Ben JONGBLOED[1] (Twente)

Performance-oriented Budgeting in Europe: Trends, Effects and Consequences

Abstract

Starting with a classification of funding mechanisms, this article surveys the funding methodologies for eleven European higher education systems and points at the growing popularity of performance-based approaches in funding. For a set of European universities information is presented on the development of the universities' internal resource allocation models. Partly as a result of the increased performance-orientation, the individual universities' resource allocation mechanisms and their revenue structures were affected over the years. Universities have implemented policies to encourage income generation and research concentration to build competitive strengths. Thus, developments in the national funding environment are mirrored by developments inside the universities – although performance based funding remains a contentious issue.

Keywords

Funding, universities, performance-based funding, new public management, marketisation

Leistungsorientierte Budgetierung in Europa: Trends, Wirkungen und Konsequenzen

Zusammenfassung

Beginnend mit einer Klassifizierung von Finanzierungsmechanismen werden die Finanzierungsmethoden in elf europäischen Hochschulsystemen untersucht, wobei die wachsende Beliebtheit von leistungsorientierten Ansätzen herausticht. Für eine Reihe europäischer Universitäten wird die Entwicklung der internen Mittelvergabemodelle dargestellt. U.a. durch die zunehmende Leistungsorientierung haben sich die Mechanismen der Mittelvergabe und die Einkommensstrukturen im Lauf der Jahre verändert. Universitäten entwickeln Richtlinien, welche die Einwerbung von Mitteln und die Konzentration von Forschungsleistungen fördern, um die Wettbewerbsfähigkeit zu steigern. Somit werden die Entwicklungen auf der staatlichen Ebene durch inneruniversitäre Entwicklungen gespiegelt – obwohl leistungsorientierte Mittelvergabe nach wie vor ein umstrittenes Thema bleibt.

Schlüsselwörter

Finanzierung, Universitäten, leistungsorientierte Mittelvergabe, New Public Management, Marktorientierung

[1] e-Mail: B.W.A.Jongbloed@utwente.nl

1 Introduction

This article is about funding mechanisms for European universities. The central question is: do the funding authorities that decide on the universities' teaching and research grants base the size of the grant on measures of institutional performance? We will take a look at the higher education funding mechanisms used in a number of European countries and describe to what extent the public authorities employ performance-based funding (PBF) approaches or inject more of a performance orientation in the budget decisions they make. Surely, one would expect this to be the case, given the fact that efficiency and value for money are key objectives for holders of budgets. The question is, how do they do that? What performance measures do they employ? Yet another question is: what effect does this have on the higher education system? While the latter question is difficult to answer, we will present some results from an international study carried out in eleven European higher education systems.

The structure of this article is as follows.

In section 2 we will present a classification of funding methodologies through which the state allocates subsidies to individual higher education institutions. Performance-based approaches may be fitted into this classification scheme. One of the challenges that universities face these days is the change in funding mechanisms as used by public authorities. Some of these challenges are discussed in section 3, where we sketch the policy environment for universities.

Section 4 includes an overview of funding mechanisms for a number of European higher education systems. Much of the empirical material presented here (and in other sections) is derived from an international comparative study in which this author participated (SLIPERSAETER et al., 2006).

In section 5 we will show that, like the national government, individual universities are adjusting their internal resource allocation mechanisms. The universities' strategies in dealing with changes in their (funding) environment are set out here. Finally, section 6 is summing up some of the main conclusions that may be drawn from our review of the developments in performance-based funding and provides some critical reflections.

2 A classification of funding mechanisms

We now turn to public funding of higher education providers and the mechanisms (the 'funding models') that are used for determining the budgets that are distributed by the public authorities to the universities and colleges in the higher education system. Right from the start, we stress that funding higher education is not an end in itself. Rather, it is a means to an end; it is an instrument used by public authorities to affect the behaviour of an agent – say a 'spending unit'. The budget holder is expecting the spending unit to work on achieving particular outcomes. As a steering instrument, the funding mechanism is part of the government's toolkit. This toolkit contains four 'tools' (JONGBLOED, 2004):

1. regulation (rules, laws);
2. funding (subsidies, grants, taxes);
3. public production (provision of goods by government-owned providers);
4. communication (information, persuasion).

Funding is one of the key intervention instruments – for government (ministries, funding councils) as well as university decision-makers (Executive Boards, deans, department heads). Funding modes and funding models not only serve to allocate resources for given ends, they are increasingly being used as governance or management tools in situations where institutions operate in an environment characterized by an absence of competitive elements. As we will see in section 3, changes in funding mechanisms constitute a central package of measures related to public management reforms. At this point we stress that changes in funding mechanisms will often go hand in hand with changes in the other steering instruments. However, for this paper we limit ourselves to the instrument of funding.

For the classification of funding mechanisms two questions may be used (JONGBLOED & KOELMAN, 2000):

1. What is funded by the government?
2. How is it funded?

The first question concerns the funding base for the government allocations to higher education institutions: Are the funds tied to educational outputs and performance, or rather to inputs? The second question relates to the issue of the degree of market orientation in the funding arrangements. Whose decisions actually underlie the observed flow of government funds to higher education institutions, or: "what drives the system?' The answer may be found by paying attention to issues such as: to what extent are funded numbers or funded (research and degree) programs regulated (or planned) by central authorities? And: do higher education institutions compete for funds (i.e. students, research programs)? Do they have the right to determine the level of tuition fees by themselves? Can they select their students?

Question no. 1 can be rephrased as follows: What is the degree of output orientation in the public funding? When financial means are made available to institutions to cover distinct costs such as staff salaries, material means, building maintenance costs, investment, or so-called "costs to continue", this is called input funding. If the budgets are driven by measures of activity such as the number of students enrolled in an institution, we also speak of input funding, because student numbers will largely determine the level of inputs spent in the instruction process. In contrast, in funding arrangements where institutional budgets are tied to specific teaching and research outcomes of the institutions' activities we speak of output funding. Funding on the basis of output is believed to contain more incentives for efficient behaviour than input funding. If budgets depend on performance measures, there is reason to believe that those who receive the budgets will pay increased attention to their performance.

Question no. 2 relates to the issue of market orientation in the funding arrangements. One of the characteristics of market orientation is the degree of competition implied by the funding decisions. Stated differently: "Are funded student numbers or funded (research, degree) programs regulated (or planned) by central authorities or are the funding flows driven by the decisions of the clients (students, private firms, research councils/foundations)?" The answer to this question may be translated into a measure for the degree of centralisation, distinguishing a situation of intensive government oversight and regulation from a situation in which consumer and producer sovereignty is large. At the extreme end of regulation the government determines the institutions' resources centrally, for instance by prescribing the exact numbers of students in different programs. In the deregulated case, individual decisions made by students and education providers drive the system. Here, institutions have considerable latitude to operate as they see fit and institutions have a large autonomy over how funding is procured and spent. In practical situations, the degree of centralisation (or market orientation) will lie somewhere between the two extremes.

In figure 1 below, the vertical axis depicts the degree of (de-) centralisation and a horizontal axis expresses the degree to which governments are paying for the results (outcomes) instead of the efforts (inputs). We distinguish four quadrants (Q1, Q2, Q3, and Q4) to classify funding arrangements.

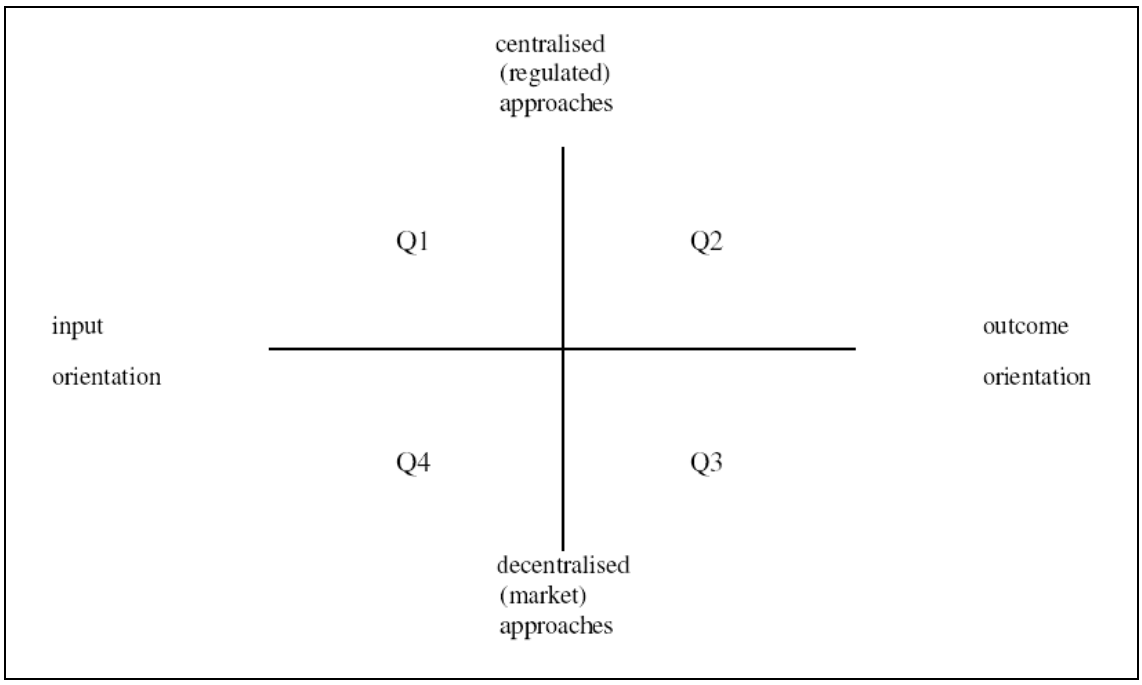


Figure 1: Classifying funding mechanisms

We now provide a number of examples that relate to the four types of funding mechanisms.

Q1: planned, input-based funding through providers

The top-left-hand portion of the diagram represents a centralised system of funding. It shows a more traditional type of budgeting, where allocations are based on requests (activity plans, budget proposals) submitted to budgetary authorities. This is known as *negotiated funding*. In this mechanism, the budget allocation is often based on the previous year's allocation of specific budget items. Separate budget items are then negotiated between representatives of educational institutions and the funding authorities (i.e., the ministry, or funding council). Annual changes (usually increases) in each budget item are treated individually, with discussion taking place on the basis of cost projections. In this case, budget items are likely to include categories such as staff salaries, material requirements, building maintenance costs, and investment. Funding is *line item* based, and shows the different expenditure items as separate lines of the budget. These line items are determined by referring to norms with respect to indicators such as unit costs (or unit cost rises) or capacity (e.g., funded number of students). The German and French funding systems still retain much of these characteristics.

Q2: performance-based funding of providers

Quadrant two (top right) is still a centralised system but now criteria on which funding is allocated refer to *outputs* rather than inputs. For example, in such a performance-based funding system a formula generates funds for institutions that are successful in terms of their students passing exams. Depending on the number of credits (i.e., weighted number of passed courses) accumulated by their students and the subject categories concerned, a budget is flowing to the higher education institution. This type of model operates in Denmark (*taximeter* model), while in Sweden a mix of enrolment numbers and credits determines the funds allocated to higher education institutions. In the Netherlands, a mix of the number of first-year students ('freshmen') and the number of Master's degrees conferred determines the funds allocated to the universities (see JONGBLOED & VOSSENSTEYN 2001). Other examples can be found in the UK, where academic research is funded in proportion to a measure of research quality. Research quality is assessed and rated every five years (in Research Assessment Exercises).

Q3: purpose-specific purchasing from providers

A funding system located in quadrant 3 (lower right) is a market-oriented system. For example, higher education institutions are invited to submit tenders for a given supply of graduates or research activities. The tenders selected by the funding agency are the most price-competitive. In this tendering process, higher education institutions are encouraged to compete with one another to provide education, training, and research to meet national needs. Another example is research funds awarded by research councils. This system makes use of contracts signed between the funding agency and higher education institutions, with the latter agreeing to deliver graduates for targeted labour market needs, or research outputs targeted at strengthening the innovative capacity of the country. When entering into a contract,

the funding agency will make sure it obtains the services it wants for a reasonable price. In this way the cost-effectiveness of the delivery is stressed. In the contract, both parties express that they will obey certain criteria. Only if these criteria are fulfilled, will the higher education institution receive core funding. The criteria may concern the types and qualifications of students admitted to the higher education institution, the (maximum) level of tuition fees (if any) charged by the institution, and the commitment made by the higher education institution towards its students in the instruction and teaching processes.

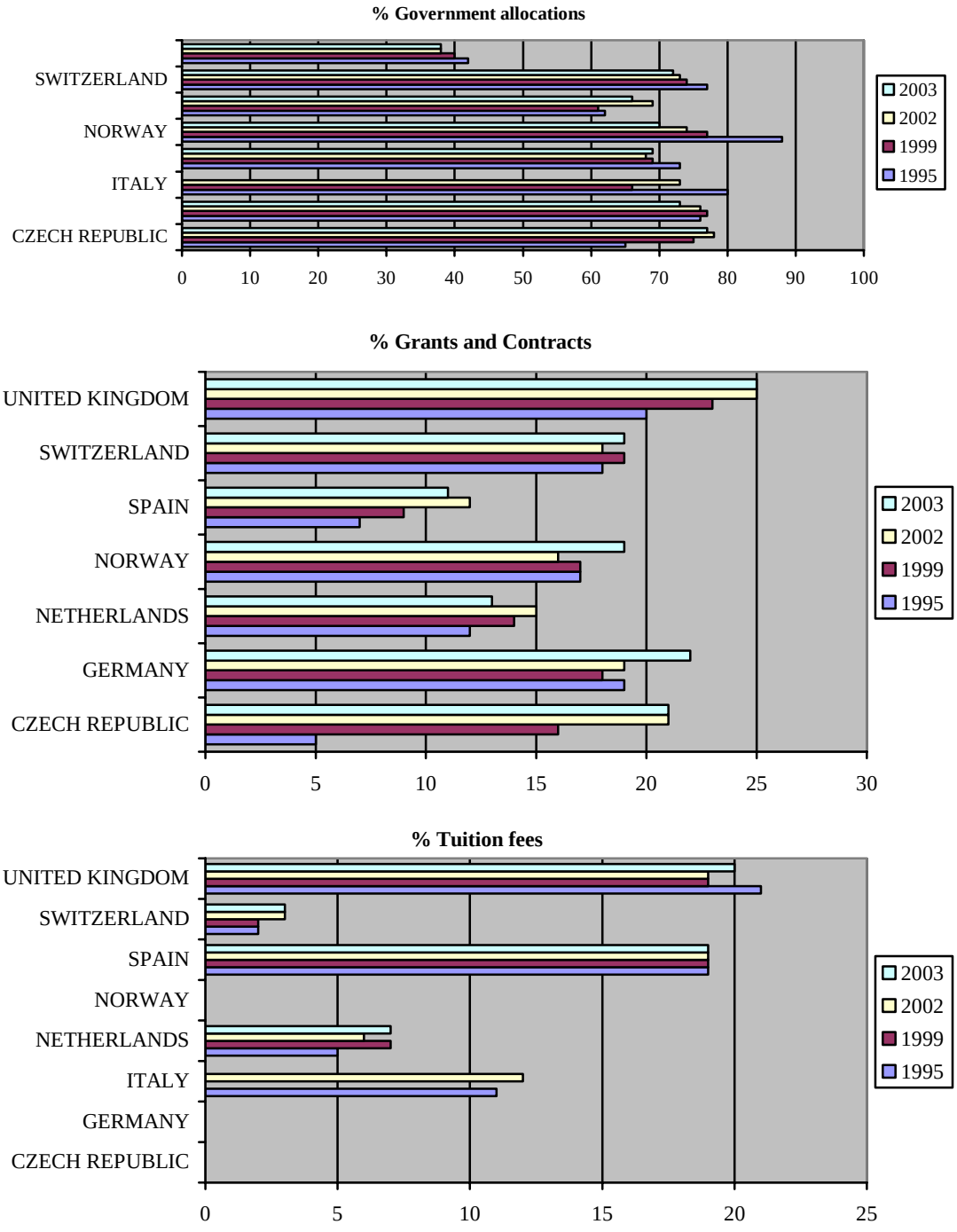
Q4: demand-driven, input-based funding through clients

In the last quadrant (lower left) the funding system makes use of vouchers. The core funds of higher education institutions are supplied through the clients of higher education institutions. Students obtain vouchers, which can be traded for educational services (i.e., educational consumption), at the higher education institution of their own choice. For the higher education institution the vouchers represent a certain value; they can be cashed at the Ministry of Education. Each (prospective) student is given a limited number of vouchers, representing a value, which can be used in a flexible way (during a certain period of time and for programs supplied by a given number of accredited or recognised education providers). In this funding system it is the consumer that drives the system; the system is demand-driven. The client (student) decides what institution to attend and what programs to enrol in. The higher education institutions must look after the quality of their teaching and their supply of courses, because unattractive programs will not receive sufficient funding. The voucher system can be combined – like many other funding variants – with a system of differentiated course fees. The higher education institutions then charge the students a certain percentage of the course costs. Tuition fees may be regulated to some extent by the government, but flexible pricing is expected to make students pay attention to the quality of the service they get from the higher education institution. Combining vouchers and fees may result in a system that is responsive to individual students' demands. A research funding model situated in diagram Q4 would be similar to the research council example given for quadrant three, but in this case there would be more attention paid to basic research instead of research for which the outcomes are easier to specify.

3 Changes in the funding environment: Performance-based funding

The aim of this section is to sketch the changes in the universities' funding environment - in particular the trend towards performance-based funding (PBF).

The set of graphs in figure 2 below illustrate the developments over the period 1995-2003 in the funding situation for a sample of 89 European higher education institutions from 8 countries. The sample was studied in the context of the project CHINC (Changes in University Incomes and their Impact on university-based research and innovation).



Note: National aggregates are based on the CHINC sample. Government allocations for Spain are overestimated since they contain also grants and contracts. For Italy no data on grants & contracts are available. Source: CHINC project (LEPORI et al., 2005)

Figure 2: Evolution of main revenue categories by country 1995, 1999, 2002 and 2003

This project was unique in the sense that funding data was collected directly from a set of research-intensive universities and universities of applied sciences (SLIPER-SAETER et al., 2006; SALERNO et al., 2005). Building on the institutional-level

data, some funding trends on the national level become visible. We focus on three revenue categories: government appropriations (say: core funding), tuition fees (student funding) and grants & contracts (competetive funding; project funding).

1. Government appropriations are still the dominant source of revenues in all countries except the UK. The share exceeds two-thirds in all countries, except for the UK, that in 2002/03 displays a share of 37%.
2. Tuition fees are an important source of revenues in only three countries, i.e. Italy, Spain and the UK, while in the other countries fees account for a relatively small share of revenues.
3. The aggregate share of grants & contracts shows some variation between countries – the lowest value being 10% in Spain, the highest 25% in the UK –, but most of the countries considered here are in the range between 19 and 25%.
4. Over the period 1995-2003 we note a slight decrease in the share of government appropriations, no change at all in the share of tuition fees, and a general increase in the share of competitive grants & contracts.

Of course, these data must be considered with care, since the CHINC database covers only a sub-sample of institutions, which in large countries – Germany, Italy, Spain, UK – is far from being representative.

Apart from the composition and level of the funding streams, changes may be observed in the criteria that drive the allocation of the government appropriations to the institutions. In the sector of higher education, governance and management traditionally has resorted to a system where the funding of the providers of higher education and research takes place mainly by indirect, formula-driven directives that are tied to inputs like student enrolments or staff positions. In recent years, we have witnessed the implementation of governance reforms that fall in the repertoire of New Public Management (NPM) (POLLITT & BOUCKAERT, 2000). NPM seeks to emulate a market-like environment for publicly-funded institutions through the introduction of competition, user fees, and the stressing of performance reporting. With respect to the funding criteria, we see more attention paid to output and outcomes. Many governments, in order to create an environment of quasi-markets (TEIXEIRA *et al.*, 2004), have implemented performance-based funding (PBF) modes (JONGBLOED & VOSSENSTEYN, 2001). PBF aims to give more money to activities that produce wanted results and less to those that do not. Rewarding performance through PBF changes the focus from inputs to outputs.

In terms of figure 1, we observe a change from funding approaches that fall in quadrant 1 (input – centralised) to approaches that lie in quadrants 2 (output – centralised) and 3 (output – decentralised). The universities' appropriations (their core funding) are increasingly based on measures of institutional performance, using two options (or a combination of the two):

1. budgets are based on actual results,
2. budgets are based on projected results.

An example of option 1 is where funding takes place according to a formula that is driven by the number of degrees or credits accumulated by students. An example that falls under the second option is the allocation of grants and contracts in a competitive process, such as through a research council.

While PBF-approaches have their appeal, they do require governments to be informed about the services that universities will provide and the expected benefits and social conditions that will derive from spending public funds. Two things are complicating such insights. First, the performance information is not accurate or maybe even absent altogether. In particular when it comes to issues such as the volume and composition of the services provided by universities, performance indicators cannot capture the qualitative dimension of the outputs. Second, there is still a great deal of ignorance about the production process in higher education. We are faced with a general lack of understanding about the way in which universities use their many inputs to produce research and education. Efforts to empirically estimate higher education production functions have met with little success. Some have even questioned whether anyone will ever be able to formulate a higher education production function with any real degree of precision (HOPKINS, 1990).

To put it shortly, PBF may be easy to explain, but it is hard to implement in practice without making compromises of some sort. In reality, PBF comes in as many varieties as there are governments that have applied it (SCHICK, 2007). Each government has its own approach about how to feed performance data into the budget decisions. The many approaches can be aligned along a spectrum ranging from the loosest concept, where performance data is only one of the items that co-determines the size of the budget, to the most stringent approaches, which formally link increments in budgets to increments in performance. In any case, both approaches to PBF depend crucially on performance information and performance measurement. Many governments have invested heavily in measuring performance, not just for the sake of informing budget decisions, but also in a general strive to enhance accountability frameworks and to assist the general public (students, other stakeholders) in making well-informed decisions.

Surveying the funding mechanisms in place across OECD states, governments in a number of countries have attempted to separate their support for teaching and research by providing block (i.e. lump sum) funding for each activity – covering the day-to-day running costs. There has also been a tendency to augment block funding for research with competitive funding mechanisms (Q3), or performance-based funding mechanisms (Q2). The extent to which such moves towards a dual funding system have taken place naturally varies across countries.

The next section contains a short expose on the funding approaches for a number of European higher education systems. We are primarily interested in the emergence of PBF and the reliance on project funding through research councils and similar competitive mechanisms that reward performance.

4 Overview of funding methodologies for eleven countries

In this section we characterize systematically the national funding systems for higher education in the countries covered in the CHINC project (mentioned above). We discuss the following structural features:

1. The organization of the public research system (PSR) and the role of higher education against that of public research laboratories; a simple typology distinguishes between systems dominated by higher education, mixed systems where the two sectors are clearly separated and mixed joint systems where a part of research is performed in joint laboratories (OECD 2003; SENKER et al. 1999).
2. The prevalent allocation mechanism for government appropriations distinguishing between "un-conditional" allocation mechanisms (based on historical keys and/or on case by case negotiation) and "conditional" allocation mechanisms, where allocation is calculated on the basis of formulas (KAISER et al. 2001).
3. The importance of competitive grants mechanisms and, in particular, the presence of a research council funding academic research.

The following table 1 presents an overview of the systems and some comments. It is important to recall that the table refers to the national level, while the situation for individual institutions might be to some extent different.

Table 1: Comparative analysis of higher education funding systems

	PSR*	***HE system***	***Funding level***	***Government funding***	***Fees***
Czech Republic	36%	Binary	National	input (student)	No
France	52%	Unitary	National	Input (student)	Set
Italy	62%	Unitary	National	Input, output	Free
Netherlands	68%	Binary	National	Formula: input, output	Set
Norway	64%	Binary	National	Formula: input, output	No
Spain	65%	Unitary	Regional	Global budget and output	Free
UK	63%	Unitary	National	Formula	Free
Switzerland	95%	Binary	Regional/ national	Historical, input, output	Set
Denmark	73%	Binary	National	Contract	No
Germany	54%	Binary	Regional	Historical, input-output, contract	No
Hungary	48%	Binary	National	Historical	Set

* % of public-sector R&D expenditures in the HE sector; source: OECD MSTI database

Fees: set = the level is defined by the stat; free = universities are free to set the level, up to a fixed threshold.

From this table, we notice some important distinctions.

Firstly, the higher education sector is in all countries except the Czech Republic the major performer in public research, but with quite important differences: in the Czech Republic public laboratories are dominant, while six countries have a mixed system with a large public laboratories sector (Hungary, Germany, Italy, Norway, Spain and the UK); France is a very special case since the two sectors are closely connected through the joint laboratories between CNRS and universities. In the three remaining countries – Denmark, Netherlands and Switzerland – universities are more important than public sector laboratories, with the extreme case of Switzerland where this sector is very limited.

Three countries – Germany, Spain and Switzerland – posses also a system where general funding comes to a large extent from the regions; in these cases we encounter a much larger diversity in funding mechanisms and levels than in unitary countries.

Further, in most countries allocation of government appropriations occurs through a mix between historically based criteria and the use of input and – to a lesser extent – output criteria. Formula-based mechanisms are prevalent in Denmark and UK, while in countries like Hungary, Germany and Switzerland historical criteria still play a central role. The main input criterion for the teaching budget is clearly student numbers (France, Italy, Spain, UK).

When it comes to tendencies that point in the direction of Performance-based funding, we observe the following:

- For the Danish system, the teaching allocation, which on average makes up one third of the revenues of universities, is directly linked to the number of students who pass their exams.
- In the Dutch funding system, the universities' teaching allocation is 50% based on numbers of degrees, and for its universities of applied sciences, graduation rates affect funding. In the research budget, performance elements such as Master's diplomas and PhD degrees are partly driving the funds per institution.
- While the funding of teaching activities in the Czech Republic is mostly input oriented (number of students, etc), output criteria such as the number of graduates have recently been introduced.
- In the German states funding is a mixture of historical, input and output-oriented allocation mechanisms (GÖBBELS-DREYLING, 2003; LESZCZENSKY & ORR, 2004).
- Based historically on an input system (number of students), the Italian funding system nowadays is also partially based on output criteria related to research performance (through the introduction of a Research evaluation exercise).
- The Norwegian funding system allocates funds according to a formula based on a combination of a fixed component (60%) and components driven by results in education (25% – based on students' credits and graduates) and research (15% – based on the number of publications).
- The universities in the UK receive a research budget that is based on quality evaluations established in periodic *research assessment exercises* (RAE).

Turning to the third quadrant (Q3) in figure 1, we note that all countries use instruments to allocate project funds to universities, even if the project funds differ in importance across the countries (see LEPORI, 2005a). Apart from France, Italy and Spain, all countries possess a research council that awards competitive grants to academic research projects in universities. In Italy and Spain these funds are channelled directly through the ministry (POTÌ & REALE, 2005; SANZ et al., 2005), while in France project funding until today seems to have played a more limited role.

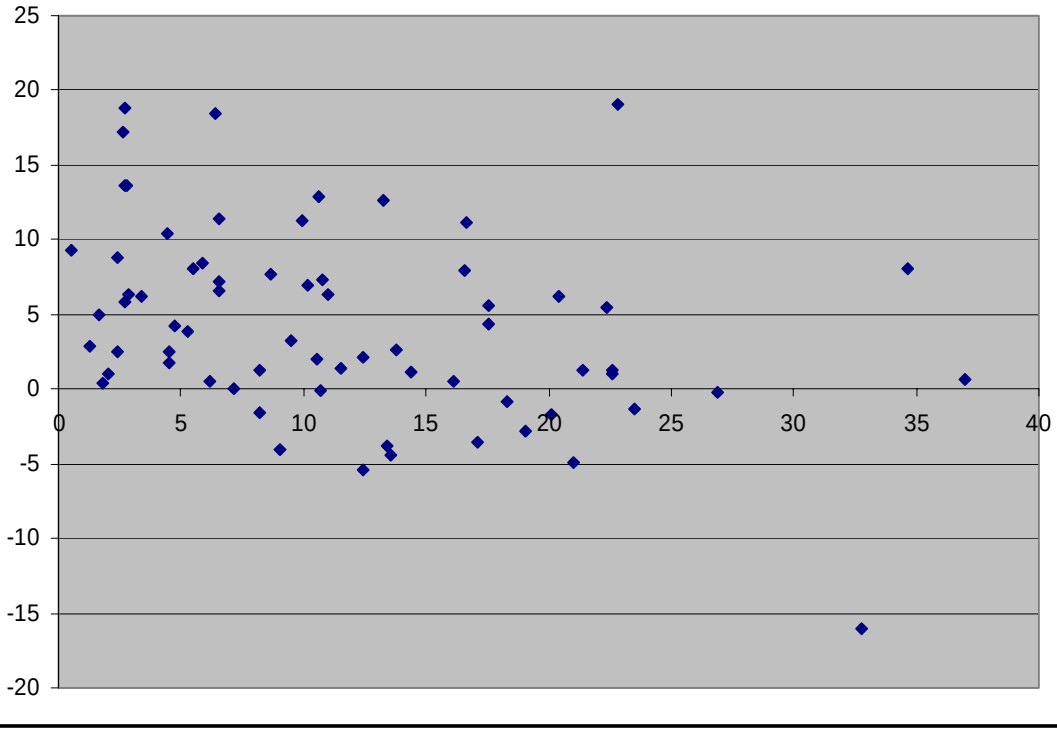
Located in the same quadrant, another trend that we observe is the use of contracts signed between public authorities and institutions. This is also a way of the government `buying' a particular performance from the university.

- Czech Republic: Part of the university's budget is distributed by contracts according to state plans and programs.
- Denmark: Since 1999 university development contracts have been established as an instrument in describing the tasks of the institution as defined by each university in consultation with the Ministry of Science.
- France: The university budget derives from a four year contract between the Ministry of Education and the governing board of the university.
- Switzerland: Most cantonal governments have introduced a contract with their university, even if the level is mostly based on historical considerations and some input criteria.
- Germany: Most states (*Länder*) use contracts (*Zielvereinbahrungen*) similar to the Danish case to allocate certain parts of the budget.

Overlooking the funding mechanisms for the eleven higher education systems, we observe a large variety. While we observe a growing use of performance measures, there is as yet no uniformity in the choice of indicators. Our overview shows that use is made of the following performance indicators: number of (BA and MA) degrees, credits, graduation rates, success in winning competitive research grants, academic publications, and research evaluation outcomes. Little consensus seems to exist on the way to weigh the different measures. Maybe as a consequence of this, as well as to allow for some flexibility, we see an increased prominence of contracts and the allocation of project funds to encourage universities to work on particular types of performance.

5 Impacts on individual institutions

Partly as a result of the changes in the universities' funding environment and the stressing of performance, one should expect the composition of individual universities' revenue structure to have changed fundamentally over recent years. Where in the previous section we already showed some national averages for a number of countries, we now turn to the level of the individual institutions.



Legend: X axis: Share (%) of grants & contracts in total revenues for the year 1995
Y axis: Change in share of grants & contracts over period 1995-2003

Figure 3: Changes in the % of grants and contracts

The drive towards more performance-based funds puts pressure on the universities to compete for grants and contracts. Figure 3 shows that over the period 1995-2003 there has been an increase in the share of grants & contracts for the 68 institutions in the CHINC sample that were able to deliver data on this funding source. The increase in competitive revenues, shown on the vertical axis, is particularly large for the institutions that at the start of this period had only a small share of their income coming from grants & contracts. In other words, there is at the same time, some evidence of a levelling off of the level of grants and contracts over the period considered.

Partly as a result of the increased performance-orientation in the universities' funding environment, one would expect the individual universities' internal resource allocation mechanisms to have changed accordingly. To investigate this hypothesis, the CHINC study mentioned above made a detailed study of the approaches used by individual universities for the internal allocation of resources across the different departments and units within the institution (Salerno et al., 2005). The 95 universities in the CHINC sample were invited to characterize their internal resource allocation model, choosing between seven options (see table 2).

For deciding on the budgets going to their faculties, most institutions (roughly two thirds) reported using formula-based approaches. The formula is driven either by input measures (e.g. staff positions, student enrolments, space), output measures (such as degrees, publications, citations, grants won, an assessment/rating of depart-

mental research quality), or a mix of the two. The more traditional way of negotiating about faculty budgets (13% of the cases) and historical arguments (3% – only in Switzerland), however, is still present. A contract-based approach (a more formal performance-oriented contract between sub-units and central level) is employed in the three countries where it is also in use for the national level.

Table 2: Characteristics of internal allocation models

	Formula-funding			**Negotiations**	**Historical**	**Contract**	**Other**	
	Input-oriented	Performance-oriented	Mix of input & output					N
Czech Rep		1	5					6
Denmark			2			5	1	8
France	2	3	2	1			1	9
Germany	1		4	2		2	1	10
Hungary	2	1		1				4
Italy	1	1	4			1		7
NetherInds	2	3	3					8
Norway	1	1	6					8
Spain	3	2	3	1				9
SwitzerInd				5	3	7		15
UK	4		4	2			1	11
Total	**15**	**12**	**33**	**12**	**3**	**15**	**4**	**95**
(%)	(17)	(13)	(35)	(13)	(3)	(16)	(4)	(100)

Table 3 (again from SALERNO et al., 2005) illustrates that, in an environment that stresses market-type mechanisms such competition and rewards, universities are introducing incentives to encourage their faculties to generate external (i.e. competitive, third party, industry-based) income. This is particularly relevant in a situation where unconditional government funding is on its way down. Introducing a performance-oriented resource allocation model often will be complementary to income-generation strategies. Apart from some unique approaches (the 'other category' in table 3), four types of institutional policies were explicitly mentioned in the CHINC study:

1. Providing premiums or matching funds for departments that are successful in bringing in external funding/competitive research contracts.
2. Allowing departments that generate research income to keep a substantial part of the earnings.
3. Introducing a form of performance-based funding that rewards units/ faculties/departments on the basis of research outputs.
4. Giving greater visibility to institutes/individuals' performance.

Table 3: Institutions' policies to encourage income generation

Country (sample size)	Premiums for income generation	Allow units to keep their earned income	PBF (rewarding research performance)	Highlighting researchers' performance	Other policies mentioned
Czech Rep (6)	2	4	4	3	
Denmark (9)	2	6	1	2	Wage bonus or research time
France (9)	0	9	2	5	'bonus qualité recherche'
Germany (9)	8	8	7	8	
Hungary (5)	0	3	1		
Italy (7)	4	4	3	5	Individual rewards to research staff
Netherlands (8)	6	6	4	1	Awarding performance or research prize
Norway (8)	5	4	3	2	
Spain (10)	1	8	3	4	
Switzerland (15)	10	10	7	6	
UK (11)	3	9	5	3	
Total (97)	**41**	**71**	**40**	**39**	
(percentage)	(42%)	(73%)	(41%)	(40%)	

The research strategies adopted by the respondents in the CHINC study may be characterised as manifestations of universities behaving as 'strategic actors' (BONACCORSI et al., 2007). Many universities are creating "centres of excellence"; they are trying to build critical mass and are selective in the disciplinary areas they wish to cover in teaching and research. In other words, universities are trying to more clearly position themselves in the European landscape by working on a clear profile. Institutional leaders strengthen the performance-related part in their university's allocation model believing it will lead to a concentration of resources in larger and more visible units that stand a better chance in a competitive environment.

It remains to be seen whether resource concentration – or indeed performance-based funding – leads to improved performance on the part of the individual institution and – summing up all institutions – the country as a whole. The evidence is still ambiguous. Citing a study carried out in the UK (EVIDENCE LTD., 2003) that looked at the relationship between the size of a research unit and its relative research performance: "there is no strong evidence in any but a small number of cases that there is a linear relationship that links progressive improvements in performance with unit size over any wide scale" (p. 62). In the UK, critical mass seems to be a factor, but it is not a universal one and is unlikely to be causative.

6 Conclusion and reflections

This article looked at the increasing popularity of performance-based funding (PBF). In section 2, we have characterized PBF by placing it in a classification of funding mechanisms. An overview of funding mechanisms was presented in section 4 for a number of European countries. We have also shown some data on the changes in the European universities' funding environment (section 3). In section 5, we analyzed the changes in the resources on the level of the individual university. What has come out clearly is that developments in the national funding environment are mirrored by developments inside the universities. In this final section we now will reflect shortly on PBF.

PBF is often born out of the idea that academics are not sufficiently driven by performance stimuli or are delivering the types of performance that the budget holder believe are less desirable. Thus, PBF is implemented, first of all, to encourage efficiency, but, secondly, it is also trying to push organisations to produce relevant outputs. On the first note, while not everybody will agree with the idea that academics have too few incentives for efficiency, it is a fact that all organisations can do better. However, one needs to realise that the existence of a certain amount of slack is a phenomenon that is present even in a competitive system. The again, this does not relieve also the academic sector from trying to operate efficiently. Because New Public Management practices have been implemented elsewhere in the public sector, the sector of higher education surely cannot escape this trend. PBF can increase efficiency in the short term and provide greater accountability.

On the second note – the encouragement of relevant outputs – PBF makes explicit what outputs and types of performance qualify for public funding. PBF can shift priorities and provides budget holders with 'policy levers'. It can move resources from less well-performing areas to areas where they can be used to greater effect. However, the choice of performance will always be driven partly by political criteria and here budget holders need to realize that the outputs they prefer are the outcome of a production process that needs maintenance. To use the metaphor of a chicken farm: while budget holders may like to see as many eggs sold as possible they should also be prepared to look after the hens. This brings us to a first recommendation: the choice of performance indicators will have to be the outcome of an interactive design process involving both the budget authority and the receiver of the budget.

Continuing our critical reflection on PBF we now mention three additional risks attached to implementing PBF.

First, PBF requires information on performance. However, obtaining reliable and comparable performance information is costly. Quality indicators, for example, require considerably more effort to obtain the necessary information. This is particularly evident in the case of peer review, where teams of experts evaluate the quality and productivity of a research unit in comparison to similar units. From our overviews of the funding models in section 4 it has become clear that performance measures are mostly based on ad hoc, piecemeal inclusion of intuitively appealing indicators rather than serious analyses of the institution's internal production

dynamics. As such they seriously neglect the fact that universities use multiple inputs to produce multiple outputs.

Secondly, PBF may encourage a shift to the homogenization of the academic landscape. It may discourage experiments and primarily reward activities that are best captured by performance indicators. Academics may even be tempted to engage in 'game playing' to satisfy the strict definition of performance. PBF, if based on ex post evaluation will inevitably focus on past performance rather than current performance, let alone future potential. As a consequence, the status quo is reinforced. A PBF system runs the risk of turning into a machinery that is 'backing the winners', instead of one that is 'backing the challengers'. Picking the indicators and areas to which funding is tied will always be one step behind the developments at the frontiers of science.

Third, PBF can make organisations disregard their responsibility for the overall responsibility of the higher education system, say the 'public good'. Because of the competition it induces, there is a danger that universities are less prepared to share their expertise with other universities. Sharing may mean losing one's competitive advantage. So, while the performance of a single university is good, the performance of the system as a whole is less than optimal.

Given the advantages and the disadvantages of PBF, what then should be our conclusion with respect to the use of PBF for the resourcing of higher education? The answer – though speculative – points at a *mix* of funding systems, where PBF – based on a multidimensional performance assessment – is combined with traditional input-oriented approaches.

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Author

Dr. Ben JONGBLOED || Senior research associate || Center for Higher Education Policy Studies || University of Twente ||
holds a Master's degree in Econometrics from the University of Groningen and a PhD in Public Administration from the University of Twente (topic: Modelling government expenditure in a macroeconometric framework).

Since joining CHEPS in 1993 he has carried out research on a wide range of projects, mostly in the area of higher education economics and finance. He has written extensively on topics such as funding methodologies, student financial support, marketisation, financial management, and per student costs. As a staff member of CHEPS he has been involved in commissioned research projects, training seminars and consultancies on the area of higher education policy and institutional management.

Contact: Capitool 15, NL-7521 PL Enschede, The Netherlands

http://www.utwente.nl/cheps

B.W.A.Jongbloed@utwente.nl