Doctoral Study Programme „Statistics“

Challenges of Operationalisation, Conceptualisation and Measurement in Economics and Business

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Agenda

- Brief introduction to economics and business.
- Characteristics of research in economics and business.
- Concepts and definitions.
- Propositions and hypotheses.
- Theories and models.
- Approaches to measurement.
- Properties of good measurement.
- Showcase: Measurement of happiness.

Brief Introduction to Economics and Business

Key Theoretical Areas

Microeconomics - study of behavior of individual economic agents – companies (firms) and households.

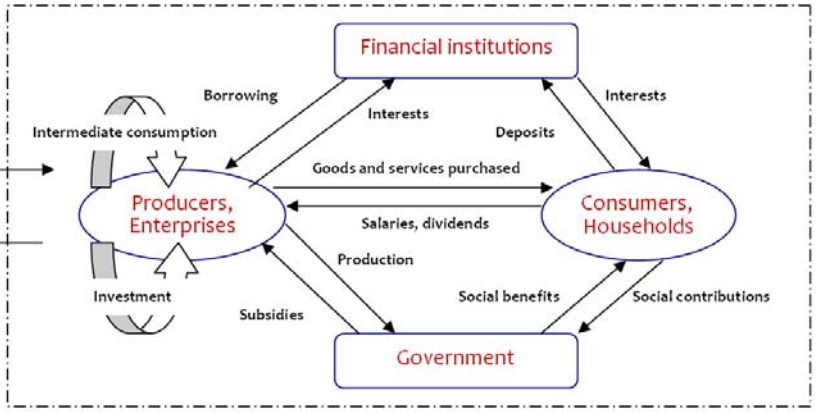
Macroeconomics - study of *aggregate* measures of the economy - aggregate income, consumption, investment, the overall level of prices …

Note: *Aggregate behavior* refers to the behavior of all companies (firms) and households together.

A More Comprehensive Definition of Macroeconomics

Macroeconomics is the study of the **structure** and **performance** of national economies and of the policies that governments use to try to affect economic performance.

National Economy Circuit



Source: Eurostat (2013). *Building the System of National Accounts – context*. Retrieved from http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Building_the_System_of_National_Accounts_-_context

Issues Addressed by Economists

- What determines a nation's long-run economic growth?
- What causes a nation's economic activity to fluctuate?
- What causes unemployment?
- What causes prices to rise?
- How does being a part of a global economic system affect nations' economies?
- Can government policies be used to improve economic performance?

Issues Addressed by Economists in a Business Setting

- How to optimize the allocation of scarce financial and human resources?
- Which customer segments are most profitable?
- Which demographic trends have to be taken into account when designing our next advertising campaign?
- …

What Do Analysts in Economics and Business Do?

- Research.
- Analysis.
- Forecasting.

For all these processes data have to be collected and processed.

Three Analytical Levels

Economy (→ PEST Analysis)

- make better sense of the world, the society, the business environment

Industry (→ Benchmarking)

- make better sense of an industry, its competition, its buyers and suppliers

Individual (Business) Organization (→ SWOT Analysis)

- make better business decisions by:
  - ❑ summarizing business data
  - ❑ drawing conclusions from business data
  - ❑ making reliable forecasts about business activities
  - ❑ improving business processes

Data Sources for the Three Analytical Levels ?

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Characteristics of Research in Economics and Business

Paradigms

- Positivistic → objective logic.
- Interpretivistic → social constructivism.
- Realistic → independence from subjective opinions.
- **Pragmatic**.

Characteristics of Research in Economics and Business - 1

Data typologies: e.g. ‚hard' (facts) vs. ‚soft' (attitudes)

Methods of primary data collection ranked according to their frequency of use:

- Questionnaire survey.
- Interview.
- Observation.
- Experiments.

Specifics:

- In econometrics?
- In managerial theory and practice?

Characteristics of Research in Economics and Business - 2

Case study research

Concepts and Definitions

What is a Concept?

Concept is:

- A generalised idea about a class of objects.
- An abstraction of reality that is the basic unit for theory development.
- In short: **a phenomenon that usually cannot be measured directly**.

Typology of Concepts in Economics and Business

- **Group 1:** concepts for which the **general agreement** on the mode of operationalisation exists.
- **Group 2:** concepts for which the **political agreement** on the mode of operationalisation exists.
- **Group 3:** concepts for which **no agreement** on the mode of operationalisation exists.

Basic Functions of Concepts

- Provide common language for scientists.
- Give scientists a perspective - a way of looking at phenomena.
- Allow scientists to classify their experiences and to generalise from them.
- Define contents and attributes of a theory.

Ladder of Abstractions for Concepts

Abstract Level
(concept exists as an idea)

.
.
.

Empirical Level
(concept is verifiable
by experience or measurement in the research process)

Important Information

Some concepts are vague - **precise definitions** needed:

- conceptual definitions (based on the use of less abstract concepts)
- operational definitions (actions that confirm the existence of a phenomenon)

How can we empirically verify concepts?

→ By using **variables**.

In-Class Discussion

How can we operationalize the following concepts ?

- population ageing
- successful company
- customer loyalty
- quality of life

Propositions and Hypotheses

What is a Proposition?

- A statement concerned with the **relationship** among concepts.
- It explains the **logical linkage** among the given concepts.

What is a Hypothesis?

- A proposition that is empirically testable.
- A statement concerned with the **relations** among variables (their direction and magnitude).

Illustration on the Basis of the Ladder of Abstraction

Abstract Level
(proposition linking two or more concepts)

.
.
.

Empirical Level
(hypothesis linking two or more variables)

The Insurance Salesman Example

Proposition:

Reinforcement will increase effort.

Hypothesis:

Awarding financial bonus for sales volume above the prescribed quota will result in increased number of interactions with customers (e.g. e-mails, phone calls, visits at home, etc.).

Theories and Models

What is a Theory?

A set of logically linked propositions which can be presented in the form of a **model** (= a likeness of reality):

- descriptively
- mathematically
- graphically

Typology of Theories

- **Grand theories** (e.g. by Darwin, Newton, Einstein):
  → change the way we think.
- **Middle-range theories** (e.g. by Maslow):
  → reinforce the way we think.
- **Substantive theories**:
  → restricted to a particular setting, time, population or problem.

Two Basic Approaches to Theory Generation

(1) Deductive reasoning

general → specific

Develop an idea first – then go and empirically verify it.

(2) Inductive reasoning

specific → general

Investigate a phenomenon first – then go and develop a valid theoretical framework.

Deduction: Theory Testing

<u>Emphasis given:</u>

- scientific principles (→ a highly structured approach)
- moving from theory to data (→ problem → proposition → hypothesis)
- the need to explain causal relationships between variables
- collection of predominantly quantitative data
- sufficient sample size to generalise conclusions for the population as a whole

Induction: Theory Building

Emphasis given:

- flexible structure which permits changes of research emphasis as the research progresses
- gaining understanding of the meanings humans attach to events
- gaining understanding of the research context
- collection of predominantly qualitative data
- less concern with the need to generalise, more emphasis on solving the problems at hand

Your Research Can Be ...

- **Descriptive** - portraying an accurate profile of persons, events or situations.
- **Exploratory** - clarifying issues, obtaining better understanding of a given phenomenon in the relevant context.
- **Explanatory** - establishing causal relationships between variables.

Time Horizons: Two Perspectives

- The snapshot perspective: **cross-sectional approach**.
- The diary perspective: **longitudinal approach**.

Approaches to Measurement

Facts

- Most phenomena in economics and business are concepts from Groups 2 and 3.
- Consequently, coexisting approaches to measurement for each of them can be applied.
- Many measurement scales developed for measurement of the same economic or business phenomenon are therefore **not directly comparable**.

What kind of choices does the researcher face?

Simple Example

Our task is to measure **the height of a boy named Janezek**.

Question: How can we do that?

A Slightly More Complex Example

Our task is to measure **unemployment in Slovenia**.

Question: How can we do that?

A Very Complex Example - 1

Our task is to analyze **service quality**.

Question: How can we do that?

A Very Complex Example - 2

Our task is to analyze the **political instability in the member countries of the European Union**.

Question: How can we do that?

How, Then, Do We Define the Measurement System?

Starting point: **a well-defined research problem**.

That calls for:

- concepts
- conceptual definitions
- operational definitions
- variables

Illustrative Example (1)

Concept:
Customer loyalty

Conceptual definition:
Customer frequently purschases at the POS of our company.

Operational definition:
Frequency and volume of purchase of the customer at the POS of our company in the last quarter are high.

Variables:
- total number of purchases of the customer at the POS of our company in the last quarter
- total value of of purchases of the customer at the POS of our company in the last quarter
- average value of of purchases of the customer at the POS of our company in the last quarter
- number of visited POS of our company in the last quarter
- …

Illustrative Example (2)

Concept:
Job challenge

Conceptual definition:
Worker's desire for stimulation and challenge in his/her job as well as the ability to exercise skills in his/her job.

Operational definition:
How true are the following statements about your job:
very true, somewhat true, not very true, or not true at all?

Variables:
The work is interesting.
I have an opportunity to develop my own special abilities.
I am given a chance to do the things I do best.

Properties of Good Measurement

Properties of Good Measurement

1. Reliability.
2. Validity.
3. Sensitivity.
4. Generalisability.
5. Practicality.

1. Reliability

- The degree to which measures are free from errors and therefore yield consistent results.
- In other words: when the outcome of the measurement instrument is **reproducible**, the measurement instrument is reliable.

Compare reliability of:

- Floor surface measurement.
- Measurement of population attitudes towards opening hours of local stores.
- Measurement of population attitudes towards storage of radioactive waste in their immediate environment.

Two Underlying Dimensions of Reliability

(1) Repeatability:

Administering of the same scale or measure to the same respondents at two separate points in time (→ "test-retest").

Problems: respondents **sensitised** in the retest phase + the effects of **maturity**.

(2) Internal consistency:

Use of similar (but not identical) questions should produce highly correlated results.

2. Validity

The ability of a scale or measurement instrument to measure what is intended to measure.

Prerequsites:

- good problem definition
- logical operationalisation

Example: testing for knowledge - are we testing for understanding or the ability to memorise definitions and formulas?

Validity: Typology

- **Face or content validity** - professional agreement reached that a scale accurately measures what it is supposed to measure.
- **Criterion or convergent validity** - the ability of a newly proposed measure to correlate with other (traditional) measures of the same phenomenon.
- **Construct validity** - the ability of a measure to confirm a network of related hypotheses generated from a theory based on the concepts.

  In other words: empirical evidence is consistent with the theoretical logic underlying the concepts.

Link Between Reliability and Validity

Fact:

Reliability is a prerequisite for validity …

… **but:** reliable results do not guarantee the validity of measurement!

Illustrative example ?

3. Sensitivity

The ability of a scale or measurement instrument to accurately measure **variability** in stimuli or responses.

Question:
How can sensitivity be increased?

4. Generalisability

Allows for the use of research results
beyond the immediate realm of research.

Illustrative examples ?

5. Practicality

Allows us to carry out the research process
in a pragmatic manner.

Three components:

- Efficiency: the minimax principle
- Relevance: simplicity of execution speeds up the process
- Availability: secondary data !!!

Showcase: Measurement of Happiness

How Can I Find Out How Well You Are?

- **Indirectly**

  (1) Look at your wealth/income
  (2) Look at your capabilities or your quality of life indicators

- **(More) Directly**

  (3) Observe your behaviour
  (4) Scan your brain
  (5) Ask you

(1) Look at Your Income

- Income is an indicator of ability to satisfy preferences (and thereby make yourself happy)
- Used by some economists & politicians as an indicator of 'national progress'
- Benefits: Easy to calculate and compare on large scale
- Problems … ?

Margin of Discontent

= gap between what we have and what we want

<u>Two solutions:</u>

1) 'Sages' solution:
   - "Give up wanting" – Hard & boring?

2) 'Economic growth' solution:
   - "People satisfy their wants by increasing their possessions, thus becoming happier"

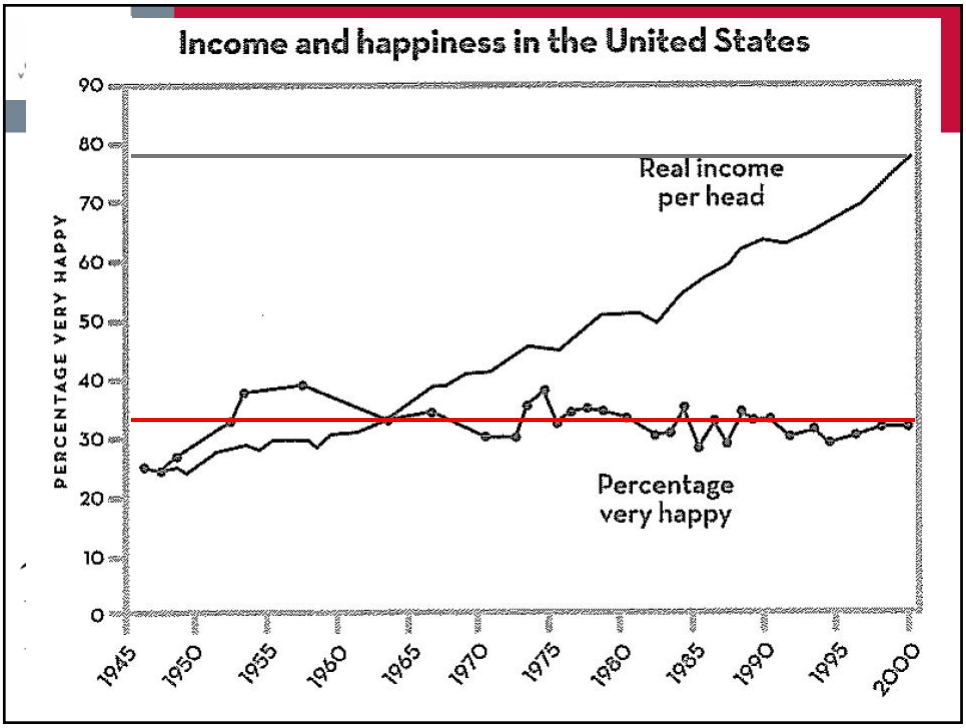
Does Money Make Us Happy?

Two postulates:

1) Reducing the margin of discontent makes people happier
2) Economic growth helps consumers to reduce their margin of discontent

If 1. and 2. are both true, then why have we gotten richer… but not happier?

Empirical evidence?



Further Empirical Evidence ?

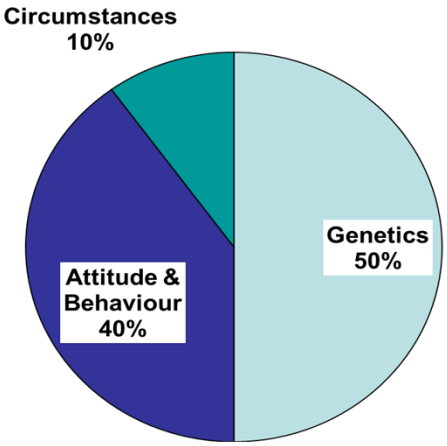
- Lottery winners return to pretty much the same level of happiness after 1 year (verified)
- Materialistic people:
  the more they have
  The more they *want* and
  The more they think they *need*
- Unless you are distinctly materialistic person, more money makes very little difference to **your** happiness – much less than:
  - A loving relationship
  - Volunteering
  - A great circle of friends
  - A rewarding study / job

  …

(2) Look at Your Capabilities / QoL Indicators

- Used by:
  - ✓ Some economists & politicians
  - ✓ Often encouraged by NGOs
- Income, access to education, healthcare, clean environment, employment, political freedoms etc.
- Benefits: Not too hard to calculate and compare on a large scale
- Problems …? → *People from all walks of life report themselves as happy, even those whose circumstances look dire to us*

Determinants of Happiness



Discussion

- What is more important, freedom, education, or happiness?
- Which is better, a long life of medium happiness or a medium life of great happiness?
- Should we focus on genetic technology and cognitive behavioural therapy instead of circumstances?

(3) Observe Your Behaviour

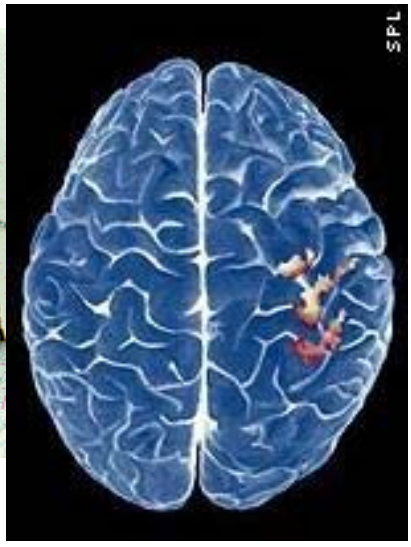
- Used by:
  - ✓ A few academics
  - ✓ Just about all of us!
- By observing body language and behaviour we can tell how happy someone is
- Benefits: easy to do, especially with people you know well
- Problems: impractical on large scale and to a certain extent subjective

(4) Scan Your Brain

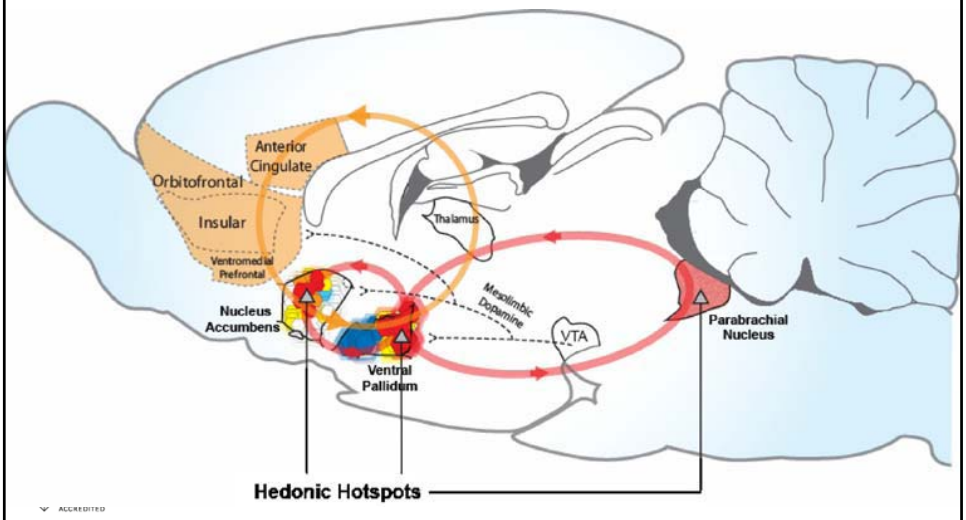
- Used by:
  - ✓ A few academics
- Activity in specific areas of the brain are measured and compared to the other direct measures of happiness
- Benefits: becoming increasingly accurate
- Problems: very impractical on large scale and still mysterious

Cute Baby = Left Side

Deformed Baby = Right Side



Hedonic Hotspots in Our Brain



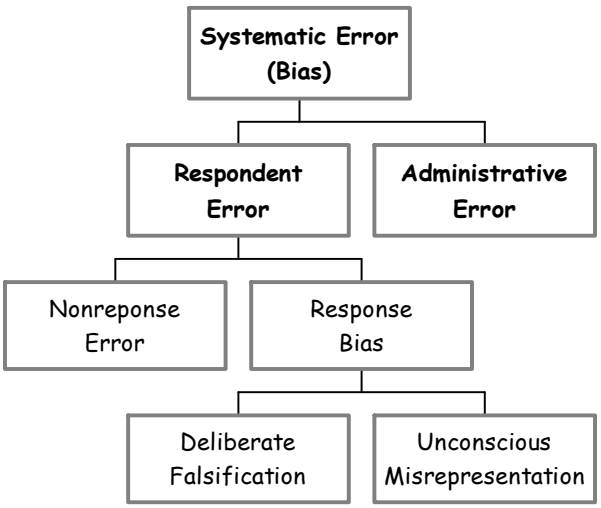
Discussion

- If happiness has a biological cause in the brain, then we are able to influence it with drugs, surgery, bionics etc… but should we?
- If our brains show equal 'happiness activity', does that mean that we are equally happy? How can we know this?

(5) Ask You → Survey Research

- Used by:
  - ✓ Psychologists
  - ✓ Economists
- You think about and answer a question regarding your happiness. After all, who could be better than you at judging how happy you are?
- Benefits: Not too hard to calculate and (possibly) compare on large scale
- Problems: typical for survey research

Errors in Survey Research



Types of Nonresponse

Unit nonresponse:

- People couldn't be reached (→ "no contacts").
- People could be reached but declined to participate in a survey (→ "no respondents").

Item nonresponse:

- People decided to participate in a survey but declined to give answers to several of the questions.

Respondent Errors

Self-selection bias.

Response bias:

- Auspices bias.
- Acquiescence bias.
- Extremity bias.
- Recall bias.
- Prestige bias.
- Social desirability bias.

Administrative Errors

- Sample selection errors.
- Interviewer errors.
- Interviewer cheating.
- Data processing errors.

Note: Many interviewer errors are a direct consequence of poor interviewer training!

3 Types of Questions I Can Ask You (3 Levels of Happiness)

1) How are you feeling right now (from 1 to 7)?
   → Introspection
   → Mood: pleasure, joy … vs. anger, fear, sadness, disgust, pain …

2) All things considered, how happy are you these days (from 1 to 7)?
   → Introspection + comparative judgement
   → Total Net Level 1 Happiness + Judgement about Feelings, Satisfaction and Well-Being

3) On the whole, how good do you think your life is (from 1 to 7)?
   → Introspection + comparative judgement +
   + relative position to conception of 'the good life'
   → Potential Fullfilment and Quality of Life
   → Might be independent of Level 1 and/or Level 2 Happiness

Happiness 'Continuum'

Level 1
- Momentary feelings
- Mood
- Pleasure or joy
- Not suffering

Level 2
- Judgements about feelings
- Net level 1 happiness
- Well-being
- Satisfaction

Level 3
- Holistic evaluation of value and quality of life
- Needn't include happiness
- Focus of academic research in ‚happynomics'

More emotional

More cognitive

Economics of Happiness

Bruno S. Frey

https://www.bsfrey.ch/

The World Database of Happiness

http://worlddatabaseofhappiness.eur.nl/

Happiest Places on Earth ?

	Country	Score
1.	Costa Rica	8.50
2.	Denmark	8.34
3.	Puerto Rico	8.32
4.	Iceland	8.15
5.	Switzerland	7.99
6.	Canada	7.97
7.	Finland	7.90
8.	Mexico	7.87
9.	Norway	7.82
10.	Sweden	7.80

Source: World Database of Happiness (2010).

Why are the Danes so Happy?

For past 30 years research has consistently shown that Danes tend to be happier than the rest of the world (Inglehart & Klingleman, 2000).

- Welfare state
- High tax rates
  people could pay
  between 50 and 70% tax
- Social equality

World Database of Happiness (2010) vs. World Happiness Report (2024)

Gross National Happiness

- Gross National Happiness (GNH) is an alternative to the Gross Domestic Product (GDP) as a measure of progress within a country
- Basic premise: increased wealth isn't always an indicator of well-being, happiness or progress

Subjective Well-Being Measurement in Europe

By whom?

34 surveys reviewed

22 by official NSIs

5 by other official bodies

2 by Eurostat

2 by other EU agencies

2 by academic institutes

1 by UNECE

Type of survey?

- 10 health
- **8 well-being or quality of life**
- 5 general social
- **2 perceptions**
- 5 material conditions
- **1 environmental**
- 2 household

National Accounts of Well-Being

http://neweconomics.org/2009/01/national-accounts-wellbeing/

Nicolas Sarkozy

Declared measurement of happiness a priority in 2008

↓

The so-called Stiglitz Commission established

↓

Output = the Stiglitz Commission Report

David Cameron

“It's time we admitted that there's more to life than money and it's time we focused not just on GDP but on GWB – General Well-Being. Wellbeing can't be measured by money or traded in markets. It's about the beauty of our surroundings, the quality of our culture and, above all, the strength of our relationships. Improving our society's sense of wellbeing is, I believe, the central political challenge of our times."

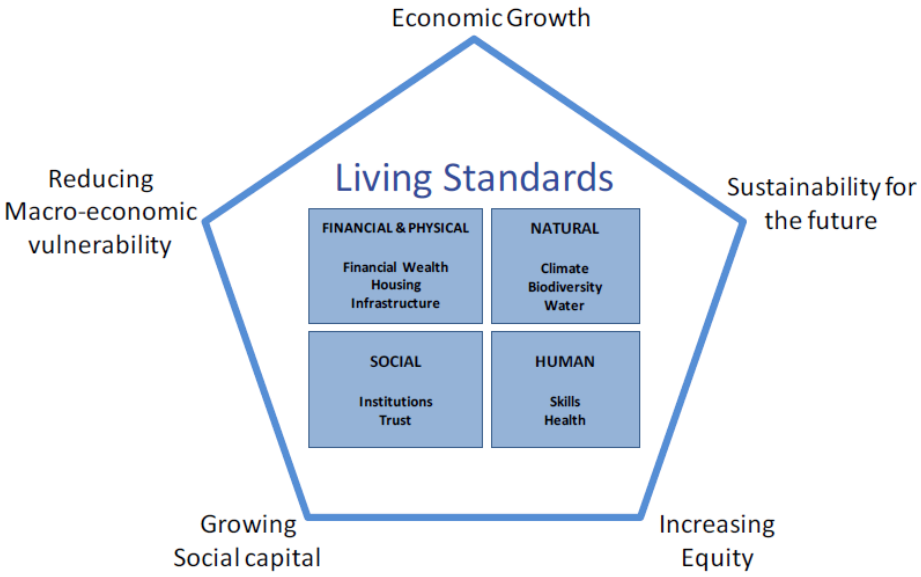
Prepandemic Discussion Example 1: **How should governments tackle unemployment?**

- Raise taxes in order to finance public sector jobs?
- Make firing more difficult from the legal perspective?

Prepandemic Discussion Example 2: **How should governments tackle daily migrations?**

- Shorten the working week length?
- Promote / subsidize home office practices?
- Promote / subsidize virtual jobs?

Prepandemic Discussion Example 3: **How should governments tackle the standard of living issues?**



What Needs to be Analysed?

STOCKS	Financial & Physical	Human	Social & Cultural	Natural
Examples	Financial wealth	Population	Institutions	Usable land
	Housing	Mental health	Harmony	Climate
	Transport	Physical health	Cultural identity	Air & water
	Systems for economic exchange	Skills	Art	Pristine environment
	Technological infrastructure	Knowledge	Permanent accessible knowledge	Raw materials (timber, oil, etc.)

Stocks and flows affect each other

FLOWS	Financial & Physical	Human	Social & Cultural	Natural
Examples	Income	Employment	Freedom	Amenities
	Consumption	Leisure	Security	Environmental services
	Production	Education	Crime	
	In-kind services	Subjective wellbeing	Trust	

Instead of Conclusion

Well-Being of Europeans:
https://www.eurofound.europa.eu/en/topic/subjective-well-being

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Challenges of Operationalisation, Conceptualisation and Measurement in Economics and Business

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