and Change in Organisation. University of the Aegean, Rhodes, Greece, 19-22 July 2005. International Journal of Knowledge, Culture and Change Management, vol. 5, nr 3, 2006.
- Kalpazidou Schmidt, E. (2004). Higher Education and Research in the Nordic Countries – A Comparison of the Nordic Systems. The Danish Centre for Studies in Research and Research Policy, Report 2004/3.
- Ministeriet for Videnskab, Teknologi og Udvikling (2003). Lov om forskningsrådgivning m.v. 29. januar 2003. København.
- Ministeriet for Videnskab, Teknologi og Udvikling (2004). Forenkling af bevillingssystemet på Universitetsområdet; Taxameterudvalgets rapport. København K.
- Ministry of Research and information Technology (1998). Governing and Management of Universities in Denmark. Copenhagen.
- Ministry of Research and information Technology (1998). Funding of Higher Education. Copenhagen.
- Ministry of Science, Technology and Innovation (2003a). Act on Universities of May 28, 2003 (Translation) Explanatory notes. Copenhagen.
- Ministry of Science, Technology and Innovation (2003b). Danish universities - at the brink of transition. Background report to the OECD examiners panel. Copenhagen.
- Rektorkollegiet (2003). Universitetsuddannelser for Fremtiden. København.
- Statsministeriet (2006). Fremgang, Fornyelse og Tryghed. København
- Undervisningsministeriet (2000). Takstefter syn: Hovedrapport og bilagsrapport. København
- Undervisningsministeriet (2001). Taxametersystemet for de videregående uddannelser; Rapport fra Undervisningsministerens Idé- og Perspektivgruppe.
- Undervisningsministeriet (2005). Styringsanalysen – analyse af uddannelsesområdets styringssystem. København.