Managing research at a national level

Ural Federal University
6th October 2015

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**Rankings:**

**THE TIMES HIGHER EDUCATION SUPPLEMENT**

World University Rankings 2014/15 & 2015/16:

- overall: 13th  14th  4th  2nd
- engineering and technology: 6th  5th
- life sciences: 10th  3rd
- clinical, pre-clinical and health: 4th  3rd
- physical sciences: 12th  6th

**QS**

World University Rankings 2014/15:

- overall: 2nd  8th  2nd  3rd
- engineering and technology: 6th  4th
- life sciences & medicine: 9th  3rd
- physical sciences: 11th  3rd
UK context: 14% yearly decreased funding
Global context

• Research becoming more interdisciplinary and more international

• Traditional discipline structures do not map onto new research programmes

• New funding patterns bring academics together across international boundaries
Russia in the world – peers & publications per year
## Russia in the world – FWCI for 2010 -14

<table>
<thead>
<tr>
<th>Country</th>
<th>Publications</th>
<th>Authors</th>
<th>Field-Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>2,996,708</td>
<td>2,179,623</td>
<td>1.46</td>
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<tr>
<td>China</td>
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Global context: article share and FWCI, 2008-12

FWCI = Field Weighted Citation Index = ratio of citations actually received and the number which would be expected based on the average of the subject field.
Russia in the world – peers and FWCI per year

Countries and Groups
- Brazil
- Iran
- Netherlands
- Russian Federation
- Taiwan

Field-Weighted Citation Impact

Publication Year

Russia overall research performance 2010-14

Number of publications

Field-Weighted Citation Impact

Physics and Astronomy
Materials Science
Engineering
Chemistry
Mathematics
Biochemistry, Genetics and Molecular Biology
Earth and Planetary Sciences
Medicine
Computer Science
Agricultural and Biological Sciences
Chemical Engineering
Energy
Environmental Science
Social Sciences
Immunology and Microbiology
Pharmacology, Toxicology and Pharmaceutics
Arts and Humanities
Multidisciplinary
Neuroscience
Business, Management and Accounting
Economics, Econometrics and Finance
Health Professions
Russia compared to the world-performance indicators 2010 - 2014
Global context: quality of output (measured by FWCI) correlated with international collaboration

Correlation between international co-authorship share and field-weighted citation impact of internationally co-authored articles, 2008
Impact of Russia collaborating with strong research nations 2010 - 14

<table>
<thead>
<tr>
<th>Country</th>
<th>Co-authored publications</th>
<th>Co-authors in the Russian Federation</th>
<th>Co-authors in the other Country</th>
<th>Field-Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>15,778 ▲</td>
<td>17,038 ▲</td>
<td>36,475 ▲</td>
<td>2.24</td>
</tr>
<tr>
<td>Germany</td>
<td>15,581 ▲</td>
<td>15,974 ▲</td>
<td>22,427 ▲</td>
<td>2.01</td>
</tr>
<tr>
<td>France</td>
<td>9,340 ▲</td>
<td>10,700 ▲</td>
<td>13,022 ▲</td>
<td>2.36</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>7,865 ▲</td>
<td>9,139 ▲</td>
<td>12,938 ▲</td>
<td>2.88</td>
</tr>
<tr>
<td>Italy</td>
<td>6,105 ▲</td>
<td>6,805 ▲</td>
<td>12,876 ▼</td>
<td>2.96</td>
</tr>
<tr>
<td>Spain</td>
<td>4,802 ▲</td>
<td>5,572 ▲</td>
<td>6,390 ▼</td>
<td>3.31</td>
</tr>
<tr>
<td>China</td>
<td>4,524 ▲</td>
<td>5,778 ▲</td>
<td>7,023 ▲</td>
<td>2.97</td>
</tr>
<tr>
<td>Japan</td>
<td>4,434 ▲</td>
<td>5,521 ▲</td>
<td>8,064 ▲</td>
<td>2.64</td>
</tr>
<tr>
<td>Poland</td>
<td>4,286 ▲</td>
<td>5,538 ▲</td>
<td>3,671 ▲</td>
<td>2.67</td>
</tr>
<tr>
<td>Ukraine</td>
<td>4,197 ▲</td>
<td>6,193 ▲</td>
<td>4,253 ▲</td>
<td>1.58</td>
</tr>
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The diagram illustrates the collaboration FWCI times/fold increase for the top 20 international collaborators with Russia. The bubble size represents the number of co-authored publications with Russia. The source of the data is Scopus data from 2008-2012.
Unlike many research intensive countries or emerging countries (BRICS), Russia’s most collaboration type is not international collaboration, rather it’s within institutions. This shows even some increase in the last couple of years.

International collaboration is stable and even decreasing in 2014. This is not a healthy development for Russia for increasing the overall FWCI.

National collaboration is on the rise with a notable increase of 3.1%.

If the international collaboration rate was higher, the overall FWCI will be higher than the current 0.67 (below average). Other countries are benefiting greatly from the FWCI of internationally co-authored papers as the rate there is much higher than the 26% observed in 2014 for Russia.

The difference between the FWCI of international collaboration and the rest of the other types is more than 3 times.
What does collaboration achieve for the UK and for the countries with which it collaborates?

Field-weighted citation impact of UK internationally co-authored articles by co-authoring country, 2008-2012. Bubble size is proportional to the number of co-authored articles.
Global co-authorship 2008-2012
Efficiency: global context: article output per $$ input (GERD = Gross Domestic Expenditure on R&D)
Efficiency: global quality of output per $$ input

(GERD = Gross Domestic Expenditure on R&D)
International mobility of UK researchers 1996-2012

- **Outflow**
  - Researchers: 7.0%
  - Relative Productivity: 0.81
  - Relative Seniority: 1.07
  - FWCI: 1.88

- **Returnees Outflow**
  - Researchers: 5.7%
  - Relative Productivity: 1.10
  - Relative Seniority: 1.14
  - FWCI: 1.76

- **Transitory (mainly non-UK)**
  - Researchers: 35.7%
  - Relative Productivity: 1.37
  - Relative Seniority: 1.09
  - FWCI: 1.97

- **Returnees Inflow**
  - Researchers: 3.1%
  - Relative Productivity: 1.46
  - Relative Seniority: 1.20
  - FWCI: 2.34

- **Transitory (mainly UK)**
  - Researchers: 13.8%
  - Relative Productivity: 0.81
  - Relative Seniority: 0.97
  - FWCI: 1.95

- **Inflow**
  - Researchers: 6.3%
  - Relative Productivity: 0.80
  - Relative Seniority: 1.06
  - FWCI: 2.10

- **Sedentary**
  - Researchers: 28.4%
  - Relative Productivity: 0.50
  - Relative Seniority: 0.82
  - FWCI: 1.66

- **Total Outflow**
  - Researchers: 12.7%
  - Relative Productivity: 0.95
  - Relative Seniority: 1.10
  - FWCI: 1.82

- **Total Transitory**
  - Researchers: 49.5%
  - Relative Productivity: 1.23
  - Relative Seniority: 1.06
  - FWCI: 1.97

- **Total Inflow**
  - Researchers: 9.4%
  - Relative Productivity: 1.04
  - Relative Seniority: 1.11
  - FWCI: 2.22

- **Non-UK**
What to do

• Focus on **quality not volume**
• Promote **focused international collaboration** (it’s not **how many** MoU’s but the quality of the relationship)
• Incentivise young academics (e.g. through **international movement**)
• **Reward** departments for number of PhD’s (? shorten length – UK universities penalised for PhDs taking > 3 years)
• Promote **inter-disciplinary research** (break down barriers between departments – e.g. joint seminars)
• Promote **efficiency** for academics (e.g. central **support** for funding applications e.g. one person manages big calls such as H2020)
• **Manage** the IP (e.g. reward staff and have an effective tech transfer unit)
• Actively **translate** successful models
Thank you

John Green
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*now Life Fellow, Queens’ College Cambridge*

jtg11@cam.ac.uk

UK government reports