Longevity of buildings as an economic KPI

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Introduction

• Due to simplification 50 years is often assumed as lifetime of buildings.

• Illustrations of ERES venues to show the delusion.

• Threat of:
  • self-fulfilling prophecy,
  • missing opportunities.

• Real estate vs building industry.

• Building industry is too focussed on new buildings.

• Real estate is driven too far away of buildings due to indirect investment (liquidity).

• Longevity is a KPI for buildings.

• How are other fields looking at longevity?
<table>
<thead>
<tr>
<th>Human development group or region</th>
<th>Human Development Index value</th>
<th>Life expectancy at birth (years)</th>
<th>Mean years of schooling (years)</th>
<th>Expected years of schooling (years)</th>
<th>Gross national income per capita (2011 PPP$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high human development</td>
<td>0.885</td>
<td>0.890</td>
<td>79.7</td>
<td>80.2</td>
<td>11.7</td>
</tr>
<tr>
<td>High human development</td>
<td>0.723</td>
<td>0.735</td>
<td>73.9</td>
<td>74.5</td>
<td>8.1</td>
</tr>
<tr>
<td>Medium human development</td>
<td>0.601</td>
<td>0.614</td>
<td>67.1</td>
<td>67.9</td>
<td>5.5</td>
</tr>
<tr>
<td>Low human development</td>
<td>0.479</td>
<td>0.493</td>
<td>58.2</td>
<td>59.4</td>
<td>4.1</td>
</tr>
<tr>
<td>Arab States</td>
<td>0.675</td>
<td>0.682</td>
<td>69.7</td>
<td>70.2</td>
<td>6.2</td>
</tr>
<tr>
<td>East Asia and the Pacific</td>
<td>0.688</td>
<td>0.703</td>
<td>73.5</td>
<td>74.0</td>
<td>7.4</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>0.726</td>
<td>0.738</td>
<td>70.7</td>
<td>71.3</td>
<td>9.6</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>0.734</td>
<td>0.740</td>
<td>74.2</td>
<td>74.9</td>
<td>7.9</td>
</tr>
<tr>
<td>South Asia</td>
<td>0.573</td>
<td>0.588</td>
<td>66.4</td>
<td>67.2</td>
<td>4.7</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>0.468</td>
<td>0.502</td>
<td>55.2</td>
<td>56.8</td>
<td>4.8</td>
</tr>
<tr>
<td>World</td>
<td>0.693</td>
<td>0.702</td>
<td>70.3</td>
<td>70.8</td>
<td>7.7</td>
</tr>
</tbody>
</table>

PPP is purchasing power parity.
Source: Human Development Report Office calculations
Human Development Index

- Ongoing debate on the relevance and the perceived insight, especially on the income indicator


- Relevance of longevity and education as indicator for human development is not disputed

- ERES is already doing its part for education and global sharing of knowledge

- With the venues ERES is showing the relevance of longevity.
Building industry economic performance

• The global construction market is vast accounting for approximately 13-15% of the GDP, estimated to about US $12 trillion by 2020 (Robinson & Symonds, 2015).

• Economic growth as a result of an increasing (cost of) building sector has been taken for granted but disagreed more recently (Dlamini, 2012; Lopes, Balsa, & Nunes, 2011).

• Construction activity follows economic growth
Bon curve

- A milestone in this discussion is the introduction of the Bon curve, the inverted U-shaped relationship between the share of construction as a percentage of GNP and the GNP per capita.
- The building industry adapts to repair and maintenance.
- Cost illustrates significance in employment creation, capital formation and spill over effects, but does not drive economic growth (Dlamini, 2012).
- The real estate sector should adapt as well: from strong focus on new built towards opportunities of redevelopment as a services sector.
Capital value

- From the real estate perspective, capital value is the preferred indicator.
- To address longevity, value over time reflects a life cycle approach.
- Multiple users, a sequential of economic and functional lifetimes, during the lifetime of a building.
- Definitions of units and elements
  - Rates and returns,
  - Repeated initial costs
  - Operational and maintenance costs
  - Expected lifetimes per category
Longevity

- Lack of acceptable methods
  - 50 years not realistic.
  - No data on complete life cycles.
- Demolition rate not realistic.
  - Life time tables lacking ‘death or recovery’.
- Statistical data is growing
  - European project Inspire
  - Key Registers Buildings
  - Only recent demolition
- Rationale for demolition
  - Sample 6000 tall buildings
  - Social demolition

<table>
<thead>
<tr>
<th>Reason</th>
<th>number</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended development</td>
<td>24</td>
<td>67%</td>
</tr>
<tr>
<td>Obsolete</td>
<td>4</td>
<td>11%</td>
</tr>
<tr>
<td>Act of terrorism</td>
<td>4</td>
<td>11%</td>
</tr>
<tr>
<td>Fire</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Infrastructural development</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Constructive failure</td>
<td>1</td>
<td>3%</td>
</tr>
</tbody>
</table>
Conclusion

• Looking at the future: how to realize a development index for real estate (and get a better perspective on the future).

• Longevity
  • Close cooperation with Inspire (local),
  • Add information on end-of-life – reasoning and cost
  • Classification
  • Advanced life time tables

• Education
  • Support ERES and other open research networks
Conclusion (continued)

• Value
  • Research on typologies for LCC (Hughes, Ive, de Jong and many others),
  • Use BREEAM in use for structural collection,
  • Longevity and demolition (end-of-life).
• Not a new research project but tuned collaboration.
• Real estate service: it is not about the 1-2 % addition per annum but about the 98-99 % buildings in stock (and many adjustments over time).

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