Intellectual Capital of Nations
- some findings by ELSS methodology
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The best countries by National Intangible Capital (NIC) 2011
Countries where NIC acts as a strong economic driver (2011)
ELSS - intelligent database for analysing economic impact of NIC

www.nic4nations.com

• Basic NIC model by Leif Edvinsson

• Initial NIC database by Carol Lin; extended and further developed by Carol Lin & Pirjo Ståhle
  -> Analyses and country comparisons based on levels of NIC indicators

• Methodology by Pirjo Ståhle and Sten Ståhle
  -> NIC indicators validated by the effects of time and country specifics
  -> Analyses and country comparisons based on economic impact of NIC
National Intellectual Capital

Human Capital
- Capacity and capability of people
- Global business attractiveness
- Knowledge creation, exploitation, and innovation

Structural Capital

Market Capital
- Potential for future earnings
- Operational functionality of society

Organization Capital
- Renewal capital
- Process capital

Based on Edvisson & Malone 1997
# Human Capital
Capacity and capability of people

1. Skilled labor*
2. Employee training*
3. Higher education achievement
4. Pupil-teacher ratio
5. Public expenditure on education
6. 15-64 years old population
7. Qualified engineers*
8. Students’ PISA performance
9. Human Development Index
10. Gender equality
11. Years of education
12. R&D researchers

Source: Lin and Ståhle 2011
## Process Capital
Operational functionality of society

1. Business competition environment *
2. Government efficiency *
3. Computer per capita + Mobile subscribers
4. Internet subscribers + Broadband subscribers
5. Convenience of establishing new firms + start up days *
6. Goods & services distribution efficiency *
7. Overall productivity
8. Unemployment % and youth unemployment %
9. Consumer price inflation
10. Health & environment
11. Corruption
12. Freedom of speech

Source: Lin and Ståhle 2011
Market Capital
Global business attractivity

1. Corporate tax encouragement*
2. Cross border venture*
3. Openness of culture*
4. Transparency of government policies*
5. Image of the country*
6. Capital availability*
7. Trade to GDP ratio (exports + imports)
8. Current account balance %GDP
9. Investment flows %GDP
10. Country credit rating
11. Investment risk
12. Globalization index

Source: Lin and Ståhle 2011
Renewal Capital
Knowledge creation, exploitation and innovation

1. Business R&D spending
2. Basic research*
3. R&D spending/GDP
4. R&D US$ per capita
5. IP right protection*
6. Utility Patents/ R&D expenditure
7. Cooperation between corporations and university*
8. Scientific articles
9. Patents per capita (USTPO+EPO)
10. Entrepreneurship*
11. Development & application of technology*
12. Venture capital*

Source: Lin and Ståhle 2011
ELSS methodology in a nutshell

- **IC indicators** are augmented into Cobb-Douglas production function

- **Capital (K) and labor (L) are linked to the external economic specifics**
  - metropolization, structure of economy (public/private, industry/service, urban/rural), and demographics
  - national recourses and financial resources in excess
  - labour compensation (low/high) and tax rates (low/high).

- **IC indicators are based on validated national level measurements**
  - The indicators are tested via regression analysis or GDP, GDP/employer and TFP
  - The indicators take time and country specifics into account
NIC impact in GDP

- NIC impact in GDP formation ranges 16 % - 72 % of GDP.

- NIC impact in GDP annual growth varies between 0.25% - 2.15 %.
  - Depending on real growth this represents 10 – 100 % of real annual growth.
  - For advanced economies almost 75% of growth can be traced back to NIC (2001 – 2011.)
NIC impact (%) in GDP formation in upper (u), mid (m) and lower (l) level economies:

<table>
<thead>
<tr>
<th>Component</th>
<th>(u)</th>
<th>(m)</th>
<th>(l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIC total</td>
<td>66.5</td>
<td>47.8</td>
<td>29.0</td>
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<tr>
<td>Human capital HC</td>
<td>17.1</td>
<td>14.6</td>
<td>7.6</td>
</tr>
<tr>
<td>Market capital MC</td>
<td>14.5</td>
<td>10.6</td>
<td>8.7</td>
</tr>
<tr>
<td>Process capital PC</td>
<td>18.1</td>
<td>12.8</td>
<td>7.1</td>
</tr>
<tr>
<td>Renewal capital RC</td>
<td>16.7</td>
<td>9.6</td>
<td>5.6</td>
</tr>
</tbody>
</table>

In the upper class of economies 1% increase of NIC index level contributes 0.7% in GDP formation.

For mid and lower economies the corresponding gains in GDP formation are 0.9% and 1.5%.
During 2001 – 2011 the GDP impact of NIC has increased

- 12 % in advanced economies
- 26 % in mid economies
- 33 % in developing economies
<table>
<thead>
<tr>
<th>NIC48 /2011</th>
<th>Index NIC</th>
<th>Percentage share in GDP formation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NIC %</td>
<td>NHC %</td>
</tr>
<tr>
<td><strong>Weighted by GDP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td></td>
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<tr>
<td>European Union</td>
<td>6.7</td>
<td>51.6</td>
</tr>
<tr>
<td>EMU countries</td>
<td>6.7</td>
<td>49.8</td>
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<td>USA</td>
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<td></td>
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<tr>
<td>SCANDINAVIA</td>
<td>8.1</td>
<td>64.7</td>
</tr>
<tr>
<td>Sweden</td>
<td>8.5</td>
<td>72.5</td>
</tr>
<tr>
<td>Denmark</td>
<td>8.3</td>
<td>67.6</td>
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<tr>
<td>Finland</td>
<td>8.2</td>
<td>69.7</td>
</tr>
<tr>
<td>Norway</td>
<td>7.6</td>
<td>49.1</td>
</tr>
<tr>
<td>Iceland</td>
<td>7.5</td>
<td>56.4</td>
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<tr>
<td><strong>Economic groups</strong></td>
<td></td>
<td></td>
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<tr>
<td>ASEAN</td>
<td>5.3</td>
<td>39.6</td>
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<tr>
<td>BRICS</td>
<td>4.8</td>
<td>33.4</td>
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<tr>
<td>PIGSI</td>
<td>5.7</td>
<td>39.4</td>
</tr>
<tr>
<td><strong>Groups by wealth</strong></td>
<td></td>
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<tr>
<td>GDP/POP 1 /Rich</td>
<td>8.7</td>
<td>67.9</td>
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<td>GDP/POP 2 /Median</td>
<td>6.1</td>
<td>42.8</td>
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<tr>
<td>GDP/POP 3 /Poor</td>
<td>4.7</td>
<td>34.2</td>
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Some references


*Outstanding Paper Award Winner at the Literati Network Awards for Excellence 2009.

**Outstanding Paper Award Winner at the Literati Network Awards for Excellence 2012.