Analyseinstitut for Forskning

Benchmarking - and ranking of publications. CASE: Economics, Management and Finance

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Working papers 2002/9
Analyseinstitut for Forskning
ISSN 1399-8897

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November 2002

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CASE: Economics, Management and Finance

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Keywords: Benchmarking, Ranking of publications

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Acknowledgements: This Working Paper is a part of the project 'Benchmarking at Universities' financed by The Danish Institute of Studies in Research and Research Policy and headed by Research Director Peter S. Mortensen.

The WP was made during a period where I interviewed a number of researchers and head of departments in Denmark. A number of them supported me with important comments and information. Among these are:
Professor Poul Houman Andersen, *Department of International Business, The Aarhus School of Business*;
Professor Tom Engsted, *Department of Finance, The Aarhus School of Business*;
Professor Svend Hylleberg, *School of Economics and Management, University of Aarhus;*
Associate Professor Bodil Olai Hansen, *Department of Economics, Copenhagen Business School*;
Associate Professor Peter Lotz, *Department of Industrial Economics and Strategy, Copenhagen Business School;* Associate Professor Jens Leth Hougaard, *Institute of Economics, Copenhagen University;*
Associate Professor Troels Østergaard Sørensen, *Institute of Economics, Copenhagen University;*
Professor Hans Jørgen Whitta-Jacobsen, *Institute of Economics, Copenhagen University;*
Associate Professor Per Svejstrup Hansen, *The Royal Veterinary and Agricultural University, Copenhagen.*

Abstract

The main goal of this working paper is to discuss

- Potential use of benchmarking within management of university departments
- Possible connections between a benchmarking process and an evaluation
- Ranking of journals with regard to benchmarking
- Possible methods to weight different performance indicators

in order to support the discussion of *benchmarking* within Economics, Management and Finance.

The central case in the paper is Economics, Management and Finance.

The paper presents an introduction to management of university departments and to the idea of benchmarking.

Then a number of different ways to rank publications is described. The first focus is the referee process followed by focus on ranking of journals. After this a number of studies on ranking of departments and universities based on journal ranking is presented. Some departments have adopted a list of CORE-journals, which is then discussed. The section ends with a presentation of ranking of university departments by the use of DEA.

The paper ends with a suggesting of possible inputs and outputs to a benchmarking project within Economics, Management and Finance where a number of departments are involved.

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1. Introduction and background

University department managers[1] use a number of methods and tools to maintain and improve the performance within research, teaching, and administration; one of these managerial tools is benchmarking.[2]

In the development of the research performance of the faculty[3] managers focus on the future outcome of the research and they use information on the present research in order to do so. Key information is the quality and quantity of the published articles, books, working papers, etc., one indicator of quality of an article is the reputation, the rank of the journal where it is printed.

From the beginning of the benchmarking discussion at research institutions in Denmark the quality of publications has been a key issue. Ranking of journals within *Economics, Management and Finance* is not a new. It has been used to rank departments and applicants, and to formulate publication strategies.

In the autumn 2001 the *School of Economics and Management, University of Aarhus (UA)* and the *Institute of Economics, University of Copenhagen (UC)* started to work on a benchmarking project, independent of each other.

The *UA, School of Economics and Management* contacted the *Danish Institute for Studies in Research and Research Policy (AFSK)*. Together they invited a number of university departments to a meeting to discuss a benchmarking project in March 2002. This meeting was followed up by a number of interviews with managers of departments within economics, management, and finance.

The interviews of the department managers indicated, that some prefer international refereed journals ranked in one way or another (into 'top' or 'core' journals vs. other journals) to be the main focus; Other departments would prefer a project with a number of indicators of quality and quantity of research as well as teaching. All departments had international connections, and some pointed out that expanding the project from Denmark to Northern Europe would be useful.

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[1] In Denmark and number of other countries the head of department is also the manager of the department. This working paper is focused on the managerial work regardless of who the manager is he or she could be the head of department, but it could also be another person.

[2] Information on benchmarking can be found at http://forum.europa.eu.int/irc/euradmin/eubenchmarking/info/data/en/ebnsite/benchmarking.htm

[3] Use in the meaning 'scientific staff members' and not as a translating of the Danish 'fakultet', i.e., as a unit of the university.

It was also indicated that it would be useful with a broad written presentation of

- Potential use of benchmarking within management of university departments
- Possible connections between a benchmarking process and an evaluation
- Ranking of journals with regard to benchmarking
- Possible methods to weight different performance indicators

The main goal of this working paper is to discuss these issues in order to support the ongoing discussion.

In section 2 the connections of management, evaluation and benchmarking in a university context are introduced as well as a model of the production-performance function of a university department.

Section 3 starts with a brief introduction of possible use of journal ranking in benchmarking. It is followed by a number of empirical works dealing with ranking journals and departments. A large number of works on ranking is based on a very limited number of outputs, often just one: articles indexed in Social Sciences Citation Index (SSCI); this can partly be explained by tradition and partly by lack of information. This section is mainly based on papers printed in scientific journals.

Then a model that deals with a number of outputs is presented together with some empirical results from Denmark.

A number of conclusive remarks together with a suggestion of a number of essential quantitative indicators are found in section 4.

2. Management at university departments, benchmarking and evaluation

2.1 Management at university departments

Department managers at universities concern themselves within three different areas: teaching, research and administration (Langberg 2000 & 2002; Graversen et al. 2002; Morris 2002; Schmidt 2002). Managers can be regarded as a part of the administration themselves. The specific role of a department manager differs from department to department, partly due to different rules at different universities and countries.

Some university departments are both research and education units e.g. the units have the responsibilities of a BA-study, a MA-study and a Ph.D. study beside their role as research units. Other university departments are solely defined as research units, where the researchers (can) teach at courses that are parts of different studies or educations lines at the university; at those universities study units cross the department boarder and the total organisation can be described as a matrix organisation. In Denmark the *UC, Institute of Economics,* and the *UA, School of Economics and Management,* belongs to the group where the research and education unit is the same (but have two managers: a head of department and a director of studies), where all other university departments (focusing on research in economics, management and finance) in Denmark belongs to a matrix structure. Some Danish departments are mixed with respect to fields: e.g., mixed departments of economics and political science. The difference in organisational structure is found in a number of other countries.

Traditionally researchers at Danish universities have large autonomy with regard to the subject of research as well as the methods. As a consequence, the department managers need to co-ordinate the wishes of a number of researchers and the strategy of the department as a whole.

An important part of management at universities is management of the knowledge capital, human-resource management and/or knowledge management regarded as improvement of the staff performance. Key issues in this improvement are formulating of future goals, strategies to reach them as well as evaluating of the past and present performance.

From a practical point of view, managers need information on the research and the teaching performed by the staff in order to develop staff performance.

This is seen in Figure 1.

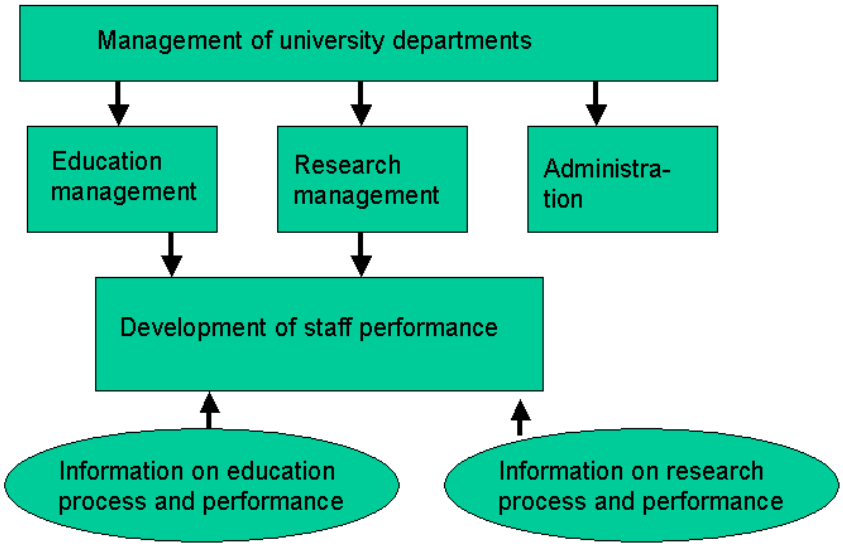
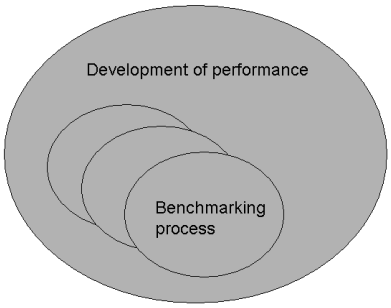


Figure 1

Management at university departments and development of staff performance

Development of performance is an ongoing management process and benchmarking is one of the tools that can be used. Evaluation is observation of the performance up to a specific point or during a specific period. This is showed in Figure 2 and 3.



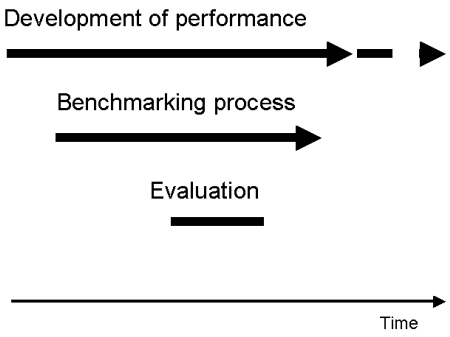


Figure 2 **Figure 3**

Development of performance, benchmarking process and evaluation

2.2 Benchmarking research units

The fundamental idea behind benchmarking process is that one or more organisations are identified as 'best practice' in a specific area and that the organisations together enter into to a leaning process, where the 'best practice' is the representation of the target in the first round. Later the targets can be discussed in a dynamic, strategic set up, that gives all organisations including the 'best practices' a possible new look at their strategies. Differences between the 'best practice' organisation and the others are used as information nodes.

Benchmarking can be carried out by two or three benchmarking partners that enter into a co-project or by a number of organisations or firms that form a benchmarking group. The organizational form is depending of the goal of the project.

In some cases an organisation use benchmarking made by other organisations, in this case reports from similar organisations can be used as starting point.

Behind the idea of benchmarking process lies the picture of a performance- or production- function as showed in Figure 4.

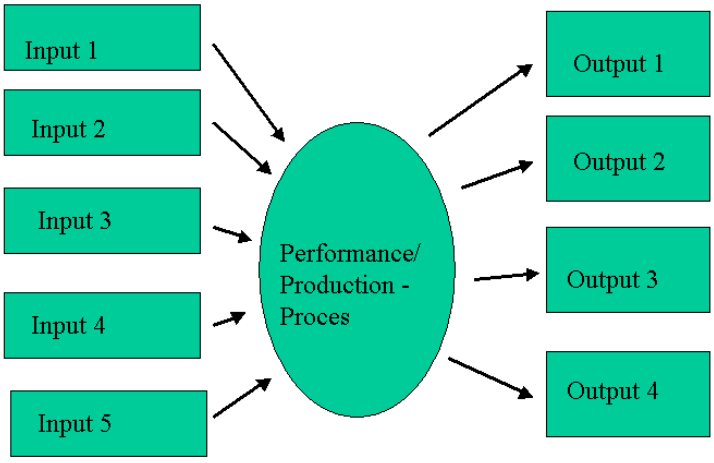


Figure 4

The production/performance function and its inputs and outputs

As seen in Figure 4 the performance/production function (p/p-function) is the generator of the outputs. Universities are in a number of ways similar to other knowledge organisations, and the

p/p-function can be described as a production function as well as a knowledge generative and transformation process. One model of a knowledge generating p/p-function is seen in Figure 5

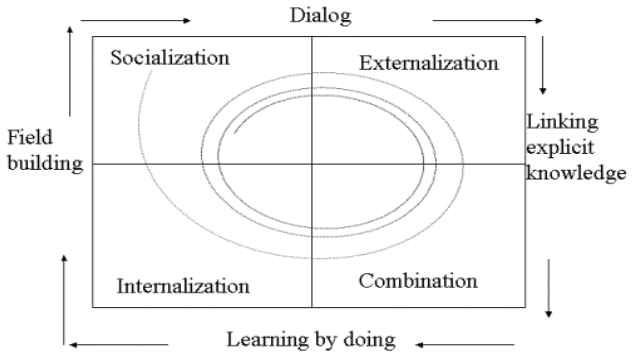


Figure 5
The Knowledge Spiral (from Nonaka et al. 1998)

Nonaka et al. (1998) assume that new organizational knowledge is created by human interactions or exchange among knowledge workers that possess different types of tacit and explicit knowledge. The interaction processes within the organisation are focused on four nodes of knowledge transmission:

- **Socialization**: from individual tacit knowledge to group tacit knowledge
- **Externalisation**: from tacit knowledge to explicit knowledge
- **Combination**: from separate explicit knowledge to systemic explicit knowledge
- **Internalisation**: from explicit knowledge to tacit knowledge

The four nodes can be seen as the background for the knowledge spiral, that may be started with a *socialization process:* in a socialization process tacit knowledge is exchanged between the group members, this is seen in research environments where emphasis is placed on the social working environment, e.g., on informal meetings at lunch, at coffee tables etc. where the subject of knowledge are build up. This could be described as *field building.*

This tacit knowledge can then be enlighten by *dialog,* in this case the knowledge is described and thereby made explicit in the *externalisation process.* The externalisation process makes *linking*

with explicit knowledge from other individuals or other organisations possible and provides the base for the *combination process*, where explicit knowledge of different kind is combined. Nonaka et al. describe some of those that combine newly created explicit knowledge with existing explicit knowledge as R&D-personnel. And a central part of the research process is the combination of explicit knowledge found in journals, conferences etc. that later result in publications etc. One place to measure the research performance in the spiral could therefore be the place where the explicit knowledge is linked, i.e., a measure of the publications and patents.

This new combined knowledge is then transformed into internalised tacit knowledge by *learning by doing* in an *internalisation process*, a process very often induced during the education of the students, the number of graduates and/or their later success at the labour market could therefore be another focus point for a benchmarking process.

The circular transmission movement increases the knowledge stock in each tournament.

The model in Figure 5 is a dynamic model, as well as the model in Figure 4, when it is specified with time subscripts.

Several stages are found in a benchmarking process. The stages according to The Danish Institute for Studies in Research and Research Policy for a benchmarking process at university departments are seen in Box 1.

BOX 1. Stages in a benchmarking process at a research unit

1. Clarifying the purpose of benchmarking by an internal discussion initiated within the research unit
2. Identifying and inviting other research units that might join the project
3. Discussing and identifying:
   a. Possible indicative quantitative measures of input, output, and process variables
   b. Methods to weight the information in order to find the 'best practice'.
   At this stage other potential project participants can be contacted.
4. Collecting quantitative measures and (qualitative) case descriptions
5. Drawing up an internal report based on the quantitative measures, where 'best practice' units are identified and compared to the other units; where the case descriptions are used as information items in order to identify possible ways of change
6. Arranging meetings between identified benchmarking partners
7. Conducting case studies based on the quantitative report and interviews and/or other qualitative methods in order to identify the differences in process that can be regarded as explanation of the differences in performance
8. Evaluating the project at a conference and/or workshop(s) where the final results are presented to the participants and lessons learned as well as methods are discussed. A report is written as documentation of the project.
9. Using the results of the benchmarking process to reformulate the unit's strategies and performance goals.

All inputs, outputs, and processes are taken into account: indicators of both input and output must be identified in stage 3.

When inputs and outputs are identified, the participating units submit the information on the indicators to each other and/or the coordinator of the project. Then the 'best practice' organisation(s) is (are) identified. 'Best practices' are the organisations that perform best with regard to the indicators - measured by the method agreed upon in stage 3. After the identification of the 'Best practices' the differences between them and other organisations are measured and analysed. Qualitative information like differences in social organisation, access to resources, etc., is added to the investigation and possible differences in the performance processes are identified in order to point out possible strategic changes that could alter performance.

Key issues in benchmarking are identifying of indicators of quality and quantity of research performance as well as the follow up by organizational changes. Information on the research performance is also essential for different forms of evaluation:

- When hiring or promoting researchers, the most important issue is the estimation of the applicants future teaching and research performance. This estimation is based on a number of information of which former research plays a great role. One key piece of information is the published research, and this can be regarded as an indicator of the quality and quantity of the research to come. In this process every single publication is evaluated.
- When evaluating whole departments or research environments other tools must be taken into account than an evaluation of every single publication from staff members of the unit; indicators are chosen instead. It is often sufficient to compare the publication profile with the strategy of the department and to the profiles of other similar research units.

University managers face three types of evaluation:

- External evaluation by department level (or other levels involving groups of staff members) often initiated by ministries or owners
- Self-evaluation at department level, initiated by the university
- Evaluation of single staff members as part of the ongoing process including annual evaluation and evaluation for promotion purposes

Obviously information on the research performance is needed for all levels of evaluation. One way to obtain some of the needed information is to use data already collected for benchmarking purposes or to join or start a benchmarking project. Resources spend to collect some of the information to an evaluation project or benchmarking process can then be regarded as resources used to develop the performance of the department.

3. Ranking of publications

A key indicator of quality and quantity of research is the number of widely cited articles published by the staff in international and national 'top' journals, the number of widely cited dissertations, scientific books, that the staff writes or edits, etc.

Different disciplines and departments have different traditions and strategies, which is reflected in different publication profiles even in cases with excellent performance. One example is the

difference between chemistry and economics: the faculty at the top 12 chemistry departments in USA published on average 6.4 articles per faculty, while the equivalent figures in economics is 1.2 (Huettner and Clark 1997). These differences impede simple comparison of departments and require that some investigations on the differences are made before the collection of data for benchmarking.

Most of the recent studies on research publications focus on articles in refereed scientific journals. Some studies note that other forms of publications have large impact in the research environment and society as a hole.

According to Kaufman (1999) some works of excellence are not recognised as such by the referees of academic journals. His example is based on *The Merton and Scholes Nobel Prize Acceptance Lectures* that Merton and Scholes gave upon receiving the prize in 1997. Scholes recalls that their peers (and editors of the journal) rejected Black's and his initial paper (on the Black-Scholes option-pricing model). Only after 'friendly' intervention the editors did see its importance. The Merton and Scholes lectures tell the story behind the option-pricing model and refer to a number of other academic works. The distribution of cited works is shown in Table 1.

Table 1

References cited by Merton and Scholes in their Nobel Prize lectures by Publication Outlet

Outlet*	Number of references (Merton and Scholes)
Journals	128
Authored Books	20
Edited Books	14
Working papers	5
Newspapers	1
Dissertations	6
Miscellaneous	3
Total	177

Source: Exhibit 1. Kaufman 1999.
*The Kaufman exhibit includes more information on the different types of outlets

Kaufman concludes that

> *"Previous analyses ranking journals have failed to examine the importance of both books and papers published in books. It is therefore somewhat surprising that 20% of the references cited by Merton and Scholes were authored books (20 references in 16 different books) or to edited collections of papers published in books. This large number suggests that these contributions may not be receiving the credit that they deserve in influencing thought and scholarship in finance and their impact deserves further exploration"*

As implied by Kaufman, refereed articles and citations from them are key issues, partly because this kind of information is easily accessible, but articles do have a large impact - as shown by the number of references in the two lectures by Merton and Scholes.

Still, scientific articles play a key role in the research environment even that a number of important works of research are published other places than in articles, in subsections 3.1 and 3.2 the referee process in journals and the citations criteria are presented and discussed. In subsection 3.3 the ranking of departments based on articles in journals is discussed. Subsection 3.4 deals with formal lists of journals as part of publication strategy. A model with more than one form of publication and weighted by the size of the department is presented in subsection 3.5

3.1 Referee process

One criteria of quality of scientific work that any scientist would approve is that the article/book has been through a referee process where someone -- often anonymous -- has read the material and given his or her criticism based on standards of the specific field or discipline.

Every scientific journal has an editorial board and a number of referees that reflect the field and standard of the journal. Thus articles published in a journal have already gone through the first evaluation: they passed the referee process.

The referees hold a central position, which is a position both analysed and discussed. In the review article *'Peer Review for Journals as It Stands Today'* by Campanario (1998), a large number of previously published works are presented. The first part is on *"the participants in the system (the appointment mechanism of editors and referees, and reviewer tasks and qualification)...systemic problems of reliability, accuracy, and bias"*, where current research on *"fraud, favoritism, and self-interest*", etc., is presented in part 2.

Campanario states that

> *"Because peer review constitutes such a key part of science, it would be natural to assume that is has long been a major object of study, and that study of peer review ought to be a strategic goal analyzing the dynamics of science and the patterns by which new knowledge is transferred. However, research on peer review is relatively recent and scarce; many discussions of it are based on personal observations rather than systematic data gathering (Scharscmidt et al. 1994) It is an area that is understudied (Kassirer and Campion 1994) uncomprehended and uncharted (Peters and Ceci 1982b, 252)...."*

While Campanario deals with the referee system from a number of fields, including chemistry, medicine, sociology, and economics and his articles can be seen as a general introduction to the issues, Hamermesh (1994) studies journals within economics, and Tanner (2000) journals within finance.

Hamermesh (1994) asked editors of eleven journals to keep record in *'next 50 requests for reports on initial submissions of articles... seven editors agreed to keep the records beginning in November 1989.'* The final sample included 343 records from four general journals and three subdiscipline journals.

Every record of the articles was linked to information on the referee: gender, years since Ph.D., citations from SSCI in 1989 (the referees were grouped into 3 groups: 12 % had 50 or more citations, 40 % had from 10 to 49 citations), 32 % had published in the journal in the period 1986-1990 a percentage that varied from 6 % to 54 %, and on average 12 % belonged to the same school as the editor.

The journals with the highest impact factor had in general the referees with the highest number of citations, with one exception -- one of the general journals had referees where 'only' 22 % had more than 10 citations.

Hamermesh concludes that

> *"The best answer to the question of this section is that referees are disproportionately the top people in their speciality. But editors also rely heavily on scholars to whom they have easy access."*

Tanner (2000) starts with the 12 finance journals covered by Social Science Citation Index, he then adds *"the Financial Review because it is typically included in the list of "core" finance journals in similar studies."* Two journals were taken out of the data because they do not identify referees (by name) and one because the journal *"emphasizes an editorial board over referees in the reviewing process."* The final ten journals are listed in Table 2.

Table 2.

The set of ten journals within finance, their abbreviation and rank used by Tanner (2000)

Journal	Abbreviate	Rank based on impact factor*
Journal of Financial Economics	JFE	1
Journal of Finance	JF	2
Review of Financial Studies	RFS	3
Financial Management	FM	4
Journal of Financial & Quantitative Analyses	JFQA	5
Journal of Money, Credit and Banking	JMCB	6
Journal of International Money & Finance	JIMF	7
Journal of Banking & Finance	JBF	8
Financial Review	FR	9
Journal of Financial Research	JFR	10

*Impact factor see section 3.2

Out of the 3399 identified referees 67 % are professors of finance, and out of these 955 (42 %) are full professors, 758 (33 %) associate professors, and 570 (25%) assistant professors. On average 43 % had published in the journal (until 1998) and on average 74 % were also referees for other journals. Tanner presents a number of regressions models showing that referees characteristics are highly correlated with the journal impact factor.

Tanner concludes that

> *"Starting at the top of the Impact Factor listing, it is clear that both JF and JFE rely on a "club effect". Both journals publish heavily cited articles and both selects nearly 80 % of their referees from their lists of authors... The third journal on the list, RFS, takes a different approach. RFS's referees have significantly less experience, have fewer publications ... RFS likely places a heavier emphasis on referees who are the younger researchers producing quality, "cutting-edge" publications, rather than merely trying to add lines to their vitae."*

It is essential to scientific journals that they have a procedure for evaluating papers, a procedure that secures that important new issues and results within the journals main subject areas are published and that the published papers have the appropriate scientific standard. The critical question is how should this procedure be? The idea of peer review, i.e., that scientist valuate other scientists papers and books is the traditionally way of evaluating papers within science, and until now no real alternative has been presented. So the core problem is how to select the reviewers in such a way that they do secure that new findings are published, that authors are given proper feed back etc. One way to secure this process is to discuss it openly, e.g., in editorial note on visions and strategies.

3.2 Ranking of journals

Journals can be ranked from a subjective point of view, i.e., every economist could have his or her own list, reflecting interests and ambitions. To get a general list of economics, lists from a group of economists could be merged into one, and this list could be regarded as an inter-subjective list reflecting the interests or strategy of a specific group or department. Another way to establish a list is to make a set of criteria and then let them determine the ranking order. It is also possible to combine the two approaches.

Another important criterion beside interests is whether the results of the work have impact on further research or society as a whole.

Citations could be regarded as an indicator of use and impact and thereby as an indicator of quality. Articles that are often cited may be regarded as more useful, more original and of better quality than others. Articles could be referred to because they are mistaken, or as bad examples of research; but in general economists tend to agree that often cited articles are of high quality, and that journals publishing articles that have a large number of citations are quality journals. This leads to a measure of quality of a journal: the number of citations from articles published in it.

The number of citations is calculated in a number of different ways according to the use of the calculation. The standard concepts are seen in Box 2.

Liebowitz and Palmer published their ranking of journals in Journal of Economic Literature in 1984. According to Laband and Piette (1994) their ranking where *"used at a number of colleges and*

universities to help to evaluate an individual 's scholarly "productivity" for purpose of allocating salary increases as well as making promotion and tenure decisions."

Box 2. Citations concepts with relation to scientific journals

- *Total citations* is the total number of times each journal has been cited by all journals in the actual database within the specific year(s)
- *Self-citations* are citations in an article of articles previously published in the same journal
- The *Journal Impact Factor* is the number of citations of articles published in the two previous years divided by the total number of articles in the two previous years
- The *Journal Immediacy Index* is the number of citations of articles published in a given year divided by the number of articles published that year
- The *impact-adjusted citations* are those assigned a weight based on the number of citations the journal is credited for in a given year for material published in previous years. Then the weighted sum of the citations is used in calculations instead of the sum of citations. (An iterative method formulated by Liebowitz and Palmer and later used by Laband and Piette (1994))
- *Cited Half-Life* is the number of publication-years from the current year that account for 50 % of current citations received.
- *Citing Half-Life* is the number of publication-years from the current year that accounts for 50 % of the current citations published by a journal in its articles references.

Note: More information can be obtained on www.isinet.com

The Liebowith and Palmer ranking was based on citations in articles printed in 1980 of articles printed in previous years, by the use of Social Science Citation Index (SSCI). They invented a method to adjust citations for impact.

In 1994 Laband and Piette published two new rankings based on the method used by Liebowitz and Palmer:
1. A ranking based on citations in articles printed in 1990 of articles printed in 1985 -1989. They started with the journals listed by Liebowith and Palmer and they added a few; some journals were excluded because of lack of data: they were not indexed in SSCI.
2. A ranking based on citations in articles printed in 1970, in this case only 50 journals were included, the information to the tabulations were given by the authors of the articles, e.g., not information from SSCI.

By the use of the three rankings made by the same method, Laband and Piette were able to comments on the development of the impact of the journals

> *"Although the top general-interests journals in economics have more or less maintained their prominence over the past years (in terms of ranking, not in terms of market share) there has been a decline in the influence of the most of the "second-tier" general-interest journals. Their bad fortune in this regard apparently results from the increase/importance of a number of speciality journals..."*

While Laband and Piette updated the work by Liebowith and Palmer, Burton and Phimister (1995) updated the work by Diamond (1989). Burton and Phimister use as Diamond the citations index from SSCI. Where Diamond used *"the total number of citations, the percentage of self-citations and the impact factor",* Burton and Phimister use *"citations by other journals, self-citations and citations by other journals 1984-1985".* As Diamond they regard self-citations negatively. In both cases the three factors are weighted so that each journal is allowed to 'choose' the weights that rank the journal best. Burton and Phimister use Data Envelopment Analyses (DEA - see section 3.5) they argue that self-citations can be regarded as 'input', e.g., negative outputs. This is a special use of DEA-analyse.

There is numbers of problems in the above use of Social Sciences Citation Index (SSCI). Davis (1998) points two:

- One problem is related to the fact that different studies of the ranking of journals within economics use different definition of 'economics journals' and as a consequence, starts out with a different number of possible economics journals. In July 1991 155 journals were classified as 'Economics & Business' in SSCI, out of these 23 were regarded as 'non-economics' by Laband and Piette (1994). In June 1991 Journal of Economic Literature listed 249 journals as 'Economics'.
- The second problem is that there exists an 'all other' category in the SSCI, in the making of the implicit ranking these 'all other' can either be assigned the weight 0 or 1, when the percentage of the citations from the different journals is calculated. This difference in method generates remarkable difference in the rankings.

Davis (1998) explains the first problem -- the difference in classifications as 'economics' -- with "*inherent difficulties in treating economics as a single, undifferentiated category".* He discusses the journals' 'economics-type characteristics' and argues

"that economics journals are heterogeneous products along two dimensions: (i) different journals producing different qualities of the same product, and (ii) different journals producing different products".

He also points that the focus on the 'top-journals' may lead to a situation where only a subset of all journals are ranked, which he regards as problematic:

"First, this would mean eliminating the great majority of economics journals from any sort of rankings. Second, doing so could well be argued to have a chilling effect on innovation in ideas in economics. Third, it would discourage economics research in areas with significant noneconomics content. Fourth, truncation would produce a set of core journals that continually changed at the margin, since for any core set some journals would enter and fall out of the set rankable journals over time according to their relative success."

A part of the problem is that exclusion of 'non-economics' from 'economics' may lower the ranking of some journals particular if they are (Davis 1998)

"(i) speciality or field journals that require significant institutional context, (ii) applied versus 'pure' theory journals, (iii) journals that include important interdisciplinary themes, (iiii) journals that depart from mainstream economics, and (v) journals that employ non-standard methods."

Barrett, Olia and van Bailey (2000) focus on the problem of different fields or subdisciplines by applying the method used by Laband and Piette to the 16 economics subdiscipline C through R in the Journal of Economic Literature (JEL) classification system.

In the introduction Barrett et. al (2000) state that:

"Journal rankings serve a multiple purpose in economics. Perhaps most importantly, many institutions use rankings, implicitly or explicitly, to evaluate faculty in hiring, promotion and tenure decisions. Rankings likewise inform allocation of increasingly scarce library funds for serials acquisition. Finally, journal rankings influence individual researchers' choices as to where to submit manuscripts and which journals to read.

...

Our concern is that most economists and economics departments today specialize in particular subdisciplines and thus find general disciplinary ranking of limited usefulness

In light of widespread specialization, it seems appropriate to supplement the existing general rankings ... with subdiscipline-specific rankings".

Not surprisingly they found that

"Unlike general disciplinary rankings, subdiscipline-specific rankings capture the dominance of many focused journals over their fields. Indeed, they reveal a fallacy of composition in ranking journals' impact: prominence in the small, at the subdiscipline level, does not equate to stature in the large..."

More surprisingly they found that

"Economics as a whole is clearly dominated by a 'holy trinity' of journals: the American Economic Review, Econometrica, and the Journal of Political Economy"

The rankings are made with and without self-citations (in the meaning citation from the same journal; box 2). because some of the journals in the subdisciplines are very dominant. If self-citations are taken out of the calculations they will drop out of the list. This is the case with 'Public Choice', the journal ranked as number 1 in code H (Public Economics) and Journal of Economic Education, the journal ranked as 1 in code I (Health, education and welfare). The results without self-citations are seen in appendix 1[4].

All of the above studies used SSCI in one way or another. This kind of ranking can be supplemented by others forms of ranking like 'Wiener-ranking' made at Vienna University of Economics and Business (Wirtschaftsuniversität, Wien) where more than 1800 journals are ranked[5] in categories. The journals in the Wiener-ranking are all in English or German.

Correlations between the Wiener-ranking and other rankings are investigated by Maier (2002) surprisingly some of the correlations are negative - but as Maier writes '*Alle signifikanten Koeffizienten wiesen jedenfalls die richtigen Vorzeichen auf...*'

Another list that comprehend different approaches is the 'Journal Quality list' compiled by Harzing (2002). This list is sometimes referred to as the 'Bradford list' because the first version was made while Harzing were affiliated at Bradford University School of Management. The Hazing list

[4] The table in the appendix was mailed to me by the authors. The result with self-citations is in the article.
[5] The ranking can be found online at http://www.wu-wien.ac.at/fides/rating-definition_en.html

includes information on ranking used in USA, the Netherlands, UK, Hong Kong and the Wiener-ranking.

Changes in citations will automatically change the ranking regardless of the way the ranking is done, if it is based on citations. The time-effect can be seen at William H. Starbuck homepage[6].

3.3 Ranking of departments and universities based on journal ranking

It is possible to count the number of articles in different journals written by faculty from different departments, universities and countries because the article databases bear information on the authors and their affiliations.

This is done in a number of articles published within the last years. The articles focus on specific scientific fields, types of colleges or geographic areas. One important work in the field of economics in Europe is the article by Kalaitzidakis, Mamuneas and Stengos (1999). Kalaitzidakis et al. base their analyses on articles in 10 journals (seen in Table 3).

The list is based on five criteria:

The first two reflect the number of citations

> *"First the market share with respect to citations of the first nine core journals (minus (EER) counts for about 60 % on average of all citations in the scholarly economics literature for the period 1970-1990 (see Leband and Piette, 1994 Table 5). Second according to Stigler et al (1995) these nine journals are the journals with the most citations...among all the general or macroeconomic journals in 1987 and 1988."*

The next two reflect reputations:

> *"Third, these nine journals are among the most prestigious journals in the economics profession... and finally, all of them are included in the Diamond list (see Burton and Phimster, 1995)"*

[6] http://pages.stern.nyu.edu/~wstarbuc links can be found under 'Citations of Journals Related to Business'

And the fifth argument reflect that the departments included in the analyses is European

> *"The last journal in our selection, EER, is also included in the Diamond list and it is selected because, as the official journal of the European Economic Association, it provides a natural outlet for European research"*

Table 3. The journals used in Kalaitzidakis, Mamuneas and Stengos (1999), their abbreviate and their AER standardized pages*

Journal name	Abbreviate	AER standardized pages (conversion factor*)
American Economic Review	AER	1.0
Econometrica	ECMCA	0.89
Journal of Political Economy	JPE	0.791
Quarterly Journal of Economics	QJE	0.645
Journal of Monetary Economics	JME	0.593
Journal of Economic Theory	JET	0.511
Review of Economic Studies	REstud	0.476
Review of Economics and Statistics	REStat	0.14
The Economic Journal	EJ	0.128
European Economic Review	EER	0.036

Source: Kalaitzidakis, Mamuneas and Stengos (1999)
* See text for explanation

After the selection of journals the next step is the choice of method: Should every article count as one? Should every page? Should the article/pages be weighted according to reputation or citation impact? Should an article with 4 authors count as 1 or as 1/4? Kalaitzidakis et al. decide that

> *"Since we want to measure the research output produced by the European academic institutions, article pages are allocated to the affiliation of the authors at the time of publication...In papers with n co-authors, each co-author was allocated 1/n pages of the article. In addition, when m affiliations were listed by the same author, then each affiliation was allocated 1/m of the pages that were allocated to the specific author.*
>
> *Another important issue is how to account for the differences in the 'quality and size'...Pages in some journals might contain more characters per page than others...Thus adjustments have to be made to convert all.... to equivalant units...Adjustment for quality is a more difficult and controversial issue...We imploy an 'impact adjusted citations per character' index taken from Laband and Piette (1994, Table A2)...This index adjusts both characters per page and quality of different journals to equivalent units. Therefore, all article pages are converted to AER standardized pages in term of quality and size."*

The conversion factors are seen in Table 3.

A number of other methods could have been used; Kalaitzidakis et al. (1999) mention that

> "An alternative way to adjust for the quality of the articles published is by using the actual citation impact of each article...The difficulty with this procedure is that it requires a tremendous volume of information"

Kalaitzidakis et al. (1999) does not include any information on input as the number of researcher, etc., as a consequence it would be natural to expect that minor department with fewer researchers would tend to be at the bottom of the list. The authors mention this as an advantage to stidents and other individuals, but in a benchmarking project this is not the case. Other methods could include the number of researchers of the department or other sorts of information on the input side.

3.4 Formal lists of CORE-journals

Some departments use formal lists of journals as a part of their publishing strategy, e.g., at some department an article printed in one of the top-journals results in extra bonus to the researcher(s).

Fleet, McWilliams and Siegel (2000) made a study on formal lists and their use in a number of academic departments. Fleet et al. reason that formulations of formal lists of journals can have numerous costs and benefits as listed in Table 4.

Table 4

Cost/Benefits of List Formulation

Costs (of development of a list)	Benefits
• It can be arduous and time-consuming • It might damage interpersonal relations • Compromises may lead to reward for mediocre work • May induce rigidity in research standards • Could discourage faculty from reading colleagues' work • Focus on inputs (articles) rather than on outputs (effect of contribution to the field) • Subject to biases and political processes • May hinder career development if standards are too intuitionally specific • Could overestimate actual productivity • Could disadvantage those who do specialized work, especially if they publish in newer journals • Could add to power of editors and review boards	• Provides an explicit measure of the value of research output • Establishes explicit publication targets • Reduces uncertainty in planning and evaluation • Provides guidance in publication strategies • Provides useful information on journal quality • Reduces time and effort in evaluations • Provides defensible information in grievance situations • Useful in benchmarking/baselining

Source: Table 1 in Fleet, McWilliams and Siegel (2000)

Fleet, McWilliams and Siegel (2000) argues, that there is no explicit theory underlying the development and use of journal rankings in management, but with the use of different sources of theory they present a number of hypotheses, which they test empirical:

Table 5. Hypotheses relating to the formulation of lists (Fleet, McWilliams and Siegel)

H1	There is a positive correlation between the size of department and the probability of adopting a list
H2	There is a positive correlation between the diversity of research interests represented within a department and the probability of adopting a list
H3	There is an inverse correlation between the quality of the department and the probability of adopting a list
H4	Management departments with faculty who have low levels of experience will be more likely to adopt a ranking
H5	The probability of adopting a list will be greater in public institutions that in private institutions
H6	The total number of journals in which management department faculty members publish and the average number of journals per formal list will be larger that previously published lists of journals
H7	The average number of journals and ranking lists used by management departments will be greater for larger departments than it will be for smaller ones
H8	The average number of journals and ranking lists used by management departments will not differ between public and private institutions
H9	The average number of journals and ranking lists used by management departments will be smaller for higher quality departments

Source: Fleet, McWilliams and Siegel (2000)

The study included 252 (a response rate at 50.8 %) departments and out of these only 35 (14 % of the responding departments) reported that they had a formal list while several indicated that they were in the process of developing one.

Only hypotheses 1 and 3 could be supported by a simple probit-analysis.

UC, Institute of Economics is the only university department within economics in Denmark that have a formal list of journals as part of a publishing strategy. It is the largest department of economics in Denmark with a scientific staff at approximate 78 researchers, with regard to quality it was evaluated as "*first rate by international standards"* in the international evaluation that were published in 1997 (based on data from 1994). There is a large 'diversity of research interests' at the department.

The UC- formal list of journals is based on the argument that articles should be read, e.g., cited and that articles published in journals with a large impact factor should 'count' more than articles published other places. Articles in international refereed journal are placed in three groups (as

seen in appendix 2) according to a list based on the report that Kalaitzidakis, Mamuneas and Stengos made for European Economic Association in October 2001: *Ranking of Economics Journals and Institutions in Economics*.

3.5 Ranking with more than one output and with different inputs

Until now only ranking with the use of number of articles in one way or another have been mentioned. The key issue has been how the articles should be weighted. Most of the works referred use some sort of valuation of the articles based on citations. The works use either the number of persons employed, the single individual researcher or the single department as unit in the analyses. A number of authors mention that their data are limited, some that researchers engaged in different fields might have different publication behaviour, and that the number of articles might not reflect the total research performance.

Other inputs could be used as information in a ranking process: Lately a ranking of German universities has been based on publications, grants, promotions and reputation (Berghoff et al. 2002).

The publications in the German ranking are grouped into five groups and assigned points according to size:
Up to 5 pages -> 1 point, between 6 and 10 pages 2 points, 11 to 20 pages -> 3 points, 20 to 100 pages 4 points and above 100 pages -> 5 points
And them corrected for numbers of authors:
1 author -> 1 point, 2 authors -> 0.5 point; 4 authors -> 0.25)

Another way to rank organisations could be to group them according to their main goal and make separate rankings for each group: Are they research universities, i.e., organisations with a large number of researchers and a relative small number of undergraduate students or are they other kinds of institutes? One could add another question to this: does it make sense to rank other that research department based on scientific publications?

Hartley and Robinson (1995 & 2001) show in their articles, which are based on research performance measured by articles published in scientific journals, that it does make sense to use articles when benchmarking Liberal Arts Collages[7]. It can't be expected that faculty members at

[7] This type of colleges is not (yet) common in Denmark, in other Nordic countries they are called 'Højskoler'.

Liberal Arts Collages publish in academic journals as much as faculty members at Research Universities[8], when the (underlying) input is number of persons and not number of persons-years (full-time equivalent) used on research. As showed in the articles, research published in journals does make a difference: there is a clear positive connection between the amount of articles and the number of students from the colleges that later receive Ph.D.s both in the fields of economics and sociology.

Hartley and Robinson (1995) base their ranking of economics research by the total number of pages in all JEL-listed journals and they adjust for number of Authors, Quality (they use the index score from Laband and Piette) and size of department. Later they count articles in top 50 and top 25 journals. Their results show that just one accepted article can change the ranking dramatically, and that size of department do matter: with the total number of 3 articles in the top 50 Grinnell College changes from rank 28 to rank 5 when adjusted for department size. This does point that the size of department is key information in a benchmarking process.

One restriction in the ranking based on the current databases is the limited sources of data: if other outlets than articles in scientific journals should be used as outputs, data must be collected directly from the departments and the analyses would require other methods. One could ague that different 'sorts' of researchers should count differently, e.g., that one would expect that full professors publish more often than others in top-journals. If the number of persons-years (full-time equivalent) connected with R&D[9] at different levels[10] was used as input units instead of just the department, or the (number of) persons, it would be easier to compare smaller and larger units and units with different types of obligations.

Some departments are research- as well as teaching units. In those cases it might be useful to compare the number of researchers to the number of research outlets and the number of graduates.

If data were collected directly from the departments, data on education-performance could enter the analysis.

[8] Universities, that have Ph.D. programmes.
[9] This measure is used in the international R&D statistics. All OECD countries collect data on R&D-personnel including number, gender, and person-years according to the Frascati-manual.
[10] Levels as: Professor, associate professor, assistant professor, post doc, Ph.D. student.

In Figure 6 the benchmarking model of a research unit is shown, the similar model for a research- and education unit is shown in Figure 7.

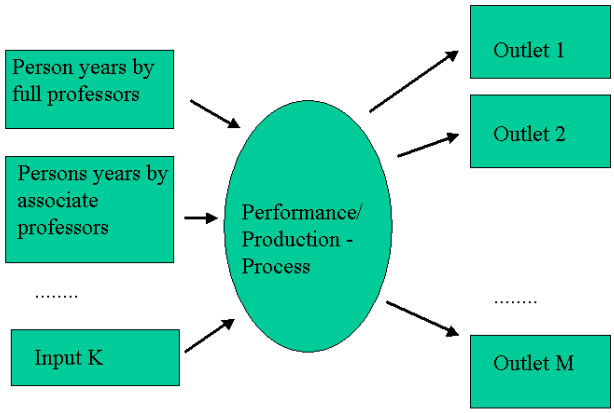


Figure 6

Benchmarking model of a research unit

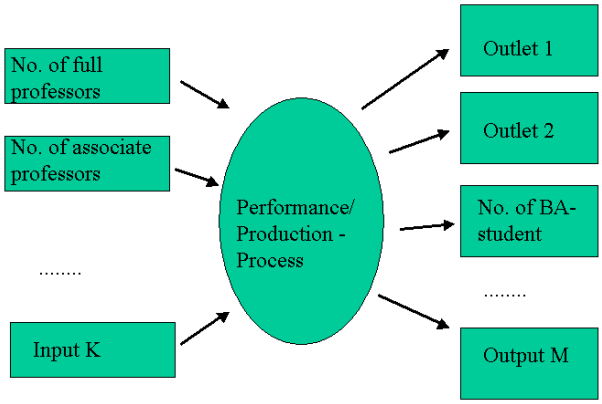


Figure 7

Benchmarking model of an education and research unit

In any case some weights must be assigned to the different in- and outputs when identifying the 'best practice' units. In many models market prices are used as weights, but in the cases shown in Figure 6 and 7 there is no market prices. The weights can be assigned in different ways: one could argue that articles should count more than books that should count more that working papers, e.g.,

$$weight_{article} > weight_{book} > weight_{working\_paper}$$

or

$weight_{article\ type\ A} > weight_{article\ type\ B} > weight_{article\ type\ C}$

The 'best practice' units are the units with the highest scores. Assignments of the weights are key issues in identifying the 'best practice' units.

3.5.1 Ranking university departments by the use of DEA

As mentioned there is no market price in the models shown in Figure 6 and 7, i.e., no prices that can enter into calculations. At the input side it would be straightforward to use the time spend on research, e.g., the number of or number of persons or better the number of persons-years (***py***) used for R&D[11] at the department.

Then the model can then be written as:

(articles in top-journals, articles in other journals, ...books)=

f(*py*-full professors, *py*-associate professors,.....)

or

$(y_1, y_2, y_3, y_4, \ldots\ldots y_m)=$

$f(x_1, x_2, x_3, x_4, \ldots\ldots x_k,)$

A function like this with no prices could call for a number of different approaches like a Quadratic Frontier Function (Bjurek and Hjalmarsson, 1995) or a Data Envelopment Analysis (Farrell, 1957)

The idea behind Data Envelopment Analysis (DEA)[12] is that this procedure will access the weights to every unit that gives the units the best score, e.g., places the unit in the closest position to 'best practice' or place the unit as 'best practice'.

An example with three units and two outputs are seen in Table 6 and Figure 8 and 9.

[11] According to the Frascati-manual

[12] For an introduction to DEA see William W. Cooper, Lawrence M., Seiford and Karoru Tone, 2000

Table 6.

A DEA-example with 3 units and two outputs

Unit	Books/faculty = y_2	Articles/faculty=y_1
A	16	8
B	4	24
C	8	12

As seen in Figure 8 the line from A to B 'envelop' C. Both A and B are at the line and they have a DEA-score at 1. If C should have a DEA-score at 1 and keep the relation between the production of books and articles (4:12), C should be located at C*. Both A and B are best practice with regard to C.

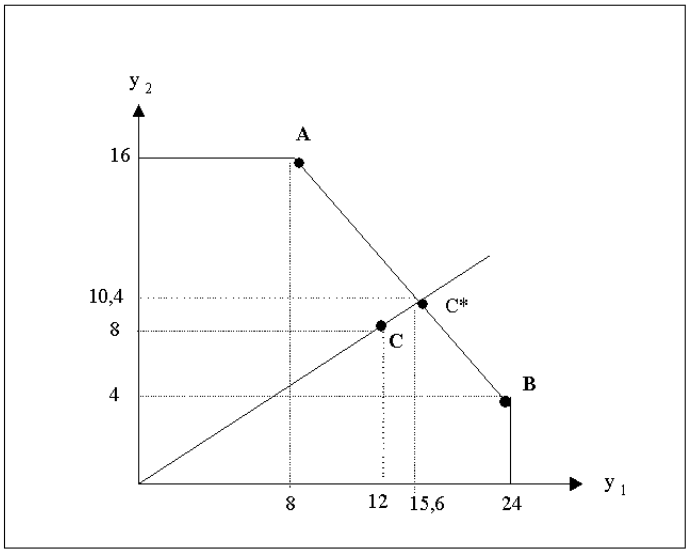


Figure 8

With more than two indicators of outputs, the system has to be solved by linear programming. Every unit *i* in the investigation is given the weights (u's and v's) that maximise the following function:

$$\text{DEA-score} = \frac{\sum_{J=1}^{m} u_j y_{ji}}{\sum_{r=1}^{k} v_r x_{ri}}$$

where the max DEA-score is 1, due to the constraint $\frac{\sum_{J=1}^{m} u_j y_{js}}{\sum_{r=1}^{k} v_r x_{rs}} \leq 1 \quad s \neq i$.

If the DEA-score is below 1, other units in the analysis are more efficient. The units with the score 1 with the use of *i*'s weights are 'best practice' with regard to *i*.

This maximising process is repeated for all units. A number of units can therefore receive a DEA-score at 1.

Since Farrell (1957) others have worked on the method (see Cooper, Seiford, Tone, 2000 and Damm, 2001 for references). It is now possible to make functions with variable return to scale as well as DEA-scores over 1, called super-efficient scores (Andersen, P. and N.C. Petersen, 1993). These scores can rank units with initial DEA-scores at 1. This is illustrated in Figure 9, where the line from C to B is used as 'envelop'-line; in this case A is placed outside, the distance between A* (that represent the DEA-score at 1 at the new line) and A is representing the 'super efficiency'.

The recent use is closely connected to development of a number of software products as DEAWIN or EMS.

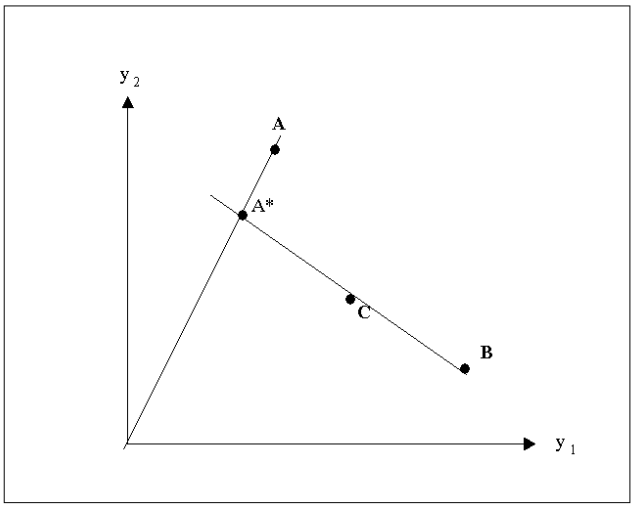


Figure 9

In some situations units can receive a DEA-score at 1 if some of the weights are 0, e.g., the weight 0 to all other outputs but the one, where the unit is ranked as number 1; then the whole idea of weighting the information is lost. As a consequence most DEA-analysis places restrictions on the weights: they are not allowed to be 0.

It is also possible to make restrictions in the calculation that reflects that articles in 'top'-journals should count more than other articles.

3.5.2 Ranking university department by a number of research outputs - a Danish example

Damm (2001) made an attempt to benchmark Danish departments within social science based on publications listed in university yearbooks and information on number of persons-years (full-time equivalent) in her MA-dissertation. Her work was later published as a report from The Danish Institute for Studies in Research and Research Policy. Because the publication lists in the yearbooks were structured differently she had to group the outlets from a pragmatic viewpoint ending with 13 types of outlets that she later grouped into 6 types of research outputs.

Her work was criticised from different viewpoints. Some criticised that she did not distinguish articles in top journals as Econometrica from other articles in refereed journals, i.e., used impact factors or other forms of information on the journals; others that she should have focused on a sub area of social science, e.g., economics The critic reflected the very different views on publication strategies, benchmarking and the level of information on methods as the DEA at the Danish departments.

As seen in Table 7 Department 4 is ranked as number 1 regardless of the method used. But it is also seen that the methods have a large influence on the ranking order of the other departments.

Department 17, 19 and 24 have a DEA-score at 1, i.e., the weights can be chosen so that they are 'the bests'. If the 'super-efficient method' is used they are ranked as 2, 3 and 4.

The ranking could be due to strategic choice or specific occurrence, i.e., if staff at a small unit is working on one large project, the first results might be working papers, the second results a report or book and then later a number of articles will occur.

Table 7 Ranking Danish university departments within economics, management and finance by number of articles in refereed journals, other sorts of articles, books and by the use of a six-level output in a DEA-analyse

Department No.	Ranking by number of refereed articles*	Ranked by number of other articles, WP, etc. **	Ranked by number of books***	Ranking by DEA with super efficiencies scores, constant return to scale, no zeroes allowed, and with 6 types of output ****
1	11	20	21	16
2	6	24	23	11
3	12	5	22	9
4	1	1	1	1
5	16	14	12	22
6	18	13	5	21
7	24	23	17	23
8	3	19	24	8
9	10	22	11	10
10	17	21	10	15
11	15	4	19	17
12	22	2	2	18
13	20	17	20	12
14	14	9	8	13
15	5	10	6	6
16	13	15	18	14
17	9	19	13	2(1)
18	19	8	16	24
19	4	3	14	3(1)
20	21	12	3	20
21	8	18	9	5
22	23	6	15	19
23	7	7	4	7
24	2	11	7	4(1)

* All refereed articles (regardless of language, Damm groups the articles into Nordic and not-Nordic).
** All other articles including articles in books and in papers, proceeding and presentations at conferences.
*** All kinds of books.
**** Source: Table 4.4.5.2 in Damm (2001).

4. Conclusive remarks -
suggested inputs and outputs in a Benchmarking project

As seen in Section 3 different methods a number of ways can been used to rank both journals and economic departments, and it will result in different rankings. This paper focuses on benchmarking, use of indicators of inputs and outputs to benchmarking processes, and ranking of journals with regard to benchmarking; the main purpose is therefore to suggest of ranking that can be used within a benchmarking project.

Several of the interviewed at Danish departments argued that the list of journals provided from *UC, Institute of Economics* (see appendix 2) did not fit their strategy and some pointed out that citations from important Working Papers should be included as output data. Among those were *Department of Economics at Copenhagen Business School*, which provided us with a list of journals and *Department of International Business at Aarhus School of Business* where the 'Wiener-ranking' has been used as inspiration.

Among the Danish research units that might join the benchmarking process is *Department of Economics and Natural Resources, Section of Economics at The Royal Veterinary and Agricultural University* (in Copenhagen), i.e., subdisciplines as Agricultural Economics must be taken into account. This unit provided us with a list of CORE-journals.
Therefore the suggestion is that journal articles are grouped into the following 3 groups:

I Articles:
   A. Top journals according to citations (3, 4 or 5 journals).
   B. Nearly top journals and top subdiscipline journals (up to 'top-30' + 2 from every subdiscipline).
   C. Other refereed journals including journals written in Nordic, Dutch, German, French and other languages.

Where the weights should reflect the difference, e.g.,
$\text{weight}_{\text{article type A}} > \text{weight}_{\text{article type B}} > \text{weight}_{\text{article type C}}$

And that other sorts of outlets included in the analysis are:

II Books
III Reports
IV Dissertations
V Working papers in series

And that the output list is supplemented by results from a citation analysis.

Most departments and research units have information on articles as well as other outlets written by faculty in databases, whish make it possible to count the number of articles in different categories simple by sorting the articles by journal and count other forms of outlets.

The different departments have different size measured by number of researchers and/or person years of research and they have different structures: some are research- and teaching units other are solely research units. All Danish departments submit data the R&D statistics, i.e., information on persons-years is accessible.[13]

A number of different forms of models can be used in a benchmarking project:

For departments that are research- and teaching units the model shown in Figure 6 might be the most relevant where it for other departments might be more relevant to use the model shown in Figure 7.

In both cases the DEA-method should be used.

[13] All OECD countries collect data on R&D-personnel, including number, gender, and person-years according to the Frascati-manual.

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Appendix 1. Table 1A from the study of Barrett, Olia and von Bailey

Journal	Subdiscipline Rank	Subdiscipline Index	Discipline* Rank	Discipline* Index
***JEL* Code C: Mathematical and Quantitative Methods**				
Econometrica	1	100.0	2	78.4
Journal of Economic Theory	2	81.0	9	34.9
Review of Economic Studies	3	70.1	6	40.7
American Economic Review	4	66.6	7	40.2
Journal of Political Economy	5	62.1	3	63.0
Journal of American Statistical Assn	6	54.6	25	8.0
Journal of Econometrics	7	40.6	16	18.6
International Economic Review	8	36.9	20	12.3
Biometrika	9	27.6	NR	
Annals of Statistics	10	7.6	NR	
***JEL* Code D: Microeconomics**				
Econometrica	1	100.0	2	78.4
American Economic Review	2	99.6	7	40.2
Journal of Political Economy	3	63.4	3	63.0
Review of Economic Studies	4	49.1	6	40.7
Journal of Economic Theory	5	45.5	9	34.9
Journal of Law and Economics	6	44.4	21	11.7
Quarterly Journal of Economics	7	39.8	5	41.6
Journal of Financial Economics	8	16.5	1	100.0
Economic Journal	9	16.1	28	7.5
Review of Economics and Statistics	10	12.9	29	6.5

Note: Journal of Economic Psychology dropped from list of citing journals to achieve convergent ranking.

***JEL* Code E: Macroeconomics and Monetary Economics**				
Journal of Political Economy	1	100.0	3	63.0
American Economic Review	2	82.8	7	40.2
Econometrica	3	54.1	2	78.4
Journal of Monetary Economics	4	27.3	4	41.9
Journal of Finance	5	24.8	10	34.1
Quarterly Journal of Economics	6	22.5	5	41.6
Journal of Money, Credit & Banking	7	18.0	22	9.0
Brookings Papers on Economic Activity	8	15.2	17	15.9
Journal of Economic Theory	9	15.0	9	34.9
Carnegie-Rochester Conf. Series on Public Policy	10	13.7	NR	

Journal	Subdiscipline Rank	Subdiscipline Index	Discipline* Rank	Discipline* Index
***JEL* Code F: International Economics**				
Journal of Political Economy	1	100.0	3	63.0
American Economic Review	2	88.4	7	40.2
Econometrica	3	41.1	2	78.4
Journal of Monetary Economics	4	34.7	4	41.9
Quarterly Journal of Economics	5	33.7	5	41.6
Economic Journal	6	25.7	28	7.5
Review of Economics Studies	7	24.1	6	40.7
International Economic Review	8	21.4	20	12.3
Journal of International Economics	9	20.6	27	7.6
Canadian Journal of Economics	10	18.0	62	0.8
***JEL* Code G: Financial Economics**				
Journal of Financial Economics	1	100.0	1	100.0
Journal of Finance	2	66.3	10	34.1
Journal of Futures Markets	3	39.2	NR	
Journal of Political Economy	4	35.5	3	63.0
Journal of Business	5	32.7	14	21.2
Econometrica	6	32.6	2	78.4
American Economic Review	7	32.4	7	40.2
Journal of Financial and Quantitative Analysis	8	22.8	19	14.3
Rand Journal of Economics	9	15.9	8	40.2
Journal of Economic Theory	10	10.1	9	34.9
***JEL* Code H: Public Economics**				
American Economic Review	1	100.0	7	40.2
Journal of Political Economy	2	79.0	3	63.0
Econometrica	3	45.5	2	78.4
Quarterly Journal of Economics	4	31.7	5	41.6
Review of Economic Studies	5	29.0	6	40.7
Journal of Public Economics	6	23.6	24	8.6
Rand Journal of Economics	7	21.7	8	40.2
Review of Economics and Statistics	8	20.1	29	6.5
Journal of Economic Theory	9	19.0	9	34.9
National Tax Journal	10	17.1	77	0.4

Journal	Subdiscipline Rank	Subdiscipline Index	Discipline* Rank	Discipline* Index
***JEL* Code I: Health, Education, and Welfare**				
American Economic Review	1	100.0	7	40.2
Journal of Political Economy	2	97.0	3	63.0
Econometrica	3	77.5	2	78.4
Review of Economics and Statistics	4	59.2	29	6.5
Population Studies	5	34.2	NR	
Industrial and Labor Relations Review	6	32.4	37	4.4
Demography	7	28.6	NR	
International Economic Review	8	22.9	20	12.3
Journal of Labor Economics	9	21.7	18	15.4
Journal of Econometrics	10	17.1	16	18.6
Note: Inquiry dropped from list of citing journals to achieve convergent ranking.				
***JEL* Code J: Labor and Demographic Economics**				
American Economic Review	1	100.0	7	40.2
Journal of Political Economy	2	77.0	3	63.0
Industrial and Labor Relations Review	3	64.4	37	4.4
Review of Economics and Statistics	4	48.3	29	6.5
Industrial Relations	5	47.1	69	0.6
Econometrica	6	37.9	2	78.4
Quarterly Journal of Economics	7	33.8	5	41.6
Journal of Human Resources	8	32.2	35	4.6
Monthly Labor Review	9	26.6	86	0.1
Journal of Labor Research	10	23.3	57	1.5
***JEL* Code K: Law and Economics**				
American Economic Review	1	100.0	7	40.2
Journal of Political Economy	2	80.1	3	63.0
Rand Journal of Economics	3	40.0	8	40.2
Journal of Public Economics	4	31.5	24	8.6
Journal of Law and Economics	5	30.8	21	11.7
Econometrica	6	26.5	2	78.4
Quarterly Journal of Economics	7	26.0	5	41.6
Review of Economics and Statistics	8	20.9	29	6.5
Journal of Financial Economics	9	20.4	1	100.0
American Political Science Review	10	19.9	NR	

Journal	Subdiscipline Rank	Subdiscipline Index	Discipline* Rank	Discipline* Index
***JEL* Code L: Industrial Organization**				
American Economic Review	1	100.0	7	40.2
Journal of Political Economy	2	70.1	3	63.0
Econometrica	3	61.5	2	78.4
Rand Journal of Economics	4	37.3	8	40.2
Quarterly Journal of Economics	5	34.2	5	41.6
Review of Economic Studies	6	29.8	6	40.7
Journal of Law and Economics	7	26.4	21	11.7
Journal of Financial Economics	8	26.1	1	100.0
Journal of Economic Theory	9	25.0	9	34.9
Review of Economics and Statistics	10	21.3	29	6.5
***JEL* Code M: Business Administration and Business Economics**				
American Economic Review	1	100.0	7	40.2
Econometrica	2	57.5	2	78.4
Journal of Political Economy	3	55.9	3	63.0
Rand Journal of Economics	4	34.8	8	40.2
Quarterly Journal of Economics	5	33.4	5	41.6
Review of Economic Studies	6	27.2	6	40.7
Journal of Economic Theory	7	22.7	9	34.9
Journal of Law and Economics	8	22.2	21	11.7
Economic Journal	9	20.4	28	7.5
Review of Economics and Statistics	10	17.7	29	6.5

Note: International Journal of Forecasting dropped from list of citing journals to achieve convergent ranking.

Journal	Subdiscipline Rank	Subdiscipline Index	Discipline* Rank	Discipline* Index
***JEL* Code N: Economic History**				
Journal of Economic History	1	100.0	42	3.0
American Economic Review	2	77.6	7	40.2
Explorations in Economic History	3	71.9	47	2.3
Economic History Review	4	71.1	90	0.1
Journal of Political Economy	5	62.6	3	63.0
Business History Review	6	43.4	94	0.1
Agricultural History Review	7	33.0	NR	
Economic Journal	8	26.4	28	7.5
Past Present	9	20.3	NR	
Quarterly Journal of Economics	10	18.6	5	41.6

Journal	Subdiscipline Rank	Subdiscipline Index	Discipline* Rank	Discipline* Index
***JEL* Code O: Economic Development, Technological Change, and Growth**				
American Economic Review	1	100.0	7	40.2
Journal of Political Economy	2	58.6	3	63.0
Economic Journal	3	46.8	28	7.5
Economic Development and Cultural Change	4	34.9	84	0.2
Journal of Development Economics	5	33.5	59	1.2
Econometrica	6	33.0	2	78.4
Review of Economics and Statistics	7	31.8	29	6.5
World Development	8	30.3	104	0.0
Quarterly Journal of Economics	9	26.3	5	41.6
American Journal of Agricultural Economics	10	26.1	67	0.7
***JEL* Code P: Economic Systems**				
American Economic Review	1	100.0	7	40.2
Econometrica	2	47.4	2	78.4
Review of Economic Studies	3	37.8	6	40.7
New Left Review	4	32.0	NR	
Economic Journal	5	28.5	28	7.5
Journal of Political Economy	6	24.4	3	63.0
Quarterly Journal of Economics	7	23.0	5	41.6
Rand Journal of Economics	8	21.7	8	40.2
Review of Economics and Statistics	9	20.3	29	6.5
Economica	10	16.9	45	2.6
***JEL* Code Q: Agricultural and Natural Resource Economics**				
American Economic Review	1	100.0	7	40.2
Econometrica	2	91.6	2	78.4
Journal of Political Economy	3	71.4	3	63.0
American Journal of Agricultural Economics	4	41.7	67	0.7
Review of Economics and Statistics	5	40.1	29	6.5
Journal of Econometrics	6	27.6	16	18.6
Review of Economic Studies	7	26.0	6	40.7
Quarterly Journal of Economics	8	24.5	5	41.6
Land Economics	9	21.7	87	0.1
International Economic Review	10	20.8	20	12.3

Note: Acta Oeconomica and Journal of Common Market Studies dropped from list of citing journals to achieve convergent ranking.

Journal	Subdiscipline Rank	Subdiscipline Index	Discipline* Rank	Discipline* Index
***JEL* Code R: Urban, Rural and Regional Economics**				
American Economic Review	1	100.0	7	40.2
Journal of Political Economy	2	74.7	3	63.0
Journal of Urban Economics	3	63.0	56	1.6
Econometrica	4	58.7	2	78.4
Review of Economics and Statistics	5	57.9	29	6.5
Journal of Regional Science	6	41.7	92	0.1
Journal of Public Economics	7	35.1	24	8.6
Environment and Planning	8	33.4	NR	
Regional Science and Urban Economics	9	31.8	82	0.2
Land Economics	10	30.5	87	0.1

*LP, Table 1 (raw figures), Table 2 (adjusted figures).
NR = not ranked.

Appendix 2. Journals within economics classified by Institute of Economics, University of Copenhagen

The list is made of a committee of researchers at the institute, that were asked to rank international refereed journals within economics into 3 groups. The basis of the list is provided by the ranking found in Table 2 in ”Rankings of Economic Journals and Institutions in Economics” from October 2001 that Kalaitzidakis, Mamuneas and Stengos made for European Economic Association. The committee decided, that the journals with an impact factor over 50 should form group A and that journals with an impact factor over 7 and up to 50 should form group B.

A.

American Economic Review
Econometrica
Journal of Political Economy
Quarterly Journal of Economics

B.

Economic Journal
Economics Letters
Economic Theory
Econometric Theory
European Economic Review
Games and Economic Behaviour
International Economic Review
Journal of Applied Econometrics
Journal of Business and Economic Statistics
Journal of Development Economics
Journal of Economic Literature
Journal of Econometrics
Journal of Economic Perspectives
Journal of Economic Theory
Journal of Economic Dynamics and Control
Journal of Economic History
Journal of Environmental Economics and Management
Journal of Financial Economics
Journal of Human Resources

Journal of International Economics
Journal of Labour Economics
Journal of Monetary Economics
Journal of Public Economics
Rand Journal of Economics
Review of Economic Studies
Review of Economics and Statistics
Scandinavian Journal of Economics
World Bank Economic Review

C.

All other international refereed journals within economics