Your 10-Step Pocket Guide
to Composite Indicators & Scoreboards
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

**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.

**Valid both for composite indicators and scoreboards**
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.

**COIN Tips**

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

**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.
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.

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

**COIN Tips**

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

**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

- Valid both for composite indicators and scoreboards
Assess the impact of uncertainties

▸ 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.

**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.
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.”

**Valid both for composite indicators and scoreboards**
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.

**Valid both for composite indicators and scoreboards**

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