Ranking socio-demographic journals

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Abstract
The purpose of this paper is to rank economic journals in the broader field of sociology and demography. By using one composite input and one composite output the paper ranks 40 journals in a linear programming setting using data for the time period of 1996-2010. In addition for the first time three different quality ranking reports have been incorporated into a Data Envelopment Analysis (DEA) modelling problem in order to classify these journals into four categories (‘A’ to ‘D’).

Keywords: Ranking; Economic journals; Sociology; Demography.

JEL classification codes: A10; C02; J10 ; Z10

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1. Introduction

The ranking of academic journals has been in the research agenda for several years. In Economics the ranking of the journals has always been associated with scientific quality (Ritzberger 2008). According to Pujol (2008) citation analysis and peer review are the main approaches when ranking journals. The most recognisable ranking list in Economics has been introduced by Diamond (1989). Diamond has used data from Social Science Citation Index and has created a list of 27 economic journals known as “Diamond’s core economic journals”.

However, even though the list was questioned due to its arbitrary use of weights several authors have confirmed its validity (Burton and Phimister 1995; Halkos and Tzeremes 2011). Liebowitz and Palmer (1984) have applied a Linear Programming (LP)-method to overcome problems of arbitrary weights when ranking the journals. Nearly ten years after, Laband and Piette (1994) presented an updated ranking based on the paper of Liebowitz and Palmer (1984). A LP-method is also used by Kalaitzidakis, Mamuneas and Stengos (2003) in order to construct a global ranking of universities. Kalaitzidakis, Mamuneas and Stengos (2010, 2011) applied the same updated methodology in order to provide a smoother longer view and to avoid randomness in order to rank economics journals (heterodox and mainstream).

However, throughout the years several authors (Lee and Harley 1998; Lee 2007; Lee and Elsner 2008; Lee et al. 2010) suggested that when ranking Economics journals heterogeneities and heterodoxies related with different economic fields in which the journals are focusing their scientific quality must be captured\(^1\). More recently Halkos and Tzeremes (2011) evaluated 229 economic journals in a Data Envelopment Analysis (DEA) context. In order to overcome the problem of bias when evaluating journals from different economic field, they used composite inputs

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\(^1\) In addition for heterodox economic journals see also the works of Earl (2008), Cronin (2008), Corsi et al. (2010), Kapeller (2010) and Starr (2010).
and outputs taking into account quality rankings reports. Then in a DEA context and by applying bootstrap techniques for controlling for sample bias they derived the ranking of these 229 heterodox and mainstream Economics journals.

It has to be mentioned that the inclusion of bootstrap techniques and quality reports in a DEA setting minimizes the problem of comparing heterodox economic journals but doesn’t eliminate it. Here an alternative way of ranking economic journals in a DEA context is provided by comparing 40 economic journals in the field of sociology and demography. In addition both quantitative and qualitative data are used in an activity analysis framework producing in such a way a unified ranking approach.

2. Data and Methodology

2.1 Data description

A basic requirement of our sample is the inclusion of journals in the EconLit database\(^2\) (therefore they can be recognised as journals in the field of Economics). In addition and in order to obtain bibliographic data the journals must be included in Scopus database\(^3\) and/or Social Science Citation Index (SSCI)\(^4\). In order to create a quality index of the Journals under evaluation three different quality ranking reports have been used. First Kiel internal ranking report\(^5\) published from the Kiel Institute for the World Economy has been used. Kiel internal ranking report is based upon the seminar work by Kodrzycki and Yu (2006). In addition the quality ranking report

\(^2\) The EconLit database can be accessed at: http://www.aeaweb.org/econlit/journal_list.php.
\(^3\) The bibliographic data from SCOPUS database can be retrieved from: http://www.scopus.com/home.url.
\(^4\) Data from Social Science Citation Index can be retrieved from: http://thomsonreuters.com/products_services/science/science_products/a-z/social_sciences_citation_index.
\(^5\) KIEL internal rankings for 2010 can be downloaded from: http://www.ifw-kiel.de/forschung/internal-journal-ranking.
According to Harvey et al. (2010) the ABS Academic Journal Quality Guide is a hybrid approach based on experts’ opinion and on citation analysis specialized mostly in business and management journals. Finally, data from a third quality report has been used derived from the Australian Business Deans Council (ABDC-‘Journal Quality List’). The ABDC list is the longest of all containing ranking classifications of 2671 journals from a variety of different disciplines. The data used in our study are concerning the recorded data of forty journals as of the end of the year 2010.

Following Halkos and Tzeremes (2011) our study uses an LP formulation in a production activity framework in order to rank the journals \( j \) by using one composite input and one composite output. The input \( x_j \) has been constructed as:

\[
x_j = \frac{NI_j}{NV_j}
\]

(1)

where \( NI_j \) represents the number of journals’ issues (from 1996 to 2010) and \( NV_j \) represents the number of journals’ volumes (until 2010). The proposed composite input has the ability to control for the age and the size of the journal under evaluation.

In addition the composite output \( y_j \) has been constructed as:

\[
y_j = \frac{NC_j}{NP_j / Q_j}
\]

(2)

where \( NC_j \) represents the number of journals’ citations (from 1996 to 2010) excluded self citations; \( NP_j \) represents the number of papers’ cited (from 1996 to

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and $Q_j$ is a quality index controlling the qualitative aspects among the examined sample in a relative way. Therefore, the relative quality index $Q_j$ is an additional composite index which is based on the three quality ranking reports $i$ (Kiel, ABS and ABDC) and has the form of:

$$Q_j = \prod_{i=1}^{3} \frac{AR_i}{\sum_j AR_j}$$

(3)

where $AR$ represents the adjusted ranking reports’ score from Kiel, ABS and ABDC.

In Kiel report the journals take the values from “A” (high quality journal) to “D” (lower quality journal). In addition we construct the adjusted ranking based on Kiel report - ‘$AR(KIEL)$’ by assigning the value of 5 to “A” class, the value of 4 to “B” class, the value of 3 to “C” class, the value of 2 to “D” class and the value of 1 to journals which are not listed in the report. Similarly, for the adjusted ranking report for the ABS - ‘$AR(ABS)$’, we assign six values for journals’ quality. In our case the highest quality in a journal (A*) is assigned with 6 whereas the lowest quality with 1 (i.e. the journal is not listed in the report). Additionally for the adjusted ABDC ranking - ‘$AR(ABDC)$’ we assign five values. We assign the value of 5 to “A*”, 4 to “A”, 3 to “B”, 2 to “C” and 1 to the journals which are not listed in the report. In contrast with the KIEL quality assessment the ABS and ABDC reports “grasp” the quality of the journals within their subject area (i.e. Accounting and Auditing, Finance, Business, etc.).

Halkos and Tzeremes (2011) have used two quality reports in the context of DEA for ranking economic journals alongside with bootstrap techniques in order to grasp the heterogeneities of different economic fields among the examined journals.

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8 The ABS quality ranking originally contains five scales (A*, A, B, C and D) with ‘A*’ representing the highest quality and ‘D’ the lowest.

9 The ABDC quality ranking originally contains four scales (A*, A, B and C) with ‘A*’ representing the highest quality and ‘C’ the lowest.
In the same lines (but with different LP modelling), we use three different quality reports along side with citation data in order to capture the relative quality of the number of papers being cited.

Table 1 provides descriptive statistics of the variables used alongside with descriptive statistics of the composite input and output. As can be realised (looking at the standard deviation values) a lot of heterogeneities among the journals in terms of the number of issues and volumes are being reported. In addition high heterogeneities are being reported in the number of citations and in the number of the cited articles. This is a first indication of the differences of the ‘popularity’ and/or the ‘quality’ of the journals under examination. This is also confirmed when looking at the descriptive statistics of the three adaptive ranking reports (AR).

Finally, as in Burton and Phimister (1995) we apply DEA methodology using the composite input and output in order to rank the journals and thus avoiding the problem of assigning arbitrary weights to the journals.

Table 1: Descriptive statistics of the variables

<table>
<thead>
<tr>
<th></th>
<th>NC</th>
<th>NP</th>
<th>NV</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>5350.675</td>
<td>555.1</td>
<td>48.475</td>
<td>63.975</td>
</tr>
<tr>
<td>SD</td>
<td>6817.66867</td>
<td>357.67722</td>
<td>29.56348</td>
<td>32.231922</td>
</tr>
<tr>
<td>Min</td>
<td>28</td>
<td>45</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>Max</td>
<td>30066</td>
<td>1636</td>
<td>121</td>
<td>181</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AR(ABS)</th>
<th>AR(ABDC)</th>
<th>AR (KIEL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1.65</td>
<td>3</td>
</tr>
<tr>
<td>SD</td>
<td>1.271986131</td>
<td>1.086041979</td>
</tr>
<tr>
<td>Min</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Max</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Composite Input</th>
<th>Composite Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1.944643098</td>
</tr>
<tr>
<td>SD</td>
<td>1.440190025</td>
</tr>
<tr>
<td>Min</td>
<td>0.435643564</td>
</tr>
<tr>
<td>Max</td>
<td>6</td>
</tr>
</tbody>
</table>
2.2 The economic model

Let us have a set of points $\Psi$ (the production set) given $p$ inputs and $q$ outputs can be defined in the Euclidean space $\mathbb{R}_+^{p+q}$ as:

$$
\Psi = \{(x,y) | x \in \mathbb{R}_+^p, y \in \mathbb{R}_+^q, (x,y) \text{ is feasible}\}
$$

where $x$ is the input vector and $y$ is the output vector. In addition the output correspondence set (for all $x \in \Psi$) can be defined as:

$$
P(x) = \{ y \in \mathbb{R}_+^q | (x,y) \in \Psi \}
$$

Furthermore $P(x)$ consists of all output vectors that can be produced by a given input vector $x \in \mathbb{R}_+^p$. Following Farrell (1957) the efficient boundaries or isoquants of the sections of $\Psi$ can be defined in radial terms (for output space) as:

$$
\partial P(x) = \{ y \in P(x), \lambda y \notin P(x), \forall \lambda > 1 \}
$$

In addition following Shephard (1970) several economic axioms can be stated:

1. *No free lunch.* i.e. $(x,y) \notin \Psi$ if $x = 0, y \geq 0, y \neq 0$.

2. *Free disposability.* i.e. Let $\tilde{x} \in \mathbb{R}_+^p$ and $\tilde{y} \in \mathbb{R}_+^q$, with $\tilde{x} \geq x$ and $\tilde{y} \leq y$ if $(x,y) \in \Psi$ then $\left(\tilde{x},\tilde{y}\right) \in \Psi$ and $\left(x,y\right) \in \Psi$.

3. *Bounded.* $P(x)$ is bounded $\forall x \in \mathbb{R}_+^p$.

4. *Closeness.* $\Psi$ is closed.

5. *Convexity.* $\Psi$ is convex.

Moreover, the DEA estimator of the production set can be obtained following the linear programming by Charnes, Cooper and Rhodes (1978) who model constant

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\textsuperscript{10} We follow the presentation by Daraio and Simar (2007).
returns to scale (CRS) and popularized the technique\textsuperscript{11}. Therefore, the measurement of the efficiency of a given journal can be estimated as:

\[
\hat{\Psi}_{DEA} = \left\{ (x, y) \in R^{p+q}_+ \mid y \leq \sum_{i=1}^{n} \gamma_i Y_i; x \geq \sum_{i=1}^{n} \gamma_i X_i, \text{ for } (\gamma_1, \ldots, \gamma_n); \gamma_i \geq 0, i = 1, \ldots, n \right\}
\]

Then the estimator of the output efficiency score for a given \((x_0, y_0)\) measure can be obtained by solving the following linear programming:

\[
\hat{\lambda}_{DEA}(x_0, y_0) = \sup \left\{ \lambda \mid (x_0, \lambda y_0) \in \hat{\Psi}_{DEA} \right\}
\]

\[
\hat{\lambda}_{DEA}(x_0, y_0) = \max \left\{ \lambda \mid \lambda y_0 \leq \sum_{i=1}^{n} \gamma_i Y_i; x_0 \geq \sum_{i=1}^{n} \gamma_i X_i; \lambda > 0; \gamma_i \geq 0, i = 1, \ldots, n \right\}
\]

As can be seen our paper uses an output orientation\textsuperscript{12} under constant returns to scale assumption. Since the size of the journals has been captured from the composite input the assumption of CRS is the most appropriate for our case.

3. Empirical Results

Table 2 presents the results from the efficiency analysis. Journals’ efficiency levels can take the values between 0 and 1 (efficient journal). The mean efficiency scores (0.055) and the standard deviation (0.161) indicate that there are extremely significant differences among the journals. The Journal of Consumer Research appears to be efficient whereas the rest of them inefficient (in terms of DEA methodology).

\textsuperscript{11} For the history and the roots of DEA see Førsund and Sarafoglou (2002).

\textsuperscript{12} The output orientation in our case indicates that the journals try to maximise their output (i.e. citations) given their input quantities (i.e. volumes, issues). In addition this specification can be said is more suitable for our case because it allow us to capture further quality aspects of the examined journals.
Since we face a lot of variations among the efficiency scores obtained we follow Halkos and Tzeremes (2011) by distinguishing the journals into four categories based on their ranking order instead of their obtained efficiency score. Therefore, journals’ efficiency scores are used only for ranking order purposes rather than an absolute measure of journals scientific quality.

In our case there are four categories (i.e. ‘A’ to ‘D’){13} and therefore it will be able to make our results comparable with most of the quality rankings. As such we split our sample into four parts. The first part is the first 10% of the sample (i.e. the 10% of the journals with the highest ranking) and indicates category ‘A’. In addition the next 20% indicates category ‘B’, the next 30% category ‘C’ and the final 40% indicates category ‘D’.

Looking at table 2 we realize that under category ‘A’ have been assigned four journals. These are *Journal of Consumer Research, Demography, Economy and Society* and *Population & Development Review*.


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{13} As in many quality reports ‘A’ indicates the highest quality whereas ‘D’ the lowest.

4. Conclusions

Our study applies a basic output oriented DEA model under the assumption of constant returns to scale in order to evaluate economic journals in the field of sociology and demography by using a combination of quantitative and qualitative data. The quantitative data are concerning journals’ number of citations, issues, volumes and cited papers from two international databases. In addition the qualitative data are derived from three well-known qualitative ranking reports (ABS, ABDC, Kiel). Then the paper constructs one composite input and one composite output based on the above data in a DEA related framework.

Finally, with the proposed approach the traditional ranking related problems regarding the heterogeneity, the inclusion of arbitrary weights and the combination both of qualitative and quantitative data are been overcame. At the end by applying relative classification to the journals’ rankings, four main categories have been created, categorizing in such a way for the first time economic journals in the field of sociology and demography into four main quality classes.
Table 2: Ranking of socio-demographic journals

<table>
<thead>
<tr>
<th>Rank</th>
<th>Journals</th>
<th>Score</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Journal of Consumer Research</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>Demography</td>
<td>0.26381</td>
<td>A</td>
</tr>
<tr>
<td>3</td>
<td>Economy and Society</td>
<td>0.12497</td>
<td>A</td>
</tr>
<tr>
<td>4</td>
<td>Population &amp; Development Review</td>
<td>0.12141</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>Population Studies-A Journal of Demography</td>
<td>0.10600</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>Journal of Population Economics</td>
<td>0.09362</td>
<td>B</td>
</tr>
<tr>
<td>7</td>
<td>Journal of Economic Psychology</td>
<td>0.06447</td>
<td>B</td>
</tr>
<tr>
<td>8</td>
<td>Kyklos</td>
<td>0.06350</td>
<td>B</td>
</tr>
<tr>
<td>9</td>
<td>Social Choice &amp; Welfare</td>
<td>0.05342</td>
<td>B</td>
</tr>
<tr>
<td>10</td>
<td>Nonprofit &amp; Voluntary Sector Quarterly</td>
<td>0.03896</td>
<td>B</td>
</tr>
<tr>
<td>11</td>
<td>American Journal of Economics &amp; Sociology</td>
<td>0.03835</td>
<td>B</td>
</tr>
<tr>
<td>12</td>
<td>Review of Social Economy</td>
<td>0.03602</td>
<td>B</td>
</tr>
<tr>
<td>13</td>
<td>Social Science Quarterly</td>
<td>0.03346</td>
<td>C</td>
</tr>
<tr>
<td>14</td>
<td>Studies in Family Planning</td>
<td>0.03040</td>
<td>C</td>
</tr>
<tr>
<td>15</td>
<td>Social Service Review</td>
<td>0.02114</td>
<td>C</td>
</tr>
<tr>
<td>16</td>
<td>Annals of the American Academy of Political &amp; Social Science</td>
<td>0.01775</td>
<td>C</td>
</tr>
<tr>
<td>17</td>
<td>Mathematical Social Sciences</td>
<td>0.01670</td>
<td>C</td>
</tr>
<tr>
<td>18</td>
<td>International Social Science Journal</td>
<td>0.01427</td>
<td>C</td>
</tr>
<tr>
<td>19</td>
<td>Population Research &amp; Policy Review</td>
<td>0.01072</td>
<td>C</td>
</tr>
<tr>
<td>20</td>
<td>Social Research: An International Quarterly</td>
<td>0.01056</td>
<td>C</td>
</tr>
<tr>
<td>21</td>
<td>Economic &amp; Social Review</td>
<td>0.00935</td>
<td>C</td>
</tr>
<tr>
<td>22</td>
<td>Population</td>
<td>0.00932</td>
<td>C</td>
</tr>
<tr>
<td>23</td>
<td>European Journal of Population-Revue Europeenne de Demographie</td>
<td>0.00748</td>
<td>C</td>
</tr>
<tr>
<td>24</td>
<td>Population Bulletin</td>
<td>0.00647</td>
<td>C</td>
</tr>
<tr>
<td>25</td>
<td>Economics &amp; Human Biology</td>
<td>0.00560</td>
<td>D</td>
</tr>
<tr>
<td>26</td>
<td>Global Networks: A journal of transnational affairs</td>
<td>0.00527</td>
<td>D</td>
</tr>
<tr>
<td>27</td>
<td>Journal of Asian Studies</td>
<td>0.00525</td>
<td>D</td>
</tr>
<tr>
<td>28</td>
<td>Social Security Bulletin</td>
<td>0.00452</td>
<td>D</td>
</tr>
<tr>
<td>29</td>
<td>Social Indicators Research</td>
<td>0.00263</td>
<td>D</td>
</tr>
<tr>
<td>30</td>
<td>Journal of Happiness Studies</td>
<td>0.00257</td>
<td>D</td>
</tr>
<tr>
<td>31</td>
<td>Social &amp; Economic Studies</td>
<td>0.00250</td>
<td>D</td>
</tr>
<tr>
<td>32</td>
<td>Science &amp; Society</td>
<td>0.00187</td>
<td>D</td>
</tr>
<tr>
<td>33</td>
<td>International Journal of Social Economics</td>
<td>0.00136</td>
<td>D</td>
</tr>
<tr>
<td>34</td>
<td>Forum for Social Economics</td>
<td>0.00113</td>
<td>D</td>
</tr>
<tr>
<td>35</td>
<td>Social Science Japan Journal</td>
<td>0.00067</td>
<td>D</td>
</tr>
<tr>
<td>36</td>
<td>Global Social Policy</td>
<td>0.00061</td>
<td>D</td>
</tr>
<tr>
<td>37</td>
<td>CEPAL Review</td>
<td>0.00050</td>
<td>D</td>
</tr>
<tr>
<td>38</td>
<td>Indian Journal of Gender Studies</td>
<td>0.00040</td>
<td>D</td>
</tr>
<tr>
<td>39</td>
<td>Asia Europe Journal</td>
<td>0.00017</td>
<td>D</td>
</tr>
<tr>
<td>40</td>
<td>Journal of the Social Sciences</td>
<td>0.00004</td>
<td>D</td>
</tr>
</tbody>
</table>

mean: 0.05568
std: 0.16134
min: 0.00004
max: 1
References


