International comparative research: tricks of the trade?

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Introduction

Many handbooks on research methodologies and statistical techniques are available. This rich literature source addresses the three basic questions all researchers have to answer: What do we want to know? How do we measure it? And what data can be found to provide an answer to our central question? This article suggests a methodology which might be used in dealing with international comparative research projects. Via a case study, the paper will show the way one particular research project was dealt with. As such, we will indicate our basic questions, the difficulties and pitfalls we came across, and our solutions in an international comparative study on the relative performance orientation of public funding mechanisms for universities. We use a step by step approach following the research project that resulted in the article: Keeping up performances: an international survey of performance based funding in higher education (Jongbloed and Vossensteyn, 2001).

International comparative research: a special branch?

International comparative research requires a method of analysis which focuses on the characteristics of different countries, often on a specific subject, in order to identify similarities and differences. International comparative research is a specific branch of research, because it focuses on countries rather than on sub-national entities and organisations.

Goedegebuure and Van Vught (1994) noted a number of difficulties that make (international) comparative research a complex and problematic area of study. First, the problem of equivalence, which refers to the difficulty of finding equivalent (similar) units of study in different countries. The second problem relates to the number of cases that can be compared. Limited time frames and difficulties in obtaining valid cross-national data often limit the set of countries which can be used. The third problem relates to the internal variation within countries. A fourth problem concerns the question of whether the observation of a specific aspect of a country will permit a general statement about the country. The fifth and final problem is the so-called Galton’s problem, meaning that one cannot be sure the extent to which the characteristics of the object of study in a country are autonomous, or how much is caused by the relationships with other countries.

Regardless of the recognition of the multitude and complexity of the problems related to (international) comparative research, many comparative researchers easily pass over the methodological issues. Others focus strongly on particular difficulties which must be overcome in comparative research. Many international comparative higher education studies are not intended to analyse causal relationships, but rather describe the state of the art and experiences in similarly minded countries. How did other governments solve similar problems? What can be seen as best practice on a given subject? Many international comparative studies thus focus on similarities and differences between national arrangements, but not so much on the question why these similarities and differences exist. Even a relaxed attitude leaves international comparative researchers with the task of being clear on the questions to be answered, the indicators to be chosen and the data sets to be used. Additional background information on the wider context of the issues addressed is often required. In practice data sets often show (slight) differences because of variations in definition and conceptual explanations.
Below is a step-by-step analysis to identify the way we dealt with the difficulties of international comparative research in a study on the relative performance orientation of public funding in eleven countries.

**Research question**

Based on the widespread public interest in issues such as value for money, quality, accountability and market-like mechanisms for the management of the public sector, we were interested in the extent the phenomena have been used in the higher education sector. Though governments are still the primary source of funding of higher education, public policy and the literature argue more and more for market-like mechanisms and “marketisation” in higher education. In short, market mechanisms are viewed as a way to increase competition among higher education institutions. Therefore, institutions have to become more responsive to their customers (e.g. students, business, etc.). Higher quality and flexibility, it is argued, will come from increased responsiveness.

As one of the major yardsticks used by governments, it was a logical step to concentrate our research on the funding mechanism for higher education institutions. Do funding mechanisms encourage institutions to compete? An additional step concerned the way in which funding mechanisms stimulate competition. The most common elements to create competition for funds is to make funding dependent on targets, or more generally performance. In addition, there has grown a widespread interest in the area of performance based funding in the public sector. Based on that, we came to the following research question:

*To what extent do public funding authorities use measures of institutional performance for deciding on the universities’ teaching and research grants and the size of these?*

**Measuring performance orientation of funding mechanisms**

**Limitations**

Because we were only interested to the extent governments encourage competition, our attention was limited to public funding models for higher education. More specifically, we only looked at public funding for teaching and basic research. Thus all ad hoc project funding and income from other sources, whether from business or public organisations, were ignored.

The analysis was restricted to universities, excluding all other types of post secondary establishments. One reason for this was to limit the scope of the study. Because governments often use different allocation models for universities and other post secondary institutions, looking at the university sector allowed us to include more countries in the comparative study. Second, universities are generally involved in both teaching and research and we wanted to include both dimensions, for they may be funded through different allocation mechanisms. Third, universities are preferred over other post secondary sectors, because new funding methods or ideologies are often first applied in the sector of the highest education level (universities). Finally, universities show more homogeneity across countries in terms of tasks, functions and levels.

A final limitation concerned the number of countries involved. Discussions on market-like mechanisms in higher education are predominantly observed in developed countries. In addition, we looked for a group of countries showing some common ground in terms of cultural background. Finally, we chose countries that have a considerable volume of information available. This made the study much easier given our limited time frame. Based on these considerations, the following eleven countries were selected: Australia, Belgium (the Flanders community), Denmark, France, Germany, Japan, the Netherlands, New Zealand, Sweden, the United Kingdom, and the United States.
Indicators

To answer the central question concerning the extent to which public funding authorities use universities’ performance to allocate teaching and research grants, we operationalised our question into three subsidiary questions:

1. **Do public authorities use a formula when distributing the core funds for teaching and research among universities?**
   Funding formulae based on objective criteria (e.g. performance) are a basic condition for allocating funds. Funding formulae facilitate comparisons between institutions and thus provide a clear insight into the distribution of funds (McKeown, 1996). This is more transparent than for example a mechanism based on negotiation. Funding formulae form a first indication and prerequisite for performance orientation.

2. **Do the main national funding bodies in the higher education systems involved incorporate information on institutional performance in their allocation decisions?**
   The second step is to see whether the allocation mechanisms include measures of teaching and research performance of higher education institutions. With performance we focussed particularly on outputs that to some extent can be controlled by the institutions. Examples are: the number of credits accumulated by students, the number of degrees awarded, the number of research publications, or the patents and licences issued. Other outputs can be less influenced by universities: the relative success of graduates in the labour market, those working in jobs related to their training, universities’ success in generating additional resources (contract teaching and research). We concentrated on the first category of outputs and the proportion of the public budgets for teaching and research that is allocated on the basis of these.

3. **What is the relative share of competitive research council funding in the budget of the university sector?**
   Research councils distribute (part of) the public funds available for basic research. This happens primarily on a competitive basis, because it often concerns project funding paying a great deal of attention to performance such as the quality of the research proposals, the (expected) outputs as well as the reputation and status of the researchers involved. As such, the relative share of research council funding in total university income can serve as an indicator of the rate of performance orientation in the public funding of universities.

These three questions served as our basic indicators of the degree of performance orientation in public funding of universities. The next section discusses the actual data used for measuring the degree of performance orientation in the public university funding mechanisms.

Empirical information: data availability and transformability into comparable units

Funding formulae

The question on the use of funding formulae primarily required a review of national documentation on the financing of higher education. We had to distinguish between the funding of teaching on the one hand, and research on the other. One could imagine that funding formulae are used for one part of the funding but not for the other part. Earlier experiences showed that many countries use different allocation mechanisms for teaching and basic research at universities. In some countries, the funds for teaching and research are integrated. This is the case in four of the eleven countries studied: Belgium, Germany, Japan, and New Zealand. This is argued from the point of view that academic teaching should be research based.

In the other countries, the core funds for teaching and research follow from separate funding models. A very dear example is Denmark, where teaching and research are funded through two different ministries. In France, universities negotiate (and sign) two separate contracts with the Ministry of Education: one for the whole institution (stressing teaching) and one for research. In the UK, Sweden, and the Netherlands,

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1 One could argue that the relative share of revenues generated from non-public sources also tells something about the relative performance orientation of higher education. However, we focused on the degree of performance orientation within the public funding mechanism.
the funds for teaching and research are based on separate formulae. In a tabular overview we showed that funding formulae are in widespread use for teaching and to a lesser extent for research. Also a mix of formula-based and non-formula funding can take place, as is the case with research funding in the Netherlands and Australia.

Next to the table showing whether countries use funding formulae for teaching and research at universities, we provided descriptions of the various funding models used to provide more nuanced information. For example, it turned out that it is not only interesting to know whether formulae are used to allocate funds for teaching and research, but also whether universities have freedom in using their funds in a way that they perceive best in competition with other universities. In all countries analysed (except Germany), universities are allowed to use their total budget in any way they see fit. This is known as lump sum funding.

The country descriptions also showed that many countries use different funding formulae for teaching and research, but that often some kind of interweaveness of teaching and research is implicitly available. This means that part of the budgets for teaching may be used for research and vice versa. For example, research funding can have a component that is (partially) based on student numbers, as in Australia and the Netherlands, expressing the close relationship between academic teaching and research.

Furthermore, the descriptions also showed that non-formula based funding mechanisms also leave room for performance orientation. For example, research funds often heavily depend on previous years' funding levels, such as in Denmark, Germany and Sweden (incremental funding). But non-formula based mechanisms also include contracts between universities and the funding authorities responsible for research (France and the USA). These latter contracts might also include performance measures.

Nevertheless, countries where the core funds for teaching and research are mainly distributed on the basis of a formula may show considerable variety when more closely analysed. In our overview of the eleven countries we concluded that the funding of teaching and research include a mix of formulae, history and negotiation. For the teaching component, often the emphasis lies on formulae, while for the research component most countries use multiple funding approaches.

### The degree of performance orientation in university funding

Knowing that the eleven countries show considerable variation in the way they allocate funds to universities, the central question now is how we found/measured the extent of performance orientation in the allocation mechanisms. Therefore, we looked at whether the funding systems (formulae) are driven by output or input indicators. As such, we used the following list of (possible) input and output measures.

#### Overview of input and output indicators for teaching and research

<table>
<thead>
<tr>
<th>Inputs (/throughputs)</th>
<th>Outputs</th>
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</thead>
<tbody>
<tr>
<td>Teaching</td>
<td></td>
</tr>
<tr>
<td>New entrants</td>
<td>Credits accumulated by students</td>
</tr>
<tr>
<td>Students</td>
<td>Graduates (i.e. degrees awarded)</td>
</tr>
<tr>
<td>Staff</td>
<td>Graduates’ success at labour market</td>
</tr>
<tr>
<td>Material</td>
<td>Graduates’ jobs relation to training</td>
</tr>
<tr>
<td>Capital</td>
<td>External teaching contracts</td>
</tr>
<tr>
<td></td>
<td>Previous year’s budget</td>
</tr>
<tr>
<td>Research</td>
<td>Research publications (quality &amp; quantity)</td>
</tr>
<tr>
<td>Staff</td>
<td>Graduate degrees (PhDs)</td>
</tr>
<tr>
<td>Postgraduate students</td>
<td>Patents &amp; licences</td>
</tr>
<tr>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Capital</td>
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<tr>
<td>Previous year’s budget</td>
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As far as research is concerned, we only addressed the core funds for research directly given to universities. Research council funding is discussed in the next section. To determine the relative degree of performance-orientation we analysed whether the public funding mechanisms for teaching and research (e.g. formulae and contracts) include output indicators or input indicators.
If funding mechanisms make use of output indicators, it is even more important what proportion of the budget is determined by these output indicators. However, these proportions are not always easy to determine. In some countries, a clear percentage of teaching or research funding is based on outputs, but in other countries this is not fully clear, particularly if magnitudes depend on the previous year’s budget. In countries where contracts are used, such as in France, Denmark and Sweden, the individual characteristics of these contracts make it difficult to provide an overall national picture. So, determining relative performance orientation of the university funding mechanisms in the eleven countries considered, we resorted to a more qualitative judgement. We used a 4-point scale separated for teaching and research (excluding research council funds): fully output-oriented; primarily output-oriented; primarily input-oriented; and fully input-oriented.

Our analysis showed that, with a few exceptions, there is not a high degree of performance orientation in the funding of universities, for teaching or research. With respect to the core budgets for teaching, Denmark seems to be the only country to employ an example of output-oriented funding of teaching in our sample. As regards the funding for research, the UK shows the strongest performance orientation.

The share of research council funding

So far we left research council funding out of the analysis. But many governments distribute part of their research funding through research councils. This generally happens in a competitive process, in which the quality of the research proposals, the (expected) outputs of the projects as well as the capacity reputation and status of the researchers are important. As such we define this type of funding as fully performance oriented. In other words, the proportion of research council funding can very well affect the relative performance orientation of research funding in a university system. To measure this, we looked at the proportion of universities’ income that comes through the research councils.

The conclusion was that two groups of countries can be distinguished. One group contains countries where research council funds represent only a relatively small amount of university revenues (Australia, the Netherlands, New Zealand, the UK, and — to a lesser extent — Germany). The other group includes countries in which research councils account for more than 10 percent of universities’ revenues: US, Japan, France, Denmark, Sweden and Belgium.

However, these data turn out to be a bit problematic, since some countries have their major research institutes integrated in the university system, such as in Belgium, France, Japan, Denmark and the US. These institutes in general receive substantial institutional grants through the national research councils. In other countries, like Germany, the Netherlands and the UK, similar institutes operate independently from the university sector. As one can imagine, such differences in national research infrastructures provide difficulties in comparing the relative performance orientation of university funding mechanisms. Not including research council money would leave out an important part of the performance oriented funds, but including them provides a slightly skewed picture. Though we could not compensate for this distortion within the framework of this project, we regarded it better to include these findings.

General comparison

To provide an overall comparative evaluation of the extent to which the funding of universities is performance oriented, we put all country scores in a diagram. The diagram gives only a tentative indication of the relative performance orientation in public university funding in the eleven countries. The diagram presents a distinction between teaching (the horizontal axis) and research (vertical axis). Along the vertical axis we integrated the relative importance of research council funding and the role of outputs in the supply of the core research funds.

The diagram shows substantial variation, though the role for output indicators in the funding mechanisms still is relatively small for the 11 countries. This is in contrast with the increased attention for issues of accountability, value for (public) money, and performance based funding methods. It seems that many governments prefer to apply a somewhat soft approach to performance enhancement, relying on other mechanisms rather than relating funding to output levels.
Discussion

This paper showed the methodology employed in an international comparative research project. The fundamental problems of doing international comparative research already emerged with the formulation of a central research question. We limited ourselves to national funding mechanisms, whereas performance orientation can also be visible through national quality assurance (or accreditation) systems, student or graduate monitoring, etc. The study was also limited to a set of eleven countries. One could argue that including other countries could have increased the variety and the output-orientation found in our study.

With regard to the information and data used it seems that the indicators were not as straightforward as expected. The use of formulae (or not) has limited meaning, the output indicators have not been given weights, and it was not easy to determine the relative importance of the indicators used in contract funding mechanisms. In addition, the university teaching and research infrastructure may differ between countries. One can think of differences in quality and level of study programs, but the types of research integrated in the university system are important. Finally, the overall conclusion that the level of performance-based funding is disappointing can also be put in a different perspective. Had we taken a longitudinal perspective, for example focusing on the changes in funding practices over the 10 years, then we could have come to other conclusions.

All in all, though the original paper gave an interesting overview of the extent to which public university funding is driven by performance in various countries, it also shows that it is very difficult to provide the ultimate answer to such a question. The wide variation in the characteristics of higher education systems makes an objective and equal comparison difficult. National traditions and contexts that partially determine the way in which national allocation models are formed and operate in practice, force researchers to give their own interpretations of such mechanisms. Such interpretations are vulnerable to biases.

References
