

PATHWAY 2: DEVELOPING COMPOSITE INDICATORS

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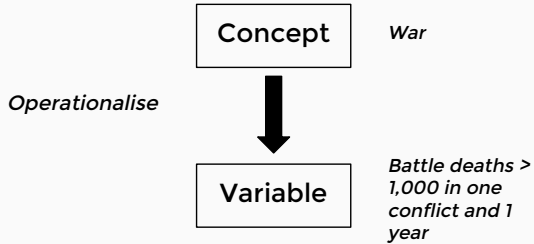
AIMS

- What are composite indicators and who uses them?
- Defining the construct and what can be observed.
- Making Composite Indicators
 - What data to include?
 - How to normalise the variables?
 - How to weight the variables?
 - Assessing validity (introduction)
- Pros, cons, and pitfalls
- Survey examples

WHAT ARE COMPOSITE INDICATORS

Last semester, we learned about concepts and variables.

- *Concept*: A phenomenon (e.g. poverty, democracy, human development, trust in institutions) we are interested in studying.
- *Variable*: Observable characteristic of a unit (e.g. person, city, country) that operationalises the concept.



WHEN ONE VARIABLE IS NOT ENOUGH

Frequently in social science we are interested in complex concepts that cannot be operationalised with one variable.

Instead, they likely involve some combination of variables.

For example, what is democracy?

Why should we care about measuring concepts well?

If we don't have good measures of our concepts, we can't know how one thing effects another (relationships *between* concepts) and how to improve the social world.

DEFINING THE CONSTRUCT

WHAT DATA TO INCLUDE

NORMALISE VARIABLES

Observable variables are often on different scales.

For example, *life expectancy at birth* is in years ranging from 0 to > 100 and *GNI per capita* is in US dollars starting from > 300.

Obviously, adding these two variables together would weight GNI more than life expectancy.

WEIGHTING VARIABLES

Once you have your normalised variables ($l_{c,t}$), then you need to consider how to combine them.

Things to consider:

- **Weighting:** how important are each individual variables to the composite?
- What **scale** do you want the indicator to be on?

If you simply add all of the variables together, you are implicitly assuming that they have an equal weight of 1.

$$Cl_{c,t} = \sum I_{c,t} * 1 \quad (1)$$

Sometimes this makes sense: e.g. economic activity is often measured in the same currency.

Sometimes the concept we are measuring might be discrete. E.g. you are in a financial crisis or not in a financial crisis.

So, you might set a **threshold**, a point past which a unit goes from having the characteristic to not having the characteristics.

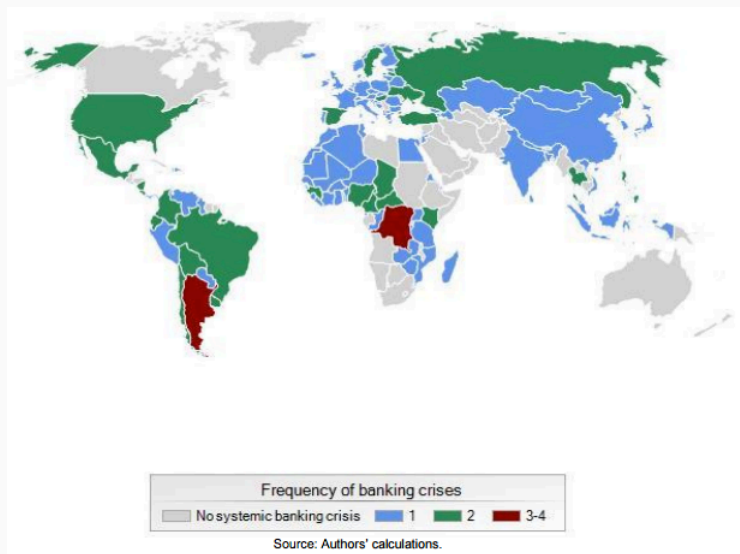
Laeven and Valencia (2013) determine a country has crossed a financial crisis threshold if:

- There is 'significant distress' in a country's financial system.

and

- At least three of six policy responses are used (e.g. bank holidays, bank nationalisations).

LAEVEN & VALENCIA BANKING CRISES (1970-2011)



WHAT ARE WE MEASURING?

Once you have a composite indicator, your work is far from done.

You need to conduct numerous tests to determine if your indicator is a valid measure of the concept you are trying to measure.

PROS, CONS, AND PITFALLS

Composite indicators are popularly used to rank units (e.g. cities, countries)

[ADD IMAGE]

However, we need to remember that our indicators are **estimates** of what we want to measure.

We are **uncertain** about how well our indicators capture reality.

Uncertainty can be caused by at least:

- Error in our construct (i.e. including or omitting important variables)
- Measurement error in our raw data $x_{C,t}$
- Error in our weighting.