# Your 10-Step Pocket Guide
## to Composite Indicators & Scoreboards

STEP 01

# Define the concept to be measured

- Clearly define the **objectives** and the **end-users** of the index
- Map **existing literature**, indicator frameworks and definitions and assess the added-value of your index
- Involve **stakeholders**, e.g. via workshops
- Structure the concept into **framework** of dimensions

- *Valid both for composite indicators and scoreboards*

## COIN Tips

*You may need to spend up to 2/3 of the overall time in defining the conceptual framework and the indicators.*

*5-7 indicators per dimension is a good practice. A minimum of 3 indicators by dimension is acceptable.*

# Select the indicators

STEP 02

**COIN Tips**

*Aim for at least 65% of data coverage across each indicator and each country.*

- Assemble a pool of candidate indicators from the **literature review**
- Choose indicators based on **criteria** such as: relevance, data availability/reliability and credibility
- Keep track of all indicator decisions and characteristics in a **summary table**, e.g. coverage, type, descriptive statistics, source and year
- **Scale indicators** by an appropriate size measure to have an objective comparison across countries, e.g. population, GDP, etc.

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STEP 03

# Analyse and treat the data, where necessary

- **Visualise the distribution** of each indicator using histograms and scatter-plots
- Check for **missing data** and carefully decide whether or not to impute the data, and which method to use
- Discuss and treat **outliers**, if needed, to avoid that they become unintended benchmarks

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## COIN Tips

*Plot first and consider indicators for outlier treatment if:*

*1) absolute skewness > 2.0 and kurtosis > 3.5 or,*

*2) kurtosis is very high > 10*

*Winsorisation is one way to treat data, in which outliers are assigned the next highest/lowest score.*

# Bring all indicators onto a common scale

STEP 04

**COIN Tips**

*A commonly-adopted normalisation method is the Min-Max approach, which rescales indicators onto an identical range (0-100) by subtracting the minimum value and dividing by the range of the indicator values.*

- Make **directional adjustments**, so that higher indicator scores correspond to better performance in the concept being measured
- Select a suitable **normalisation** method that respects the conceptual framework and the data properties

STEP 05

# Weight the indicators and dimensions

- Select a suitable **weighting method** which aligns with the goals of the index
- If appropriate, use **expert elicitation** to understand the relative importance of indicators and dimensions
- Consider whether **correlations** between indicators should be accounted for **in the weights**
- Keep in mind the ability to **communicate the weighting scheme** to your audience

## COIN Tips

*Popular weigthing methods include equal weighting, factor analysis, derived weights, data envelopment analysis, expert opinion and the budget allocation method.*

# Aggregate the indicators and dimensions

STEP 06

**COIN Tips**

*Popular aggregation methods include the arithmetic average, geometric average, Borda and Copeland.*

- Consider whether **compensability among indicators** should be allowed, i.e. a deficit in one indicator can be compensated by a surplus in another
- Consider **up to which level to aggregate**
- Select a **suitable aggregation** method that respects the goals of the index
- Keep in mind the **ability to communicate the aggregation method** to your audience

STEP 07

# Assess the statistical and conceptual coherence

- Check **correlations between aggregations and the underlying indicators** - are some over or under-represented in the aggregate scores?
- Assess whether **statistical properties can be improved** by moving indicators under different dimensions or merging/splitting dimensions
- Check whether a **bias** has been introduced in the composite indicator, e.g. a strong correlation with population (>0.6) or GDP

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## COIN Tips

*Check whether indicators:*

- *Dominate the framework: correlation > 0.95*
- *Are under-represented: -0.3 < correlation <0.3*
- *Are negatively related to the composite indicator: correlation < -0.3*

# Assess the impact of uncertainties

STEP 08

**COIN Tips**

*Provide the full ranks and index scores with confidence intervals in order to better appreciate the robustness of the ranks/scores to the modelling choices.*

- Identify the **main uncertainties** underlying the index, e.g. methodological choices, indicator selection, etc.
- Assess the **impact of the uncertainties** on the scores or ranks. Use sensitivity analysis to see which assumptions cause the most uncertainty
- Explain why certain **countries notably improve or deteriorate their relative position** given changes in the assumptions

STEP 09

# Make sense of the data

- Dig into the data to reveal **narratives and stories** for your audience. What question did you set out to answer?
- **Decompose performance** at the dimension or indicator level to reveal strengths and limitations for each country or groups of countries
- **Correlate the index with relevant measurable phenomena** and explain similarities or differences
- Don't assume causality from correlation. Perform **causality tests** (if time series data is available)

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## COIN Tips

*It is your role to find stories in the numbers. The tools don't know what those stories are. Your data visualisation tools will be more effective if combined with powerful narratives.*

# Present the data visually

STEP 10

**COIN Tips**

*The best data graphics are usually the simplest. Well-designed graphics should focus on showing the findings clearly, be easy to read and decode the data.*

*A picture is worth a thousand words!*

- Focus first on what your **key messages** are and to whom you are aiming to communicate them
- Select the **visualisation tools** which clearly communicate the messages without hiding vital information
- **Avoid over-complicated visuals** and excessive cognitive load

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**Composite indicators and scoreboards should be developed sensibly and used responsibly**

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