SOCIAL DISCOUNT RATE

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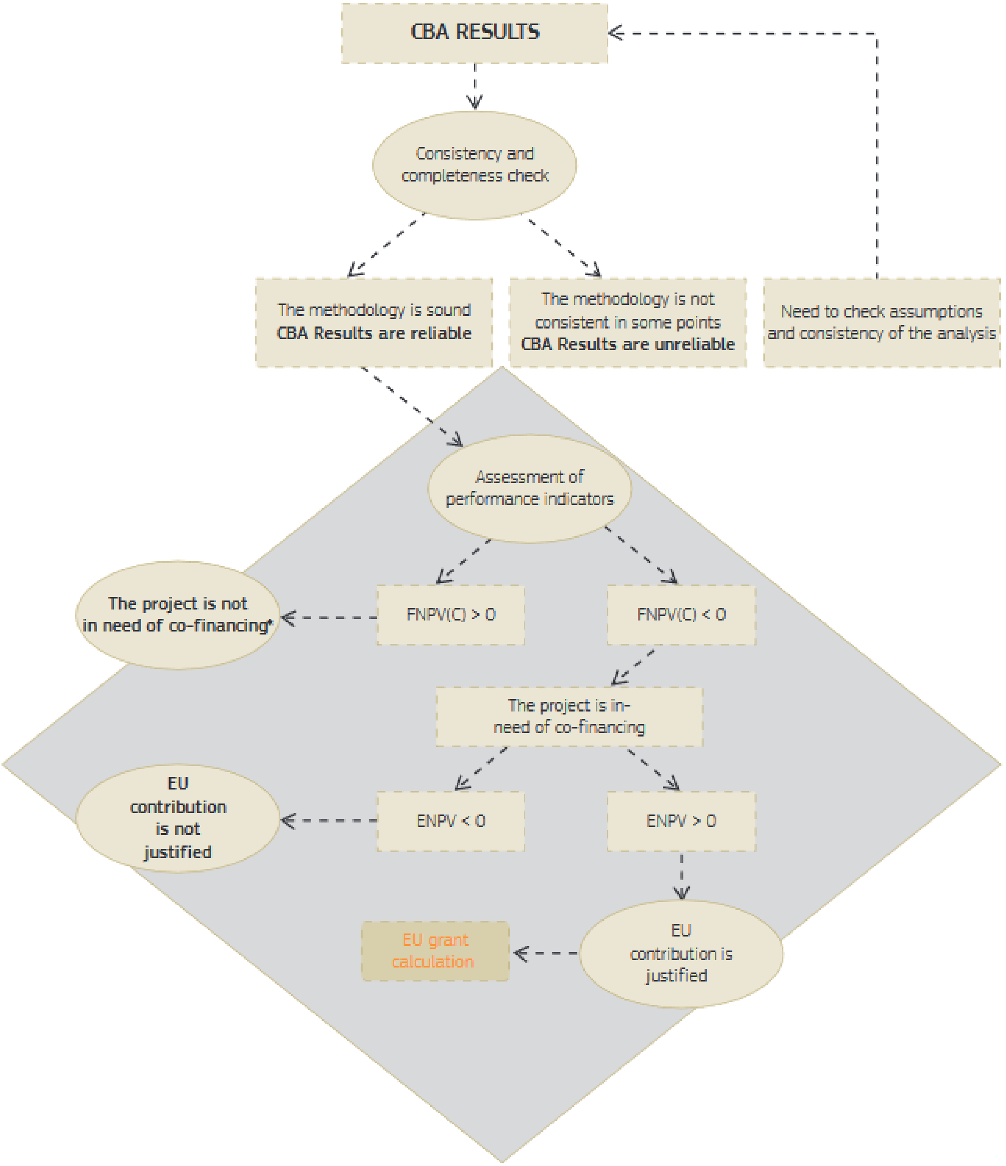
THE SIGNIFICANCE OF SOCIAL DISCOUNT RATE

- Economic cost benefit analysis is mandatory in relation to social project appraisal in EU countries, but should be used on other high scale national projects, too.
- Whereas a financial cost-benefit analysis builds on actual (financial) prices, an economic cost-benefit analysis integrates the viewpoint of society as a whole
- the choice of discount rate determines which long-term projects appear to be profitable
- In economic cost benefit analysis we use social discount rate instead of market doscount rate.



- EU contibution is justified if
- Financial present value is negative
- But economic present value is positive

IN ECONOMIC COST BENEFIT ANALYSIS

- We use shadow prices instead of market prices.
  - E.g. we quantify the monetary value to time saved by people by operating subway number 4.
  - We quantify agricultural production lost due to climate change, etc.
- **We use social discount rate instead of financial discount rate.**

THE CHOICE OF THE SOCIAL DISCOUNT RATE WILL DETERMINE WHETHER

- Fighting climate change looks a good decision (timeframe: over 100 years)
- Forestation projects seem wise or not in economic terms. (time frame: 60-120 years or more)
- Building dams are reasonable or not (timeframe over 100 years)

DISCOUNTING IN CLIMATE MODELS: THE STERN-NORDHAUS DEBATE

- Ramsey-formula: STPR = $\delta + eg$
- Stern-report (2006):
  - δ=0,1 (ethical argument: the well-being of different generations must be given equal weight, deviation from 0 is justified only by the possibility of the extinction of humanity)
  - e=1 (based on UK estimates based on individual savings decisions)
  - g=1,3 (growth rate)
- Nordhaus: a discount rate in line with market yields should also be used in climate change decisions 2007: 5,5%; 2017: 4,25%

Scenario	Assumption	2015	2020	2025	2030	2050
Base parameters						
	Baseline*	31.2	37.3	44.0	51.6	102.5
The Stern Review discounting						
	Uncalibrated†	197.4	266.5	324.6	376.2	629.2
Alternative discount rates*						
	2.5%	128.5	140.0	152.0	164.6	235.7
	3%	79.1	87.3	95.9	104.9	156.6
	4%	36.3	40.9	45.8	51.1	81.7
	5%	19.7	22.6	25.7	29.1	49.2

The SCC is measured in 2010 international US dollars.
*Calculation along the reference path with current policy.
†Calculation along the optimized emissions path.

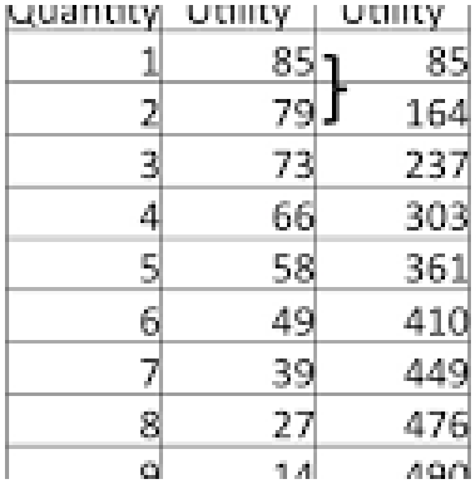
Forrás: Nordhaus 2017

EU SUGGESTION

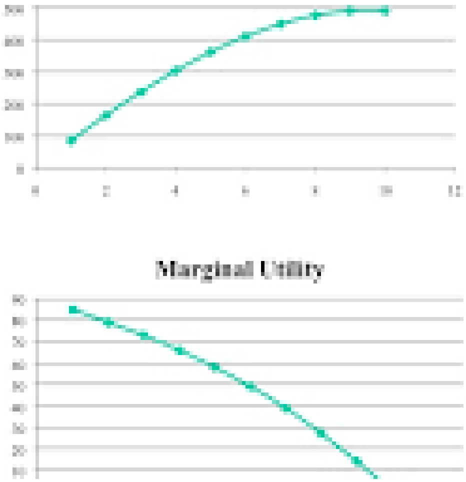
- Social Discount Rate (SDR), reflects the social view on how future benefits and costs should be valued against present ones.
- European Commission recommends that for the social discount rate
  - 5% is used for major projects in Cohesion countries and
  - 3% for the other Member States.
  - Member States may establish a benchmark for the SDR which is different from 5% or 3%, on the condition that:
    - i) justification is provided for this reference on the basis of an economic growth forecast and other parameters;
    - ii) their consistent application is ensured across similar projects in the same country, region or sector.

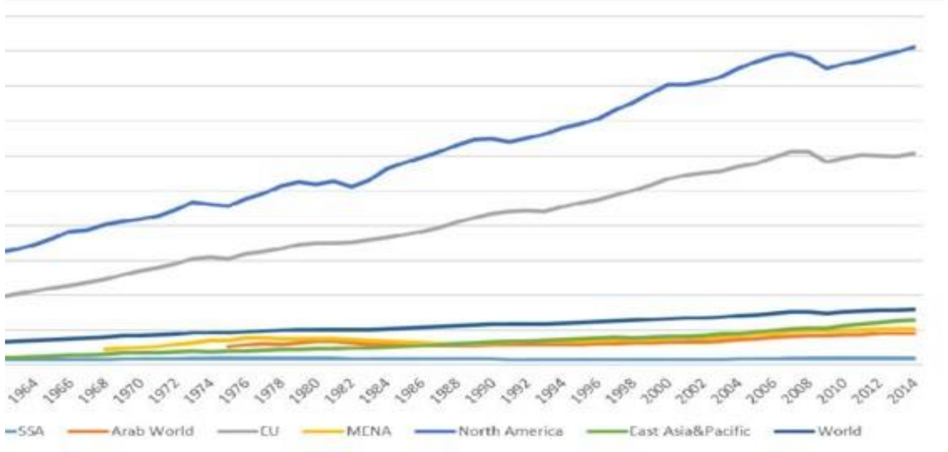
WE ARGUE THAT

- A smaller discount rate should be applied for Hungary
- Much smaller discount rate should be applied for long term intergenereretional projects



Quantity	Utility	Utility
1	85	85
2	79	164
3	73	237
4	66	303
5	58	361
6	49	410
7	39	449
8	27	476





ESTIMATING THE SOCIAL DISCOUNT RATE BASED ON STPR

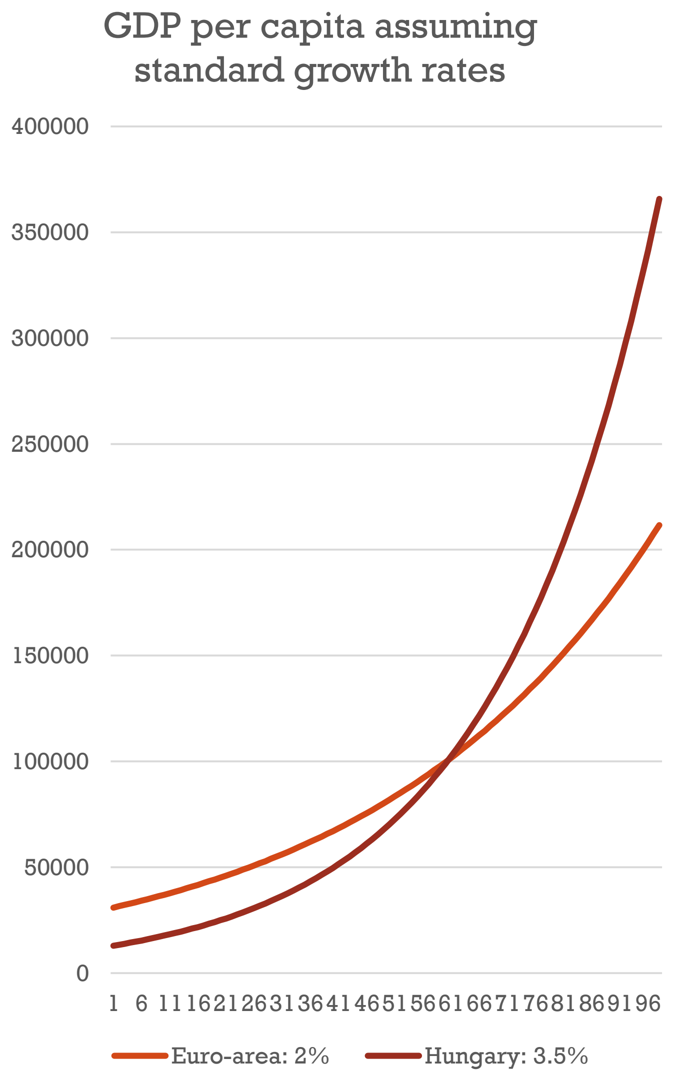
- Frank P. Ramsey [1928] :
- STPR = $\delta + eg$
- where
- δ = pure time preference rate,
- e = elasticity of marginal utility of consumption, a measure of how utility changes as consumption changes.
- **g = growth of per capita real consumption.**

- European Commission recommends that for the social discount rate
  - 5% is used for major projects in Cohesion countries and
  - 3% for the other Member States.

  - the difference between the proposed discount rates reflects the difference in the growth rates of the countries.
  - How realistic is this difference in short run or in longer run?

HOW MUCH GROWTH DIFFERENCE DO WE ASSUME BETWEEN MEMBER STATES?

- Short run: between 2015 and 2020 the growth rate of Hungary was indeed higher than that of the Euro area
- But in very long we cannot assume higher 1.5% higher growth rate
- If this difference in growth rates persisted, we would be more developed in 60 years than the old EU member states.
- It is more realistic to assume that the growth gap will disappear in the long run.
- In the case of the long-term discount rate, it is worth assuming the same rate as in the old member states.



POSSIBLE VALUE OF SOCIAL TIME PREFERENCE PARAMETERS

STPR = δ + eg

Pure time preference rate (δ):

1. An individualistic approach based on long-term individual decisions. Applicable for medium-term projects. Pure time preference + life chances based on mortality rate (value 1.3-1.4 based on Hungarian data)
2. Normative approach: Its value is 0.1 (but it can be zero or negative, based on an ethical decision). Applicable for intergenerational projects

Growth rate of per capita consumption (g):

It is estimated based on historical data, its value depends on the time period. (e.g. 20-year average in Hungary 2.5%) Long run: smaller value, 1-1.5% is applicable

Elasticity of the marginal utility of consumption:

The most difficult parameter to estimate, five different approaches are also available for estimation

Eg based on the tax system: 1 (Hungary), based on subjective well-being in most countries it is 1.2-1.3

OTHER ASPECTS TO BE CONSIDERED

- Some features of human decision making:

- We apply a lower discount rate to things that are important to us
- Human decision-making follows a hyperbolic pattern, not an exponential one. We apply a higher discount rate to things close to time than to those more distant (psychological observation).
- For intergenerational projects, the use of a pure time preference rate of 0 is ethically justified

PROPOSED APPROACH FOLLOWS UK TREASURY APPROACH

UK Treasury for UK

Years	STPR (standard)	STPR (reduced rate, pure time preference rate = 0)	Health	Health (reduced rate, Pure time preference rate = 0)
0 – 30	3.50%	3.00%	1.50%	1.00%
31 – 75	3.00%	2.57%	1.29%	0.86%
76 – 125	2.50%	2.14%	1.07%	0.71%

Proposed for Hungary

Évek	STPR (standard)	STPR (csökkentett ráta, tiszta időpreferencia ráta = 0)	Egészség	Egészség (csökkentett ráta, tiszta időpreferencia ráta = 0)
0 – 30	4-4.5%	3.5-4%	2-2.5%	1.5-2%
31 – 75	3.00%	2.57%	1.29%	0.86%
76 – 125	2.50%	2.14%	1.07%	0.71%