An Employability Index tested by a national dynamic administrative database

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One assessment of the *employability index* based on the analysis of data regarding *National Civil Service Programme* young participants gathered from employment results recorded in the administrative database “*Comunicazioni Obbligatorie*”
Presentation

• Employability Framework

• Pilot context (NCS survey)
  – Index development
  – Employability Index Results (OKI)

• Definition of Employment
  – Employment declared during the interviews
  – Employment detected by the COB system

• Employability Index and Employment Evidence
  – Employment results by employability groups and comparison with the proxy var. educational level
  – The correlation between employment and employability
  – A logistic regression model that provides the probability/likelihood of being employed
Employability

**EMPLOYABILITY = CAPABILITY TO FIND WORK**

*Probability of being employed* (as Total Employability) = [contextual factors] + [Individual factors]

**Contextual factors**
- Economic conditions, job market
- Local environment

**Individual factors**
- Demographic variables (i.e. gender, age...)
- Individual employability

JOB (Probability of being employed)
Research project: Inapp – Civil Service Survey

QUALITATIVE SURVEY

Interviews of participants and tutors
Expo, Youth Guarantee

Ex-ante Survey (NCS 2015)

• Interviews during the CS
  Population 27,779
  Sample 1,000

QUANTITATIVE SURVEYS

Censal survey
NCS abroad

Ex-post Survey (NCS 2013)

• Interviews after 12-18 months
  Population 13,375
  Sample 1,500

Sample surveys
National CS

Ex-post Survey (Y.G.)

• Interviews after 6 months
  Population 4,250
  Sample 1,000

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Sample surveys
National CS

Ex-post Survey (Y.G.)

• Interviews after 6 months
  Population 4,250
  Sample 1,000
Individual employability dimensions

- Educational level
- Certification of competence
- On learning

EDUCATION

- Number of experiences
- Type of experiences

EXPERIENCE

- Active job search
- Curriculum
- Planning

ACTIVATION

- History
- Resources
- Inclination

MOBILITY
Evidence
The Individual Employability Sub-Index

EDUCATION

ACTIVATION

EXPERIENCES

MOBILITY
## Individual employability Index (OKI)

<table>
<thead>
<tr>
<th>Sub-index</th>
<th>Lowest</th>
<th>Highest</th>
<th>Mean</th>
<th>St.Dev.</th>
<th>Regr. B (N. stand.)</th>
<th>Regr. B (Stand.)</th>
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<tbody>
<tr>
<td>Education</td>
<td>0</td>
<td>10</td>
<td>4,91</td>
<td>2,49</td>
<td>0,25</td>
<td>0,44</td>
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<tr>
<td>Experience</td>
<td>0</td>
<td>10</td>
<td>4,53</td>
<td>2,56</td>
<td>0,25</td>
<td>0,46</td>
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<tr>
<td>Activation</td>
<td>0</td>
<td>10</td>
<td>8,37</td>
<td>2,14</td>
<td>0,25</td>
<td>0,38</td>
</tr>
<tr>
<td>Mobility</td>
<td>0</td>
<td>10</td>
<td>4,36</td>
<td>1,73</td>
<td>0,25</td>
<td>0,31</td>
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<tr>
<td>Individual Employability Index (OKI)</td>
<td>0,54</td>
<td>9,46</td>
<td>5,54</td>
<td>1,40</td>
<td></td>
<td></td>
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</table>
### Individual Employability Index (OKI)

<table>
<thead>
<tr>
<th>Survey</th>
<th>OKI</th>
<th>Education</th>
<th>Experience</th>
<th>Activation</th>
<th>Mobility</th>
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<tbody>
<tr>
<td>NCS 2013</td>
<td>5.69</td>
<td>5.15</td>
<td>4.66</td>
<td>8.49</td>
<td>4.45</td>
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<tr>
<td>Youth Guarantee</td>
<td>5.09</td>
<td>4.18</td>
<td>4.12</td>
<td>8.00</td>
<td>4.06</td>
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<table>
<thead>
<tr>
<th>Gender</th>
<th>OKI</th>
<th>Education</th>
<th>Experience</th>
<th>Activation</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5.14</td>
<td>4.03</td>
<td>4.29</td>
<td>8.07</td>
<td>4.17</td>
</tr>
<tr>
<td>Female</td>
<td>5.75</td>
<td>5.38</td>
<td>4.65</td>
<td>8.53</td>
<td>4.46</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Geographic Area</th>
<th>OKI</th>
<th>Education</th>
<th>Experience</th>
<th>Activation</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Italy</td>
<td>6.04</td>
<td>5.46</td>
<td>4.99</td>
<td>8.87</td>
<td>4.85</td>
</tr>
<tr>
<td>Central Italy</td>
<td>5.85</td>
<td>5.19</td>
<td>4.89</td>
<td>8.70</td>
<td>4.62</td>
</tr>
<tr>
<td>Southern Italy</td>
<td>5.17</td>
<td>4.64</td>
<td>4.10</td>
<td>7.93</td>
<td>4.00</td>
</tr>
<tr>
<td>Islands</td>
<td>5.22</td>
<td>4.36</td>
<td>4.28</td>
<td>8.16</td>
<td>4.06</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OKI</th>
<th>Education</th>
<th>Experience</th>
<th>Activation</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Means</td>
<td>5.54</td>
<td>4.91</td>
<td>4.52</td>
<td>8.37</td>
</tr>
</tbody>
</table>
Declared and detected employment condition

NATIONAL CIVIL SERVICE
employment situation declared during the interviews
(6-18 months after the end of NCS)

MINISTRY OF LABOUR
Selection workers’ catalogue (COB)
(only employees)
working days in the years after the NCS
Declared employment situation

- Employed: 37.0%
- Student Employee: 10.6%
- Unemployed/In Search of Employment: 37.3%
- Students: 12.7%
- Inactive: 1.1%
- Other: 1.2%
Individual Employability Index and Sub-index by declared employed situation (means)

<table>
<thead>
<tr>
<th>Sub-index</th>
<th>Unemployed</th>
<th>Employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>OKI</td>
<td>5.29</td>
<td>5.82</td>
</tr>
<tr>
<td>Education</td>
<td>4.72</td>
<td>5.13</td>
</tr>
<tr>
<td>Experiences</td>
<td>4.08</td>
<td>5.02</td>
</tr>
<tr>
<td>Activation</td>
<td>8.07</td>
<td>8.71</td>
</tr>
<tr>
<td>Mobility</td>
<td>4.29</td>
<td>4.43</td>
</tr>
</tbody>
</table>
### Employability and Educational Level by declared employed situation

<table>
<thead>
<tr>
<th>OKI (grouped)</th>
<th>% of Employed Oct. 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERY LOW (0-4)</td>
<td>32.5%</td>
</tr>
<tr>
<td>LOW (4-5)</td>
<td>41.6%</td>
</tr>
<tr>
<td>HIGH (5-6)</td>
<td>47.3%</td>
</tr>
<tr>
<td>VERY HIGH (6-10)</td>
<td>57.1%</td>
</tr>
<tr>
<td>Total</td>
<td>47.6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Educational Level (declared)</th>
<th>% of Employed Oct. 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIMARY SCHOOL</td>
<td>36.1%</td>
</tr>
<tr>
<td>SECONDARY SCHOOL</td>
<td>45.2%</td>
</tr>
<tr>
<td>BACHELOR’S DEGREE</td>
<td>48.3%</td>
</tr>
<tr>
<td>MASTER’S DEGREE</td>
<td>56.2%</td>
</tr>
<tr>
<td>Total</td>
<td>47.6%</td>
</tr>
</tbody>
</table>

**RANGE OF VARIATION**
- **Employability**: 24.7
- **Educational Level**: 20.1

Employee with a regular contract → 33.4%
## Employment by OKI and Ed. Level (grouped)

<table>
<thead>
<tr>
<th>OKI (grouped)</th>
<th>AT LEAST A DAY IN 2017 (all contracts)</th>
<th>AT LEAST A DAY IN 2017 (perm &amp; fixed)</th>
<th>AT LEAST 350 DAYS IN 2017 (all contracts)</th>
<th>WORKING DAYS IN 2017 (all contracts)</th>
<th>WORKING DAYS IN 2017 (perm &amp; fixed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERY LOW(0-4)</td>
<td>43,5%</td>
<td>35,8%</td>
<td>12,5%</td>
<td>92</td>
<td>70</td>
</tr>
<tr>
<td>LOW(4-5)</td>
<td>55,8%</td>
<td>40,8%</td>
<td>18,2%</td>
<td>120</td>
<td>85</td>
</tr>
<tr>
<td>HIGH(5-6)</td>
<td>64,0%</td>
<td>51,5%</td>
<td>21,3%</td>
<td>146</td>
<td>114</td>
</tr>
<tr>
<td>VERY HIGH(6-10)</td>
<td>73,1%</td>
<td>61,6%</td>
<td>25,1%</td>
<td>181</td>
<td>153</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>62,7%</strong></td>
<td><strong>50,7%</strong></td>
<td><strong>20,8%</strong></td>
<td><strong>146</strong></td>
<td><strong>116</strong></td>
</tr>
<tr>
<td><strong>RANGE OF VARIATION</strong></td>
<td><strong>29,6%</strong></td>
<td><strong>25,8%</strong></td>
<td><strong>12,6%</strong></td>
<td><strong>90</strong></td>
<td><strong>83</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EDUCATIONAL LEVEL (declared)</th>
<th>AT LEAST A DAY IN 2017 (all contracts)</th>
<th>AT LEAST A DAY IN 2017 (perm &amp; fixed)</th>
<th>AT LEAST 350 DAYS IN 2017 (all contracts)</th>
<th>WORKING DAYS IN 2017 (all contracts)</th>
<th>WORKING DAYS IN 2017 (perm &amp; fixed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIMARY SCHOOL</td>
<td>57,0%</td>
<td>41,4%</td>
<td>17,0%</td>
<td>113</td>
<td>76</td>
</tr>
<tr>
<td>SECONDARY SCHOOL</td>
<td>58,1%</td>
<td>45,7%</td>
<td>18,8%</td>
<td>127</td>
<td>98</td>
</tr>
<tr>
<td>BACHELOR’S DEGREE</td>
<td>68,1%</td>
<td>56,8%</td>
<td>24,4%</td>
<td>168</td>
<td>139</td>
</tr>
<tr>
<td>MASTER’S DEGREE</td>
<td>69,9%</td>
<td>58,8%</td>
<td>22,6%</td>
<td>177</td>
<td>145</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>62,7%</strong></td>
<td><strong>50,7%</strong></td>
<td><strong>20,8%</strong></td>
<td><strong>146</strong></td>
<td><strong>116</strong></td>
</tr>
<tr>
<td><strong>RANGE OF VARIATION</strong></td>
<td><strong>12,9%</strong></td>
<td><strong>17,4%</strong></td>
<td><strong>5,6%</strong></td>
<td><strong>64</strong></td>
<td><strong>68</strong></td>
</tr>
</tbody>
</table>
Employment (% employed) by OKI (grouped)

% EMPLOYED (declared, oct.2018)

- VERY LOW (0-4) = 32%
- LOW (4-5) = 42%
- HIGH (5-6) = 57%
- VERY HIGH (6-10) = 57%

% EMPLOYED with regular contract (declared, oct.2018)

- VERY LOW (0-4) = 17%
- LOW (4-5) = 27%
- HIGH (5-6) = 35%
- VERY HIGH (6-10) = 42%

% EMPLOYED ALMOST A DAY IN 2017

- VERY LOW (0-4) = 44%
- LOW (4-5) = 56%
- HIGH (5-6) = 64%
- VERY HIGH (6-10) = 73%

% EMPLOYED ALMOST A DAY IN 2017 (perm., fixed term)

- VERY LOW (0-4) = 36%
- LOW (4-5) = 41%
- HIGH (5-6) = 52%
- VERY HIGH (6-10) = 62%

% EMPLOYED ALMOST 365 DAYS IN 2017

- VERY LOW (0-4) = 12%
- LOW (4-5) = 18%
- HIGH (5-6) = 21%
- VERY HIGH (6-10) = 25%
Employment (working days) by OKI (grouped)

WORKING DAYS IN 2107

- VERY LOW (0-4): 92
- LOW (4-5): 120
- HIGH (5-6): 146
- VERY HIGH (6-10): 181

WORKING DAYS IN 2107 (perm., fixed term)

- VERY LOW (0-4): 70
- LOW (4-5): 85
- HIGH (5-6): 114
- VERY HIGH (6-10): 153
CORRELATIONS: EMPLOYED SITUATION BY OKI*, OKI(grouped), ** EDUCATIONAL LEVEL**

*Correlation index by Pearson
** Correlation index by Spearman

- % EMPLOYED (declared, oct.2018)
  - OKI: 0.190
  - OKI (grouped): 0.181
  - ED.LEVEL: 0.067

- % EMPLOYED with regular contract (declared, oct.2018)
  - OKI: 0.191
  - OKI (grouped): 0.172
  - ED.LEVEL: 0.092

- % EMPLOYED ALMOST A DAY IN 2017
  - OKI: 0.213
  - OKI (grouped): 0.207
  - ED.LEVEL: 0.11

- % EMPLOYED ALMOST A DAY IN 2017 (perm., fixed term)
  - OKI: 0.203
  - OKI (grouped): 0.219
  - ED.LEVEL: 0.141

- % EMPLOYED ALMOST 365 DAYS IN 2017
  - OKI: 0.120
  - OKI (grouped): 0.103
  - ED.LEVEL: 0.055

- WORKING DAYS IN 2017
  - OKI: 0.231
  - OKI (grouped): 0.215
  - ED.LEVEL: 0.144

- WORKING DAYS IN 2017 (perm., fixed term)
  - OKI: 0.198
  - OKI (grouped): 0.198
  - ED.LEVEL: 0.122
Individual employability effects on the prob. of working

$Y = f (\text{constant, geographic area, gender, OKI, } \varepsilon)$
A logit regression model: the probability of being employed.

Almost a working day in 2017

Geo. Area, Gender, Individual employability

<table>
<thead>
<tr>
<th>Logistic binary regression</th>
<th>Exp(B)</th>
<th>Sign.</th>
<th>95% C.I. per EXP(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Living in Islands (base line = 1)</strong></td>
<td></td>
<td></td>
<td>low</td>
</tr>
<tr>
<td>Living in Northern Italy</td>
<td>2,820</td>
<td>0,000</td>
<td>2,519</td>
</tr>
<tr>
<td>Living in Central Italy</td>
<td>2,128</td>
<td>0,000</td>
<td>1,883</td>
</tr>
<tr>
<td>Living in Southern Italy</td>
<td>1,061</td>
<td>0,267</td>
<td>0,955</td>
</tr>
<tr>
<td><strong>Gender Female (base line Male=1)</strong></td>
<td>1,294</td>
<td>0,000</td>
<td>1,194</td>
</tr>
<tr>
<td><strong>OKI very low (base line=1)</strong></td>
<td></td>
<td></td>
<td>0,000</td>
</tr>
<tr>
<td>OKI low</td>
<td>1,336</td>
<td>0,000</td>
<td>1,173</td>
</tr>
<tr>
<td>OKI high</td>
<td>1,624</td>
<td>0,000</td>
<td>1,430</td>
</tr>
<tr>
<td>OKI vetry high</td>
<td>2,339</td>
<td>0,000</td>
<td>2,063</td>
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<tr>
<td><strong>Constant</strong></td>
<td>0,629</td>
<td>0,000</td>
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</tr>
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</table>
A logit regression model: the probability of being employed

- **OKI very high**: 2.34
- **OKI high**: 1.62
- **OKI low**: 1.34
- **Gender Female (base = male)**: 1.29
- **living in southern Italy**: 1.00
- **living in central Italy**: 2.13
- **living in northern Italy**: 2.82
Work in Progress

Definition of the function $Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_3 + \epsilon_i$

$Y$ = Quantity and quality of work:
Prob. of being employed, working days, type and duration of contracts, etc.

$X_1$ = Local environments
$X_2$ = Individual demographic vars
$X_3$ = Individual Employability Index
Thnk you for attention!
SERGIO
s.ferri@inapp.org