Beyond GDP: new measures of well-being and sustainability

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Old questions, new answers;
GDP and its discontent;
1. Human development;
2. “Static sustainability”;
3. Comprehensive wealth;
Measures and policies.
Old questions

- Issues of well-being and sustainability have been around for quite a long time in economic analysis;
- Aristotle (4th BC): Economics and Ethics (greatest good: happiness)
- Bentham (1789): Utilitarianism and happiness (“it is the greatest happiness of the greatest number that is the measure of right and wrong”);
- Classical and neo-classical economics: growth and physical limits. Physiocrats (mid-18th century), Malthus (1798), Ricardo (1817), JS Mill (1848, “steady-state”), Jevons (1865, energy decline);
New answers

- « Beyond GDP »: conference sponsored by the EU in 2007;
- Stiglitz-Sen-Fitoussi Commission (2009);
- The global crisis: serious questions about economic analysis and policy; Did we have the right indicators? Where is the real crisis? Should we just go back to growth?
- Why is measurement of welfare and sustainability so important? Because “what is not measured is not managed”: measuring is governing;
GDP (gross domestic product) represents the value of goods and services produced in a country over a given period (usually a year or a quarter); GDP is also defined as the aggregated added value of all money-based economic activities;

Developed in the post WWII context: industrial growth, materialism, little ecological concern;

General problem: GDP is mainly appropriate for market goods and services that can be valued at their market price;

Problematic even for market activities: e.g. GDP and employment (“jobless recovery”), technical progress, etc.;
GDP and its discontent

- GDP positively values a number of expenditures that do not contribute to well-being and/or sustainability, on the contrary (e.g. incarceration expenditures, BP oil spill, etc.).

- Bobby Kennedy (1968): GDP « measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country, it measures everything in short, except that which makes life worthwhile »
What else?

Well-being / Sustainability

- Two major and distinct issues: well-being and sustainability;
- Well-being: What are the real drivers of human development? (static human well-being);
- Sustainability: Can we project/maintain/increase current well-being in time? (dynamic well-being under ecological constraint);
1. The HDI approach (WB) (1990)

"Human development, as an approach, is concerned with what I take to be the basic development idea: namely, advancing the richness of human life, rather than the richness of the economy in which human beings live, which is only a part of it." (Amartya Sen)

Source: HDR 2011.
What do we learn?

HDI and income

« The evidence does cast doubt on whether economywide income growth is instrumental in furthering health and education at low and medium levels of human development. »

Source: HDR 2011.
What do we learn? the case of the US/health

<table>
<thead>
<tr>
<th>Health index (life expectancy)</th>
<th>GDP per capita</th>
<th>HDI index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Switzerland 82.3</td>
<td>1 Norway 47 557</td>
<td>1 Norway 0.943</td>
</tr>
<tr>
<td>2 Australia 81.9</td>
<td>2 United States 43 017</td>
<td>2 Australia 0.929</td>
</tr>
<tr>
<td>3 Sweden 81.4</td>
<td>3 Switzerland 39 924</td>
<td>3 Switzerland 0.910</td>
</tr>
<tr>
<td>4 Norway 81.1</td>
<td>4 Netherlands 36 402</td>
<td>4 Netherlands 0.910</td>
</tr>
<tr>
<td>5 Canada 81.2</td>
<td>5 Sweden 35 837</td>
<td>5 Sweden 0.908</td>
</tr>
<tr>
<td>6 Netherlands 80.7</td>
<td>6 Canada 35 166</td>
<td>6 Canada 0.908</td>
</tr>
<tr>
<td>7 New Zealand 80.7</td>
<td>7 Germany 34 854</td>
<td>7 Ireland 0.908</td>
</tr>
<tr>
<td>8 Ireland 80.6</td>
<td>8 Australia 34 431</td>
<td>8 Germany 0.905</td>
</tr>
<tr>
<td>9 Germany 80.4</td>
<td>9 Ireland 29 322</td>
<td>9 Sweden 0.904</td>
</tr>
<tr>
<td>33 United States 78.5</td>
<td>10 New Zealand 23 737</td>
<td>10 Switzerland 0.903</td>
</tr>
</tbody>
</table>

Source: HDR 2011.
What do we learn?
The case of the US/equity

Source: HDR 2011.

<table>
<thead>
<tr>
<th>HDI rank</th>
<th>Human Development Index (HDI)</th>
<th>Inequality-adjusted HDI</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Value</td>
<td>Value</td>
<td>Overall loss (%)</td>
<td>Change in rank</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>2011</td>
<td>2011</td>
<td>2011</td>
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<tr>
<td>Very High Human Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Norway</td>
<td>0.943</td>
<td>0.890</td>
<td>5.6</td>
<td>0</td>
</tr>
<tr>
<td>2. Australia</td>
<td>0.929</td>
<td>0.856</td>
<td>7.9</td>
<td>0</td>
</tr>
<tr>
<td>3. Netherlands</td>
<td>0.910</td>
<td>0.846</td>
<td>7.0</td>
<td>-1</td>
</tr>
<tr>
<td>4. United States</td>
<td>0.910</td>
<td>0.771</td>
<td>15.3</td>
<td>-19</td>
</tr>
</tbody>
</table>
What we don’t learn:
governance

Figure 2.2: Top movers vary across regions, but bottom movers are concentrated in Africa

Top and bottom movers as measured by deviation from fit, 1970-2010

Note: HDI values in 1970 are on a logarithmic scale.

Source: HDR calculations using data from the HDR database.
What we don’t learn: governance

Source: HDR 2011.
What we don’t learn: happiness

Source: HDR 2011.
GDP and happiness in China

Same period = GDP per capita increased by a factor 3

Source: Easterlin (2010).

Sources: Mean satisfaction from World Values Survey (2005); percent satisfaction from Kahneman and Krueger (2006, 16).
“Better Life” index (OECD, 2011 & 2012)

Source: OECD.
“Better Life” index
(OECD, 2011 & 2012)

Source: OECD.
The “anti-GDP”: the Genuine Progress Indicator

Source: Redefining progress.
“If the GDP is Up, Why is America Down?”

Source: Redefining progress.
2. « Static sustainability »

- Sustainability: dynamic indicators (actually = dynamic, global and constrained by “planetary boundaries”)
- Some indicators refer to sustainability or are taken as measures of sustainability, but they really are static indicators;
- Three examples: ESI/EPI, the Ecological footprint, decoupling indicators.
- One recent innovation in this field: the Nature index (Norway)
The ecological footprint

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>Global Population (billion)</td>
<td>3.1</td>
<td>3.3</td>
<td>3.7</td>
<td>4.1</td>
<td>4.4</td>
<td>4.8</td>
<td>5.3</td>
<td>5.7</td>
<td>6.1</td>
<td>6.5</td>
<td>6.7</td>
</tr>
<tr>
<td>Total Ecological Footprint</td>
<td>2.4</td>
<td>2.5</td>
<td>2.8</td>
<td>2.8</td>
<td>2.8</td>
<td>2.6</td>
<td>2.7</td>
<td>2.6</td>
<td>2.5</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>Cropland Footprint</td>
<td>1.1</td>
<td>1.1</td>
<td>1.0</td>
<td>0.9</td>
<td>0.8</td>
<td>0.8</td>
<td>0.7</td>
<td>0.7</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Grazing Land Footprint</td>
<td>0.4</td>
<td>0.4</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Forest Footprint</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Fishing Ground Footprint</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Carbon Footprint</td>
<td>0.3</td>
<td>0.5</td>
<td>0.9</td>
<td>1.0</td>
<td>1.1</td>
<td>1.1</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Built-up Land</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Total Biocapacity</td>
<td>3.7</td>
<td>3.5</td>
<td>3.1</td>
<td>2.9</td>
<td>2.6</td>
<td>2.4</td>
<td>2.3</td>
<td>2.1</td>
<td>2.0</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Ecological Footprint to Biocapacity ratio</td>
<td>0.63</td>
<td>0.73</td>
<td>0.88</td>
<td>0.97</td>
<td>1.06</td>
<td>1.07</td>
<td>1.18</td>
<td>1.24</td>
<td>1.29</td>
<td>1.45</td>
<td>1.51</td>
</tr>
</tbody>
</table>

EF and carbon footprint

Environmental Sustainability Index (ESI)...

The components summarize the indicator values in 5 thematic categories.

<table>
<thead>
<tr>
<th>Component</th>
<th>Logic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Systems</td>
<td>A country is more likely to be environmentally sustainable to the extent that its vital environmental systems are maintained at healthy levels, and to the extent to which levels are improving rather than deteriorating.</td>
</tr>
<tr>
<td>Reducing Environmental Stresses</td>
<td>A country is more likely to be environmentally sustainable if the levels of anthropogenic stress are low enough to engender no demonstrable harm to its environmental systems.</td>
</tr>
<tr>
<td>Reducing Human Vulnerability</td>
<td>A country is more likely to be environmentally sustainable to the extent that people and social systems are not vulnerable to environmental disturbances that affect basic human wellbeing; becoming less vulnerable is a sign that a society is on a track to greater sustainability.</td>
</tr>
<tr>
<td>Social and Institutional Capacity</td>
<td>A country is more likely to be environmentally sustainable to the extent that it has in place institutions and underlying social patterns of skills, attitudes, and networks that foster effective responses to environmental challenges.</td>
</tr>
<tr>
<td>Global Stewardship</td>
<td>A country is more likely to be environmentally sustainable if it cooperates with other countries to manage common environmental problems, and if it reduces negative transboundary environmental impacts on other countries to levels that cause no serious harm.</td>
</tr>
</tbody>
</table>

Source: ESI.
... and EPI

Environmental Performance Index Framework

- **Index**: EPI
- **Objectives**:
  - Environmental Health
  - Ecosystem Vitality
- **Policy Categories**:
  - Environmental Burden of Disease
    - Water (effects on humans)
    - Air Pollution (effects on humans)
    - Air Pollution (effects on ecosystems)
    - Water (effects on ecosystems)
  - Biodiversity & Habitat
  - Forestry
  - Fisheries
  - Agriculture
  - Climate Change
- **Indicators**:
  - Environmental Burden of Disease
  - Access to Drinking Water
  - Access to Sanitation
  - Urban Particulates
  - Indoor Air Pollution
  - Sulfur Dioxide Emissions
  - Nitrogen Oxide Emissions
  - Volatile Organic Compound Emissions
  - Ozone Exceedance
  - Water Quality Index
  - Water Stress
  - Water Scarcity Index
  - Biome Protection
  - Critical Habitat Protection
  - Marine Protected Areas
  - Growing Stock
  - Forest Cover
  - Marine Trophic Index
  - Trawling Intensity
  - Pesticide Regulation
  - Agricultural Water Intensity
  - Agricultural Subsidies
  - Greenhouse Gas Emissions/Oepita
  - Electricity Carbon Intensity
  - Industrial Carbon Intensity

Figure 1.1 The state of biological diversity in the major ecosystems, as measured by the Nature Index (y axis) and the proportion of the area taken up by the major ecosystems (x axis). The total area includes coastal waters out to 1 nautical mile beyond the baseline, fresh water and the entire land area.

Source: Norwegian Directorate for Nature Management
Nature Index

Percent change in Nature Index from 1990-2010

Source: Norwegian Directorate for Nature Management
The decoupling framework

Source: International Resource Panel.
Resource decoupling (relative) in the EU

Material productivity (= resource productivity) = the amount of GDP generated per unit of material consumed, i.e. GDP / DMC in euro per kg.

Domestic material consumption, abbreviated as DMC, measures the total amount of materials directly used by an economy and is defined as the annual quantity of raw materials extracted from the domestic territory, plus all physical imports minus all physical exports.

Source: European Commission.

The development of resource productivity = “decoupling” between the use of natural resources and economic growth.
Impact decoupling (CO₂ emissions) for OECD Countries

Source: OECD
3. Comprehensive wealth: The (real) wealth of Nations

<table>
<thead>
<tr>
<th>Income Group</th>
<th>2005</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Wealth (US$ billions)</td>
<td>Per Capita Wealth (US$)</td>
<td>Intangible Capital (%)</td>
<td>Produced Capital (%)</td>
<td>Natural Capital (%)</td>
</tr>
<tr>
<td>Low income</td>
<td>3,597</td>
<td>6,138</td>
<td>57</td>
<td>13</td>
<td>30</td>
</tr>
<tr>
<td>Lower middle income</td>
<td>58,023</td>
<td>16,903</td>
<td>51</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td>Upper middle income</td>
<td>47,183</td>
<td>81,354</td>
<td>69</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>High income OECD</td>
<td>551,964</td>
<td>588,315</td>
<td>81</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>World</td>
<td>673,593</td>
<td>120,475</td>
<td>77</td>
<td>18</td>
<td>5</td>
</tr>
</tbody>
</table>

Comprehensive wealth approach: Adjusted net savings (ANS)

ANS = «the true rate of savings in an economy after taking into account investment in human capital, depletion of natural resources and damage caused by pollution»

GDP per capita and ANS

ANS: What do we learn?

Figure 5  ANS for Botswana, Namibia, Norway, and Saudi Arabia, 1990–2008
Source: UNDP web site.

IWI: the inclusive wealth of nations (2012)

FIGURE 3
Composition of the productive base of the economy. Average from 1990-2008.

Source: UN.
GDP and IWI

**GROSS DOMESTIC PRODUCT per capita**
- 9.6  China
- 4.5  India
- 4.1  Chile
- 2.5  Nigeria
- 2.3  Norway
- 2.2  Australia
- 2.2  U.K.
- 1.8  Ecuador
- 1.8  U.S.
- 1.7  Colombia

**INCLUSIVE WEALTH INDEX per capita**
- 2.1  China
- 1.8  Germany
- 1.4  France
- 1.2  Chile
- 0.9  Brazil
- 0.9  India
- 0.9  Japan
- 0.9  U.K.
- 0.7  Norway
- 0.7  U.S.

Source: UN.
IWI and "weak" sustainability

Source: The Economist, July 2012.
IWI and Natural Capital

Source: UN.
Measures and policies

- The case of China and “green GDP” (2004-2012): coming to terms with reality;

- The case of Bhutan and happiness (2008-2010): Is democracy having the right to be unhappy?

- Building new measures for policy: the need for democratic process and policy purpose.