Support Programs to Increase the Number of Scientific Publications Using Bibliometric Measures: The Turkish Case

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Plan

• Use of bibliometric measures in research evaluation (JIF, h-index, Article Influence Score)
• TUBITAK’s Support Program of International Scholarly Publications
• Method
• Findings
• Discussion and conclusions
Turkey in Brief

• 185 universities
• Over 5M students
• 151K faculty
• 7K academic book titles published p.a.
• Close to 1,700 academic journals published
• About 400K papers in total in WoS-indexed journals

<table>
<thead>
<tr>
<th>Year</th>
<th># of papers</th>
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<tbody>
<tr>
<td>1990</td>
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<td>1995</td>
<td>3423</td>
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<tr>
<td>1996</td>
<td>4408</td>
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<td>2008</td>
<td>25128</td>
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<td>2009</td>
<td>28525</td>
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<td>2010</td>
<td>29480</td>
</tr>
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<td>2011</td>
<td>30425</td>
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<td>2013</td>
<td>35717</td>
</tr>
<tr>
<td>2014</td>
<td>34231</td>
</tr>
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</table>

Source: [http://webofscience.com](http://webofscience.com), 26 April 2015
Research evaluation

• Peer review
• Academic tenure and performance
• Research and publication support
  – E.g., Research Excellence Framework (REF)
  – Publication support (e.g., TUBITAK, universities)
Impact-factor obsession

Soaring interest in one crude measure — the average citation counts of items published in a journal in the past two years — illustrates the crisis in research evaluation.

1. ARTICLES MENTIONING ‘IMPACT FACTOR’ IN TITLE

DORA declaration calls for a halt on the equating of journal impact factor with research quality.

Special issue of Scientometrics journal on impact factors.

2. WHO IS MOST OBSESSED?

Bibliometric journals add a large number of research articles to social sciences.

*Indexed in the Web of Science. (DORA, San Francisco Declaration on Research Assessment.)

Source: Hicks et al., 2015, p. 431
Journal Impact Factor (JIF)

• Citation indexes
• Web of Science (WoS)
• Journal Citation Reports (JCR)
• Journal Impact Factor
  – Developed to help librarians in collection development
  – Average number of citations to papers published in a journal (# of citations / # of citable items)
Drawbacks of citation-based metrics

• Skewed citation distributions
  – 43% of 11,500 journals listed in JCR 2012 have JIF’s between 0 and 1

• Different publication and citation practices in different disciplines
  – Top Economics paper received 60 citations whereas top Science paper received more than 1,000 citations between 2008-2012 (hence JIFs vary)

• Changing publishers policies
  – Web of Science indexed c. 8,000 journals in 2006 and 11,500 in 2012

• “Gaming” and manipulation

• “Bean counting”

• Do not to use “journal-based metrics . . . as a surrogate measure of the quality . . .” (San Francisco, 2012)

• But . . . the Higher Education Council and TUBITAK are using it

Sources: Kaynak: Al ve Soydal, 2014; Casadevall ve Fang, 2014; Hicks, 2015; Seglen, 1997; Sgroi ve Oswald, 2013, s. F256; Tonta, 2014a, 2014b, 2015; LSE, 2011, s. 26; SCImago, 2015, http://www.scimagojr.com
TUBITAK’s Support Program of Int’l Scholarly Papers

• 1993-2012: based on JIFs taken from JCR
  – Journals classified as A, B, C and D based on their JIFs
• 2013: based on JIF5 and cited half-life (which has more to do with the obsolescence of the paper than its quality)
• 2014: based on Article Influence Score (AIS), which measures the average impact of a paper (similar to Google’s PageRank algorithm) and is highly correlated with JIF

TUBITAK’s Support Program of Int’l Scholarly Papers

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount of Support (MTL)</th>
<th># of Papers</th>
<th># of Researchers</th>
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<tbody>
<tr>
<td>2011</td>
<td>8.01</td>
<td>11,342</td>
<td>11,721</td>
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<tr>
<td>2012</td>
<td>8.15</td>
<td>11,780</td>
<td>12,053</td>
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<tr>
<td>2013</td>
<td>10.06</td>
<td>10,653</td>
<td>11,199</td>
</tr>
<tr>
<td>2014</td>
<td>11.5</td>
<td>11,530</td>
<td>12,449</td>
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</table>

Purpose

• To examine the impact of TUBITAK’s most recent algorithmic changes (2013-2014) and compare them with that of pre-2012
• To understand the motives behind changes and their effects on journal scores determining the amount of TUBITAK’s monetary support
Method

• Stratified sample
  – from TUBITAK’s list of 2012 journals (N=11,562)
  – Strata: journals grouped under A (36%), B (21%), C (41%), and D (2%)
  – One third were Social Science journals

• Sample size: 2% (n=232)
## Population parameters & sample statistics

<table>
<thead>
<tr>
<th>Group</th>
<th>Population parameters</th>
<th>Sample statistics</th>
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<tbody>
<tr>
<td></td>
<td>Science</td>
<td>Social Science</td>
</tr>
<tr>
<td>A</td>
<td>2037</td>
<td>48</td>
</tr>
<tr>
<td>B</td>
<td>1824</td>
<td>75</td>
</tr>
<tr>
<td>C</td>
<td>3763</td>
<td>80</td>
</tr>
<tr>
<td>D</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Total</td>
<td>7624</td>
<td>100</td>
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</table>
Findings
Amount of support (in Turkish Lira)

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>Increase 2013-2014 (%)</th>
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<tbody>
<tr>
<td>Mean</td>
<td>1176</td>
<td>1317</td>
<td>1403</td>
<td>7</td>
</tr>
<tr>
<td>Minimum</td>
<td>433</td>
<td>500</td>
<td>500</td>
<td>0</td>
</tr>
<tr>
<td>1st quartile</td>
<td>433</td>
<td>533</td>
<td>558</td>
<td>5</td>
</tr>
<tr>
<td>Median</td>
<td>867</td>
<td>829</td>
<td>874</td>
<td>5</td>
</tr>
<tr>
<td>3rd quartile</td>
<td>1408</td>
<td>1518</td>
<td>1806</td>
<td>19</td>
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<tr>
<td>Maximum</td>
<td>2600</td>
<td>5000</td>
<td>5000</td>
<td>0</td>
</tr>
</tbody>
</table>
Scatter of journals by amount of TUBITAK support (2012-2014)

Pearson’s r’s
- 2012-2013 $r = 0.29$
- 2012-2014 $r = 0.23$
- 2013-2014 $r = 0.77$
Correlations

• Group A journals of 2012 received less support in 2013 and 2014.

• Out of 84 A journals in 2012, only 15 (18%) maintained their top positions in 2013 and 2014 (12 Science and 3 Social Science journals).

• No discernible patterns between the amount of support in 2012 and the succeeding years:
  – 2012-2013 $r = 0.29$ ($p = .000$)
  – 2012-2014 $r = 0.23$ ($p = .000$)

• Moderate correlation between 2013 and 2014:
  – 2013-2014 $r = 0.77$ ($p = .000$)
Comparison of 2013 and 2014 journals

\[ r = 0.77 \]
Relationship between journal score and the amount of support in 2013
Relationship between journal score and the amount of support in 2014
TUBITAK’s support threshold is low

- Almost all WoS indexed journals supported
- One third barely meet the minimum criteria
- Support to more than 3,000 journals can be discontinued
- 80%-90% of journals received less than 2,500TL
- Only 5% of journals received more than 4,000TL
- Social Science journals are worse
Amount of TUBITAK support for Science vs. Social Science journals (2014)
Discussion

• Journals that performed poorly in 2012 did so in succeeding years, too
• 2013 and 2014 algorithms do not differ much
  – 2013: avg=701.00TL, median=564.00TL
  – 2014: avg=770.00TL, median=577.00TL
• Because both JIFs and AISs are based on the number of citations and highly correlated
• TUBITAK nullified its earlier decision of not supporting Group C Science journals, although a few Group C Science journals performed differently in 2013 and 2014
• TUBITAK’s support does not seem to encourage authors to publish in more prestigious journals
Conclusions

- JIF: “fatal attraction”, “poor man’s citation analysis”
- Bibliometric performance measures alone are not the sole criteria for research assessment and . . . they “should be applied only as a collective group (and not individually)” (IEEE, 2013, original emphasis)
- JIF should not supplant peer review but support it
- Different publication/citation practices by different fields should be taken into account
- Bibliometric measures should not be used to measure the quality of papers, researchers and institutions and compare them with each other

Source: Van Raan, 2005; IEEE, 2013; Hicks et al., 2015; Marx & Bornmann, 2013; http://am.ascb.org/dora/
Epilogue

“Not everything that counts can be counted, and not everything that can be counted counts.”

-- William Bruce Cameron, 1963

“When a measure becomes a target, it ceases to be a good measure.”

-- Charles Goodhart, 1975

Sources

- Centre for Science and Technology Studies. (2007). Scoping study on the use of bibliometric analysis to measure the quality of research in UK higher education institutions. Report to HEFCE. Leiden: Centre for Science and Technology Studies, Leiden University.
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