



University Rankings Based on an Evaluation of Their Core of Human Capital at Present and Future Periods: the Case of Greek Departments of Economics

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1. Introduction

The use of rankings in Higher Education (HE) is an attractive but also controversial subject. They serve different purposes and address different audiences. Although not universally accepted, it is increasingly acknowledged that they are an important tool for students, parents, academics, potential employers and society in general. They are frequently criticized on the indicators employed, weighting and normalization methods applied. There are also several questions about the quality, impact and actual 'value' of the outputs and conclusions produced. Very often the indicators of academic rankings are based on what can be measured such as publications and citations and indicators that are less tangible such as educational quality are neglected [1]. The recent trend to university ranking approaches shifts away from the basic assessment methodologies and towards more subtle assessments using more criteria providing an overall better guidance to all interested parties as Butler [2] indicates.

Several types of university rankings exist, the majority of which examines the research indicator only. For example, Kalaitzidakis et al. [3] used publications in a core set of 10 economic journals from 1991 to 1996 to rank European economics institutions and countries. They used, for the period under examination, journals such as American Economic Review, Econometrica, Journal of Political Economy etc., trying to overcome the issue of journal quality. Their research demonstrated the three leading universities in Europe and the three top-ranked countries. The proposed criterion is convenient if the period of examination is short. If it is not, then the validity of this indicator is disputed.

Number of publications and/or the pages per publication is a factor that is of significance in evaluation methods. The challenge in this case is how the pages are counted since journals have different page sizes and naturally, quality. One way to overcome this problem is the conversion of all journal pages to equivalent units using the American Economic Review (AER) size of page as a standard to unify size. A usual method is the Laband-Piette approach. Coupé [4], who produced a ranking of economic departments on an international basis, proposed the use of impact factors (available for 273 journals) that derive after counting the number of citations for an article published in a journal. The measurement takes place one to two years after publication. Considering that citations require time to build up, this criterion is an asset for the old articles compared to recent ones. The present research supports the use of simple count of citations of individual articles and avoids any weighting of journals. In this respect a measure of the quality of the article is provided (while the impact factors provide a measure of the quality of the journal where an article is published).

Methods which use other indicators besides research such as educational quality, have also been developed to a lesser extent however (see for example [5], [6]). Irrespective of the indicators employed, in all cases, departments are being evaluated on the performance of academic members as a total, irrespective of their position. In the following a methodology that examines the contribution of each position of academic members of staff in different time periods is proposed. The present research provides contributions for the literature since ranking the indicator of different positions in different time periods, has hardly been exploited in any published research.

2. A conceptual model for ranking universities

Giannias and Sfakianaki [7] presented a conceptual model for the ranking of the departments of economics in Greece. The evaluation of departments was based on the research output and quality records of all academic members of each department who have tenure or are on a tenure track. In the present study, the basic research hypothesis is still the same, i.e. the research employs research output and quality, however, in the current study the assessment of the Greek departments is implemented separately for each position of academic staff for four periods of time demonstrating the short and long term impact of each position in the overall assessment. The ranking is developed on the basis of results derived from the EconLit and Social Science Citation Index (SSCI) for publications over the period 1969-2004 and the citations they received since their publication respectively. The indicators employed for the development of the research is the number of EconLit publications (P) irrespective of the journal of publication, its impact factor, and the number of pages; and the number of citations per publication (C) without assigning any impact factors.

For each department of economics in Greece and for each position of academic staff, PA, we compute its mean research output $P(PA)$ and its mean quality of EconLit publications $C(PA)$, where:



$$P(PA) = \frac{\sum_1^n p_i(PA)}{n} \quad \text{Equation (1)}$$

$$C(PA) = \frac{\sum_1^n c_i(PA)}{n} \quad \text{Equation (2)}$$

$i = 1, \dots, n$ refers to the full-time academic members of staff of position PA of a department
 PA refers to the academic position; $PA = PR$ (Professor), AP (Associate Professor), AsP (Assistant Professor) and L (Lecturer), Professors and Associate Professors have tenure whereas Assistant Professors and Lecturers are on a tenure track.

$p_i(PA)$ is the number of publications of faculty member i of position PA ,

$c_i(PA)$ is the number of citations that the publications of author i of position PA have received.

All values are mapped in to a 0 – 100 scale; where, 100 is mapped to the best value of a variable, and 0 to the worse as shown in Equation 3:

$$X^* = \frac{(X - X_{min})}{(X_{max} - X_{min})} * 100 \quad \text{Equation (3)}$$

where, $X = P(PA), C(PA)$

We also introduce a composite index, $CI(PA)$, for each position, PA , which combines the weighted mean of $P(PA)$ and $C(PA)$ values for each department using the w_p and w_c weights respectively. These are obtained from an experts' opinion survey and are the following:

$$w_p = 0.60 \text{ and } w_c = 0.40$$

Subsequently, the following Composite Index, $CI^*(PA)$, is computed for each department of economics, where:

$$CI^*(PA) = w_p \times P^*(PA) + w_c \times C^*(PA) \quad \text{Equation (4)}$$

In terms of time (t), four periods are considered dividing time in current and long term periods. First we examine the Short Run period (SR); we may think of it as being the current situation ("today"). Long Run period One (LR1) follows which is defined as the period in which the Professors of period SR have been retired and the remaining academic staff holding a position in period SR have been advanced to the next rank; that is, an Associate Professor in period SR has been promoted to Professor in period LR1, an Assistant Professor in period SR has been promoted to Associate Professor in period LR1, and a Lecturer in period SR has been promoted to an Assistant Professor in period LR1. Long Run period Two (LR2) is the next period and in this case the remaining academic staff holding a position in period LR1 have been advanced to the next rank and similarly the Long Run period Three (LR3) is the final period in which the Professors, the Associate Professors, and the Assistant Professors of period SR have been retired and the remaining academic staff holding a position in period SR have been advanced to the third higher rank.

Given (4) and taking the weighted mean of the $CI^*(PA)$ for a department of economics, we obtain its Overall performance Composite Index, OCI^* , according to our criteria as illustrated in equation (5),

$$OCI^* = \sum_{PA} X(PA) \times CI^*(PA) \quad \text{Equation (5)}$$

where $X(PA)$ is the number of academic staff of position PA in period t , as a percentage of the total number of academic staff of the same period t where $t = SR, LR1, LR2, LR3$. The applicability of the conceptual model was tested for the nine departments of economics in Greece. These are the departments of economics of: Athens University of Economics and Business, University of Crete, National and Capodistrian University of Athens, University of Macedonia, University of Thessaly, University of Patras, University of Piraeus, University of Ioannina, Aristotle University of Thessaloniki. Next, the performance of each department in periods SR, LR1, LR2, and LR3 is evaluated.

3. Short and long run rankings based on an evaluation of the Core of Human Capital of each Greek department of economics

Greek departments are evaluated at various periods (present and future) using the CI of Equation 5, considering only those academic members who belonged to the department in period SR. It has been assumed therefore that the Core of the Human Capital (CHC) of a department in subsequent periods consists of members who were in the department in period SR. The basic assumptions of the present analysis are the following:

- The CHC in period SR, CHC(SR), consists of the PR, AP, AsP, and L of period SR.
- The CHC in period LR1, CHC(LR1), consists of the PR, AP, AsP, of period LR1 who were (presumably) AP, AsP, and L in period SR.
- The CHC in period LR2, CHC(LR2), consists of the PR, AP of period LR2 who were (presumably) AP, AsP in period LR1 and AsP, and L in period SR, and
- The CHC in period LR3, CHC(LR3), consists of the PR of period LR3 who were (presumably) AP in period LR2, AsP in period LR1, and L in period SR.

Table 1 presents the OCI* values for the Core of Human Capital of the nine Greek departments of economics for the four periods of time under consideration. These values were obtained after applying Equations 1-5.

OCI* values for CHC								
Department of Economics	SR		LR1		LR2		LR3	
	OCI*	R	OCI*	R	OCI*	R	OCI*	R
Athens University of Economics and Business	89	1	72	1	70	1	76	2
University of Crete	55	2	45	4	36	6	17	6
National and Capodistrian University of Athens	53	3	49	3	42	4	43	4
University of Patras	47	4	56	2	59	2	79	1
University of Macedonia	39	5	39	5	48	3	26	5
University of Ioannina	36	6	36	6	38	5	57	3
University of Thessaly	22	7	16	8	7	8	0	8
University of Piraeus	19	8	29	7	24	7	0	8
Aristotle University of Thessaloniki	6	9	4	9	5	9	11	7

Table 1: OCI* values for CHC for the four periods (SR, LR1, LR2, LR3) and comparison of ranking between SR and LR3

For each period, universities are ranked (R) from higher to lower values and a comparison between the SR and LR3 was undertaken; in the case that the department falls into a lower position then it is marked red whereas in the case that it moves to a higher position it is marked green. Finally, when the rank remains the same, there is no colour marking. Ceteris paribus, the higher the position of a department, the higher is the contribution of today's members of staff (period SR) in the future position of the department in the relevant rankings (periods LR1, LR2, LR3). Ceteris paribus, the lower the position of a department on the ranking is, the greater the needs to attract the relative best candidates for the open positions through recruiting.

4. Conclusions

The methodology developed focuses on research as a basis for comparison using data published in international databases by extending previous work of the authors. The present paper examines an indicator that has hardly been investigated, that of the Core of the Human Capital of departments. It demonstrates how the different positions of academic members of staff can contribute in the research evaluation of their institute at different time periods. The methodology proposed takes into consideration the contribution in terms of mean number of publications (P) and citations (C) listed in EconLit for the different positions of academic members of staff and ranks institutes.

The present research examined the scenario where the CHC of a department in subsequent periods consists of members who were in the department at period SR. Clearly there are many more combinations that can be investigated. The results demonstrated that the Athens University of Economics and Business is constantly first in rankings with the exception of the last period (LR3). Some universities improve although at low position at present (SR) and others do not manage to maintain their position in time and drop in ranking. The methodology provides a tool, besides the actual ranking, for benchmarking, monitoring and future improvement.



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