RePEc’s impact on the use of working papers in institutional repositories

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Current status of Institutional Repository usage

• S. SATO & H. ITSUMURA (2009)
  – Most users found repository content through search engines.
  – English papers are more likely to be accessed through search engines than are Japanese.
  – Content translated into machine-editable text were downloaded many times more frequently than those that have not been translated.
Current status of Institutional Repository usage

• Most users found repository content through search engines.
  – Almost all of them were via Google.
  – Does PageRank decide how many times repository content will be used?

• One of few exceptions: RePEc
What is RePEc?

- Research Papers in Economics (http://repec.org)
- A subject repository to promote scholarly communication in economics
- Includes 240,000 working papers
- Some Japanese institutions including Institute of Developing Economies, Japan External Trade Organization (IDE-JETRO) have registered their contents
Types of Referrals to ARRIDE (IDE-JETRO)

Types of referrals to all content

- Direct access: 2505 (18%)
- Thorough metadata page: 2477 (18%)
- Thorough search engine: 2688 (19%)
- Through RePEc: 5765 (41%)

Types of referrals to content added to RePEC

- Direct access: 554 (5%)
- Thorough metadata page: 1610 (14%)
- Thorough search engine: 1301 (12%)
- Through RePEc: 2070 (18%)
- Through other pages: 5765 (51%)
More issues

• What impact does RePEc have on institutional repository usage?
  – Number of downloads

• What will be used through RePEc?
  – Content attributes

• Who will use it?
  – User domains

• Is RePEc different from other referrals?
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Methods

• Object repositories
  – ARRIDE (The Academic Research Repository at the Institute of Developing Economies)
  – HERMES-IR (Hitotsubashi University Repository)

• Object contents
  – ARRIDE: Content added to RePEc / $N=240$
  – HERMES-IR: All working papers / $N=1,648$
    (including 900 items added to RePEc)
Methods

• Research period
  – ARRIDE: 2008.1-12

• Usage log analysis
Content registered to RePEc in ARRIDE

- **240/640** (37.5%) were registered to RePEc
- Titles registered to RePEc
  - “IDE Discussion Paper”: 179 items
  - “The Developing Economies”: 61 items
- All content registered to RePEc is in English.
- IDE-JETRO began to register items to RePEc before our analysis.
<table>
<thead>
<tr>
<th>Language Type</th>
<th>Japanese papers</th>
<th>English papers</th>
<th>Other Languages papers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not added to RePEc</td>
<td>222</td>
<td>516</td>
<td>10</td>
<td>748</td>
</tr>
<tr>
<td>Added to RePEc*</td>
<td>275</td>
<td>619</td>
<td>6</td>
<td>900</td>
</tr>
<tr>
<td>Total</td>
<td>497</td>
<td>1135</td>
<td>16</td>
<td>1,648</td>
</tr>
</tbody>
</table>

* All papers were registered to RePEc after April 2009.
Log filtering procedure

The original version is Japanese and English version was offered by Y. Sato.
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(1) ARRIDE
Number of user domains for content added to RePEc (ARRIDE)

User domain (Through RePEc/ JP or not JP)

Total: 3,447 downloads

- JP: 164, 5%
- not JP: 3,283, 95%

User domain (Through other referrals/ JP or not JP)

Total: 4,401 downloads

- JP: 595, 14%
- not JP: 3,806, 86%
Correlation between the number of downloads through RePEc and through Search engines (ARRIDE)

\[
\log_{10} \left( \text{the number of downloads through RePEc} + 1 \right)
\]

\[
\log_{10} \left( \text{the number of downloads through search engines} + 1 \right)
\]
Correlation between the number of downloads through RePEc and through other referrals (ARRIDE)

<table>
<thead>
<tr>
<th></th>
<th>Direct access</th>
<th>Through metadata page</th>
<th>Through search engines</th>
<th>Through RePEc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct access</td>
<td></td>
<td>0.34(***)</td>
<td>0.40(***)</td>
<td>0.43(***)</td>
</tr>
<tr>
<td>Through metadata page</td>
<td></td>
<td></td>
<td>0.08</td>
<td>0.53(***)</td>
</tr>
<tr>
<td>Through search engines</td>
<td></td>
<td></td>
<td></td>
<td>0.10</td>
</tr>
<tr>
<td>Through RePEc</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Statistically significant ($p < 0.01$)
(2) HERMES-IR
Hitotsubashi University began to register WPs to RePEc.
Relationship between RePEc registration and the number of content downloads

Table 2. RePEc registration and average number of downloads (After April 2009)

<table>
<thead>
<tr>
<th></th>
<th>Total downloads</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Direct access</td>
<td>Through metadata page</td>
<td>Through search engines</td>
<td>Through RePEc</td>
<td>Through other referrals</td>
<td>User domains</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>JP</td>
<td>Not JP</td>
</tr>
<tr>
<td>Not added to RePEc</td>
<td>Avg.</td>
<td>5.8</td>
<td>1.0</td>
<td>1.7</td>
<td>3.0</td>
<td>0.0</td>
<td>0.2</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>Med.</td>
<td>2.0</td>
<td>0.0</td>
<td>1.0</td>
<td>1.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Added to RePEc</td>
<td>Avg.</td>
<td>10.4</td>
<td>2.0</td>
<td>2.6</td>
<td>3.7</td>
<td>1.7</td>
<td>0.4</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td>Med.</td>
<td>5.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>0.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>Avg.</td>
<td>8.3</td>
<td>1.5</td>
<td>2.2</td>
<td>3.4</td>
<td>0.9</td>
<td>0.3</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>Med.</td>
<td>4.0</td>
<td>0.0</td>
<td>1.0</td>
<td>1.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>
# Relationship between language and the number of downloads through RePEc

## Table 3. Language and average number of downloads (Content added to RePEc/After April 2009)

<table>
<thead>
<tr>
<th></th>
<th>Total downloads</th>
<th>Types of referrals</th>
<th>User domains</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Direct access</td>
<td>Through metadata page</td>
<td>Through search engines</td>
</tr>
<tr>
<td><strong>Japanese papers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg.</td>
<td>15.9</td>
<td>2.3</td>
<td>4.4</td>
</tr>
<tr>
<td>Med.</td>
<td>10.0</td>
<td>1.0</td>
<td>3.0</td>
</tr>
<tr>
<td><strong>English papers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg.</td>
<td>8.0</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Med.</td>
<td>4.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg.</td>
<td>10.4</td>
<td>2.0</td>
<td>2.6</td>
</tr>
<tr>
<td>Med.</td>
<td>5.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>
Number of user domains for content added to RePEc (HERMES-IR)

User domain (Through RePEc/ JP or not JP)

- Total: 1,008 downloads
- 233, 23% (JP)
- 775, 77% (not JP)

User domain (Through other referrals/ JP or not JP)

- Total: 5,532 downloads
- 2107, 38% (JP)
- 3425, 62% (not JP)
<table>
<thead>
<tr>
<th></th>
<th>Series Title</th>
<th>All items</th>
<th>Written in Japanese</th>
<th>Written in English</th>
<th>Other languages</th>
<th>RePEc registration date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CCES Discussion Paper Series</td>
<td>20</td>
<td>2</td>
<td>18</td>
<td>0</td>
<td>2009/4/20</td>
</tr>
<tr>
<td>2</td>
<td>IIR Working Paper</td>
<td>59</td>
<td>12</td>
<td>47</td>
<td>0</td>
<td>2009/4/17</td>
</tr>
<tr>
<td>3</td>
<td>Discussion papers / Graduate School of Economics, Hitotsubashi University</td>
<td>141</td>
<td>26</td>
<td>115</td>
<td>0</td>
<td>2009/4/30</td>
</tr>
<tr>
<td>4</td>
<td>CEI Working Paper Series</td>
<td>178</td>
<td>19</td>
<td>159</td>
<td>0</td>
<td>2009/5/13</td>
</tr>
<tr>
<td>6</td>
<td>Discussion paper / Setting Options for Fair Distribution of Well-being among Different Generations, PIE</td>
<td>283</td>
<td>107</td>
<td>171</td>
<td>5</td>
<td>2009/6/15</td>
</tr>
<tr>
<td>7</td>
<td>Discussion paper / Economic Analysis of Intergenerational Issues, PIE</td>
<td>40</td>
<td>14</td>
<td>26</td>
<td>0</td>
<td>2009/6/16</td>
</tr>
<tr>
<td>8</td>
<td>PIE/CIS Discussion paper</td>
<td>110</td>
<td>49</td>
<td>60</td>
<td>1</td>
<td>2009/6/16</td>
</tr>
<tr>
<td>9</td>
<td>RRC Working Paper Series</td>
<td>19</td>
<td>7</td>
<td>12</td>
<td>0</td>
<td>2009/7/24</td>
</tr>
</tbody>
</table>
The day series 1 was registered to RePEc.
<table>
<thead>
<tr>
<th></th>
<th>Series Title</th>
<th>RePEc registration date</th>
<th>A: Avg. downloads per day before RePEc registration</th>
<th>B: Avg. downloads per day after RePEc registration</th>
<th>B / A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CCES Discussion Paper Series</td>
<td>2009/4/20</td>
<td>0.7</td>
<td>14.0</td>
<td>21.0</td>
</tr>
<tr>
<td>2</td>
<td>IIR Working Paper</td>
<td>2009/4/17</td>
<td>0.6</td>
<td>6.1</td>
<td>10.1</td>
</tr>
<tr>
<td>3</td>
<td>Discussion papers / Graduate School of Economics, Hitotsubashi University</td>
<td>2009/4/30</td>
<td>3.5</td>
<td>11.3</td>
<td>3.3</td>
</tr>
<tr>
<td>4</td>
<td>CEI Working Paper Series</td>
<td>2009/5/13</td>
<td>3.3</td>
<td>22.6</td>
<td>6.9</td>
</tr>
<tr>
<td>5</td>
<td>Working Paper Series / Center for Japanese Business Studies</td>
<td>2009/6/11</td>
<td>1.1</td>
<td>1.0</td>
<td>0.9</td>
</tr>
<tr>
<td>6</td>
<td>Discussion paper / Setting Options for Fair Distribution of Well-being among Different Generations, PIE</td>
<td>2009/6/15</td>
<td>5.2</td>
<td>7.7</td>
<td>1.5</td>
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<tr>
<td>7</td>
<td>Discussion paper / Economic Analysis of Intergenerational Issues, PIE</td>
<td>2009/6/16</td>
<td>0.6</td>
<td>1.0</td>
<td>1.6</td>
</tr>
<tr>
<td>8</td>
<td>PIE/CIS Discussion paper</td>
<td>2009/6/16</td>
<td>2.2</td>
<td>3.5</td>
<td>1.6</td>
</tr>
<tr>
<td>9</td>
<td>RRC Working Paper Series</td>
<td>2009/7/24</td>
<td>0.6</td>
<td>5.0*</td>
<td>8.3</td>
</tr>
</tbody>
</table>

* Calculated from 10 days of download statistics. Others were from a month’s worth.
Correlation between the number of downloads through RePEc and through Search engines (HERMES-IR)

\[
\log_{10}(\text{the number of downloads through RePEc} + 1)
\]

\[
\log_{10}(\text{the number of downloads through search engines} + 1)
\]
Correlation between the number of downloads through RePEc and through Search engines (HERMES-IR)

<table>
<thead>
<tr>
<th></th>
<th>Direct access</th>
<th>Through metadata page</th>
<th>Through search engines</th>
<th>Through RePEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct access</td>
<td></td>
<td>0.22(**)</td>
<td>0.41(**)</td>
<td>0.43(**)</td>
</tr>
<tr>
<td>Through metadata</td>
<td></td>
<td></td>
<td>0.26(**)</td>
<td>0.11(**)</td>
</tr>
<tr>
<td>search engines</td>
<td></td>
<td></td>
<td></td>
<td>0.27(**)</td>
</tr>
<tr>
<td>Through RePEC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Statistically significant ($p < 0.01$)
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Conclusion

• Registration with RePEc has a strong impact on English papers and users from overseas.

• RePEc helps users find content that cannot be found through search engines.

• RePEc plays a central role as one of the various ways to find repository content.
Acknowledgements

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