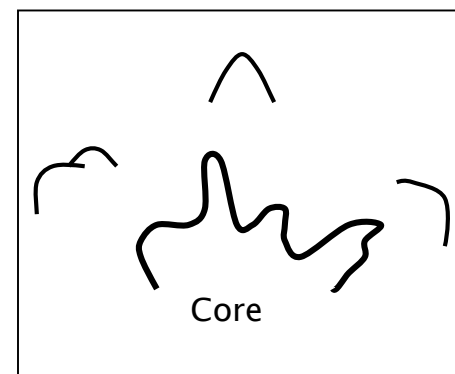
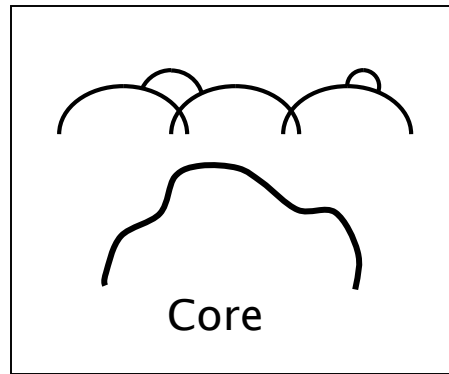
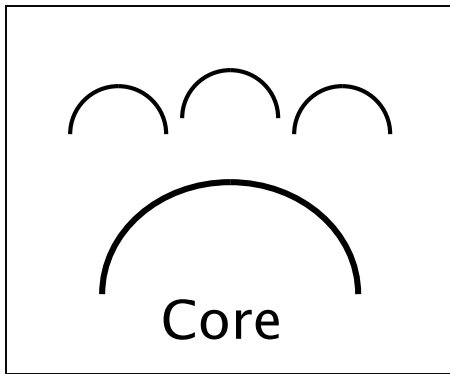


# Careers, quality of research and why you need to understand the system

Ulf Sandström  
Royal Inst Technology

Presentation at CNIC, Madrid – PhD day Nov 22, 2019

# Research fronts: Three versions



HARD

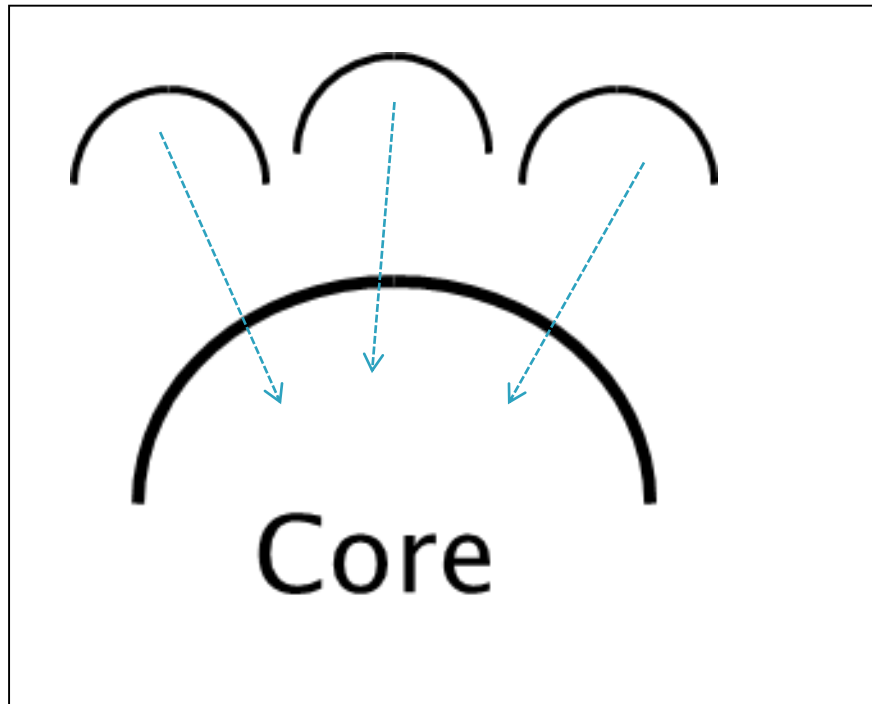


SOFT

Paradigmatic

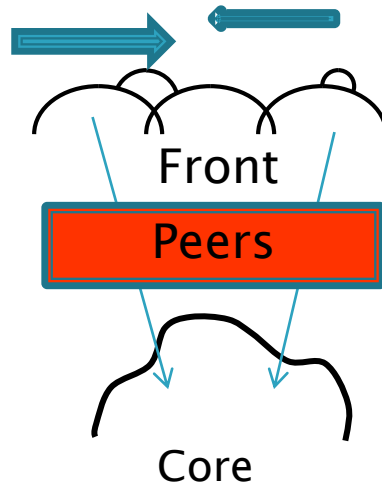
Non-paradigmatic

# Research fronts



# Research programmes and knowledge fronts

Competition



Results:



Handbooks  
Readers  
Wikipedia

Infrastructure  
Research funding  
Universities  
Research Institutes

Suggested reading:  
**Imre Lakatos**

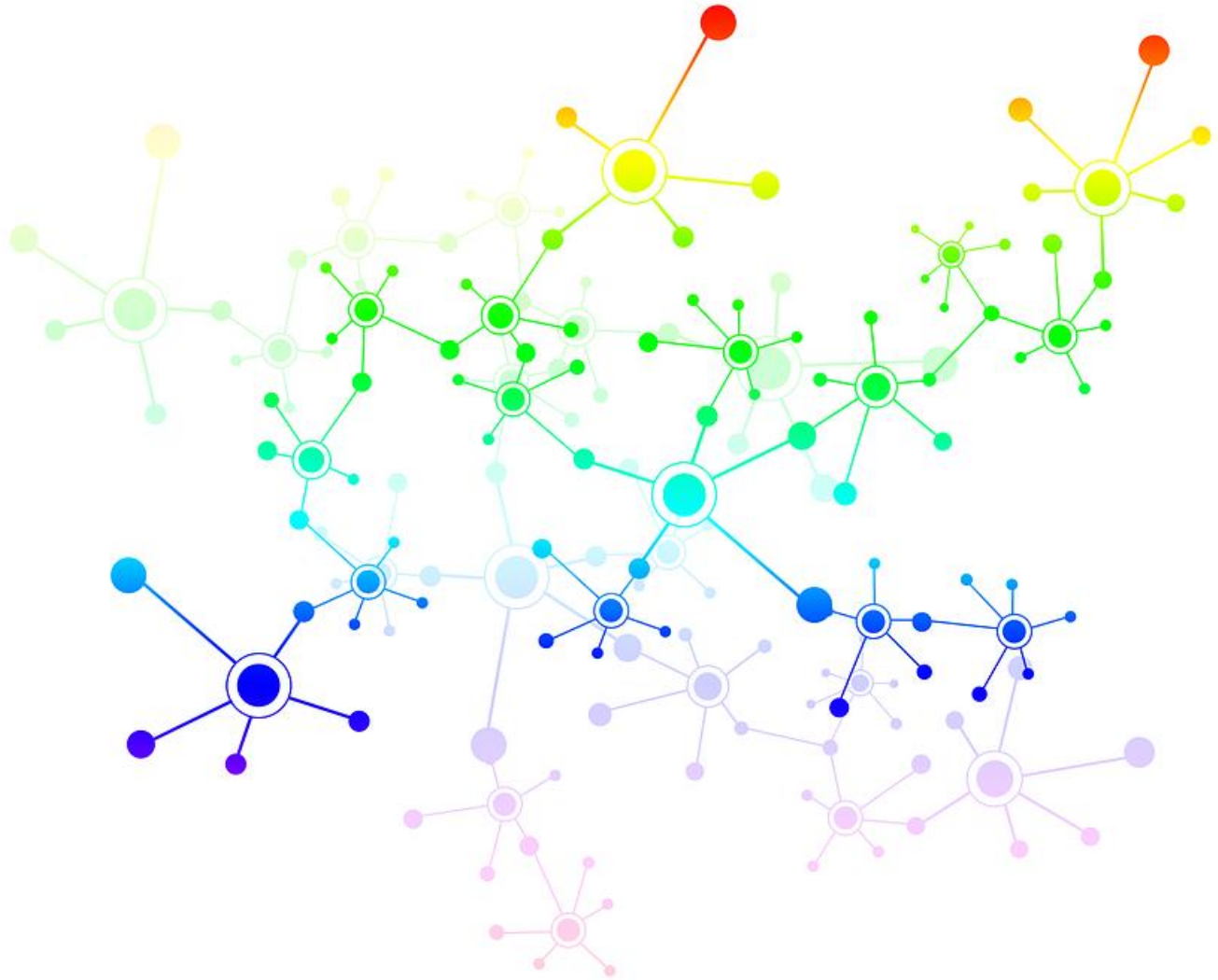
# Which Scientific Community?

- ▶ Local Community
  - ▶ International Community
- 

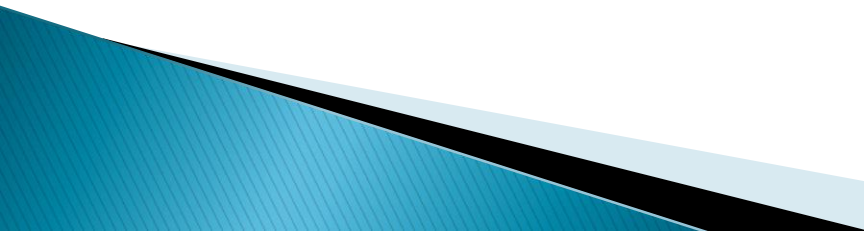
# Local Community



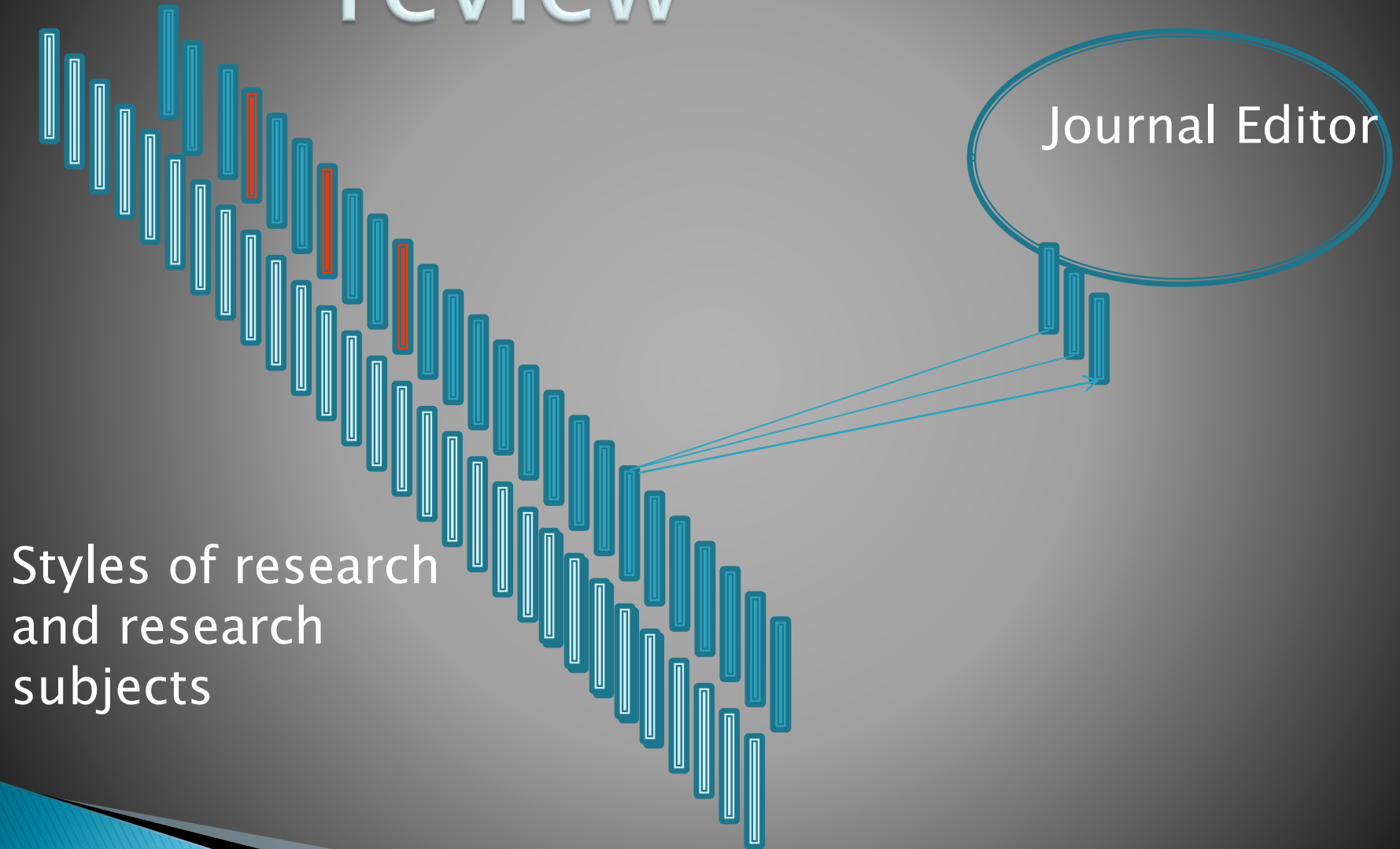
# International Community



# Peer review – concepts

- ▶ Classical peer review  
E.g. Journals
  - ▶ Modified peer review  
E.g. Councils
  - ▶ Program Officer model
  - ▶ Performance indicators – reward  
E.g. Bibliometrics
- 

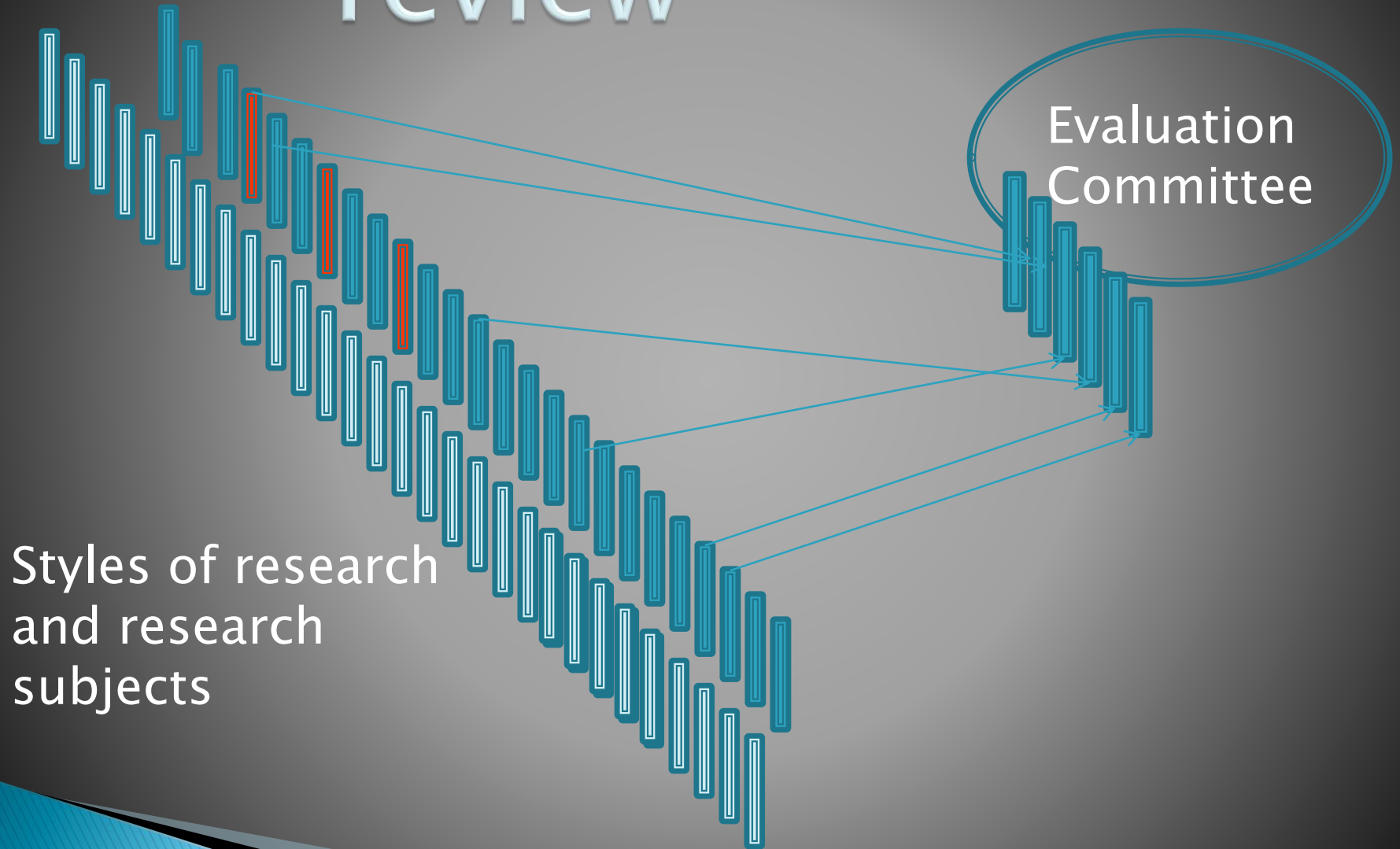
# Classical peer review



Styles of research  
and research  
subjects

Journal Editor

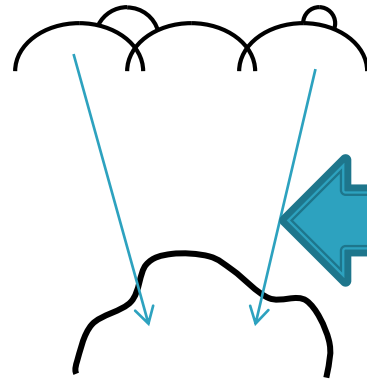
# Modified peer review



# Council model

Track Record is favoured

Ex ante evaluation



*Cognitive Bias*  
*Conflicts of Interest*

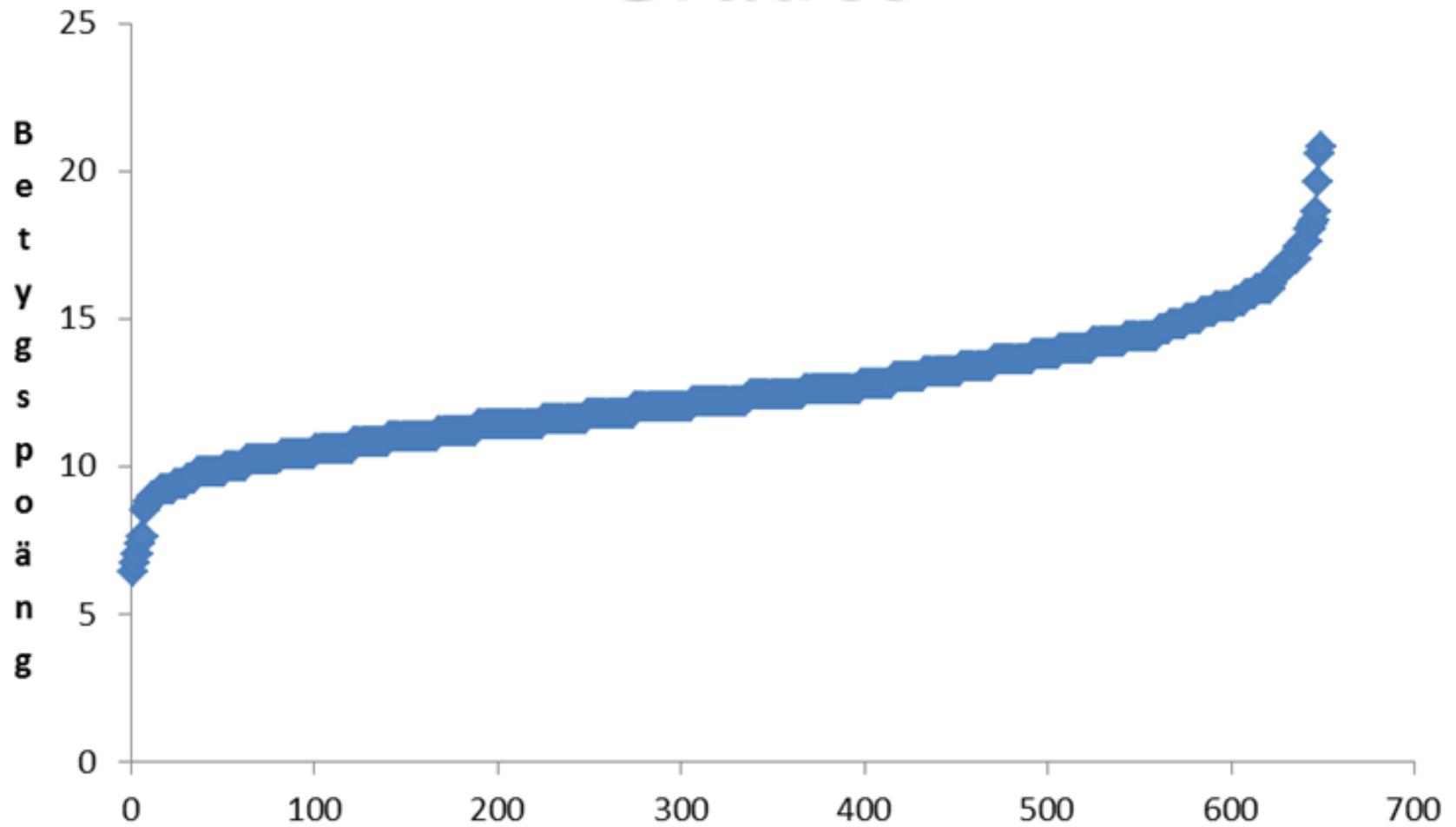


Core

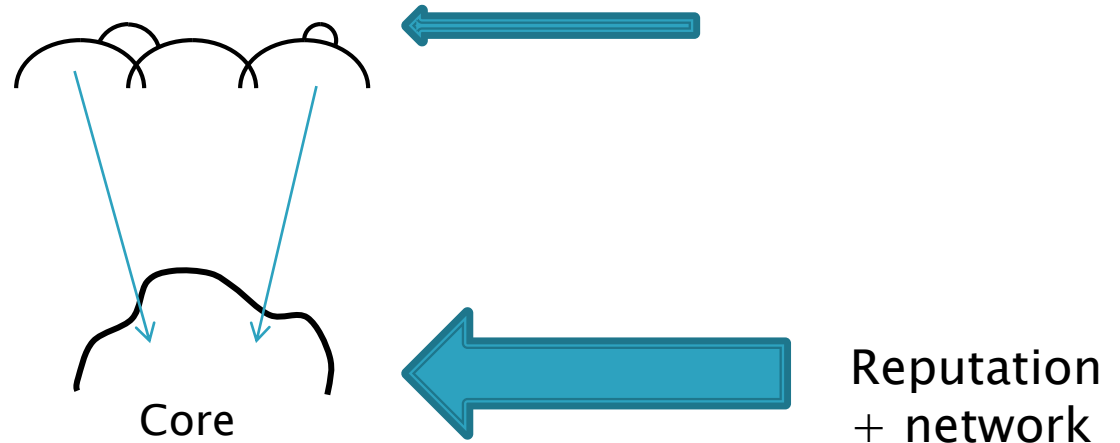
Handbooks  
Textbooks  
Wikipedia

Infrastructure  
Financing  
Universities  
Research Institutes

# Grades



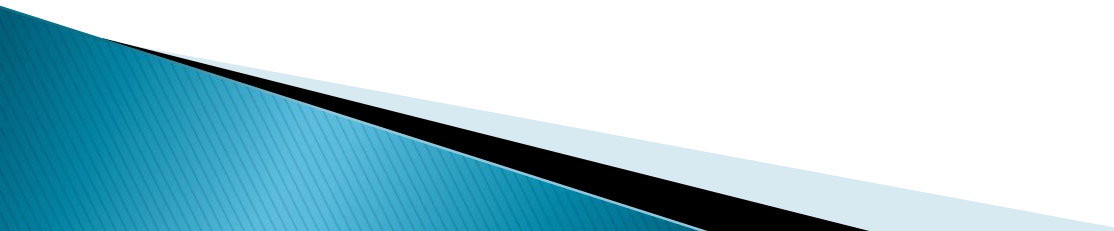
# Program officer model



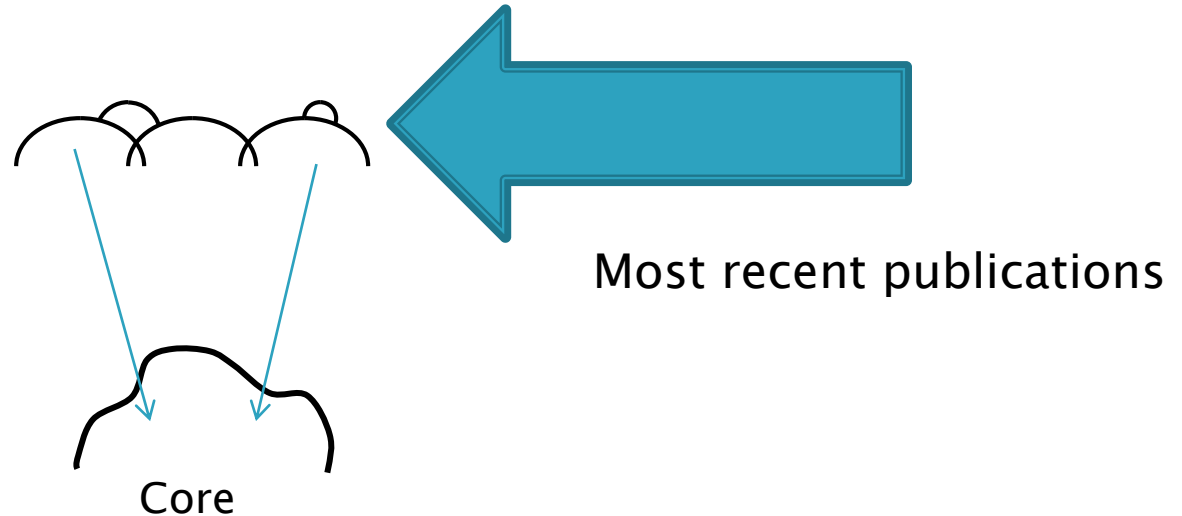
Handbooks  
Textbooks  
Wikipedia

Infrastructure  
Financing  
Universities  
Research Institutes

# Reward model

- ▶ Use of publication databases
  - ▶ Rewards for the best performances (during the last period)
  - ▶ Grants are given for continuation
  - ▶ Can be combined with many different models
- 

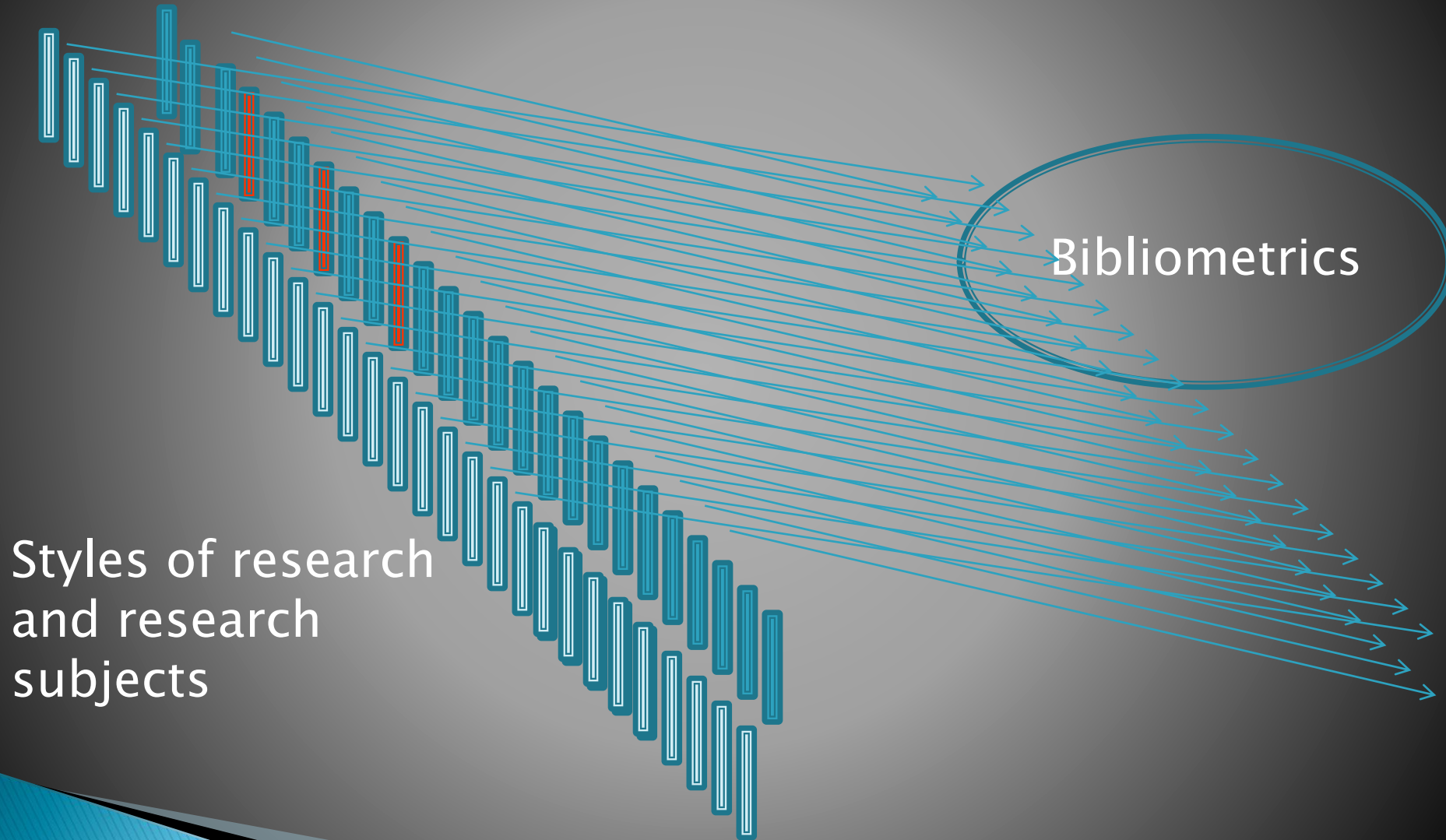
# Reward model



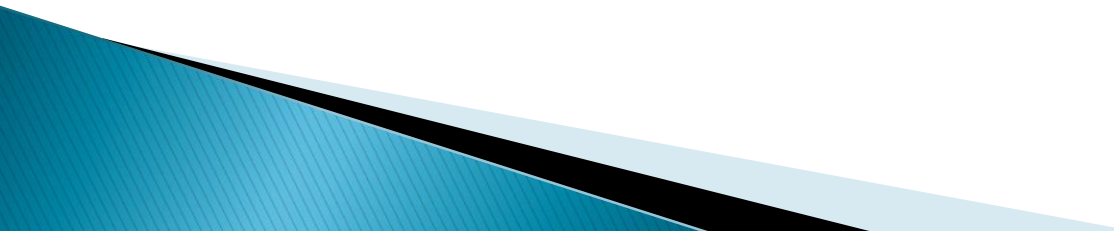
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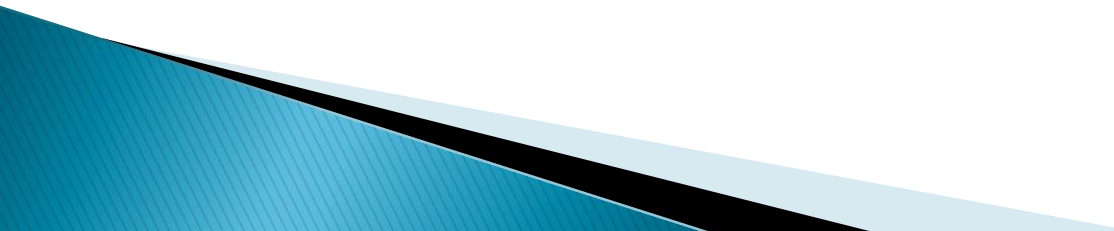
# Reward-model



# Criticism to peer review

- ▶ Low reliability
  - ▶ Low robustness (selection of reviewers)
  - ▶ High cost,
  - ▶ Recruitment of reviewers (pragmatism)
  - ▶ Nepotism
  - ▶ Sexism
  - ▶ Cognitive bias
- 

# Consequences of peer rev.

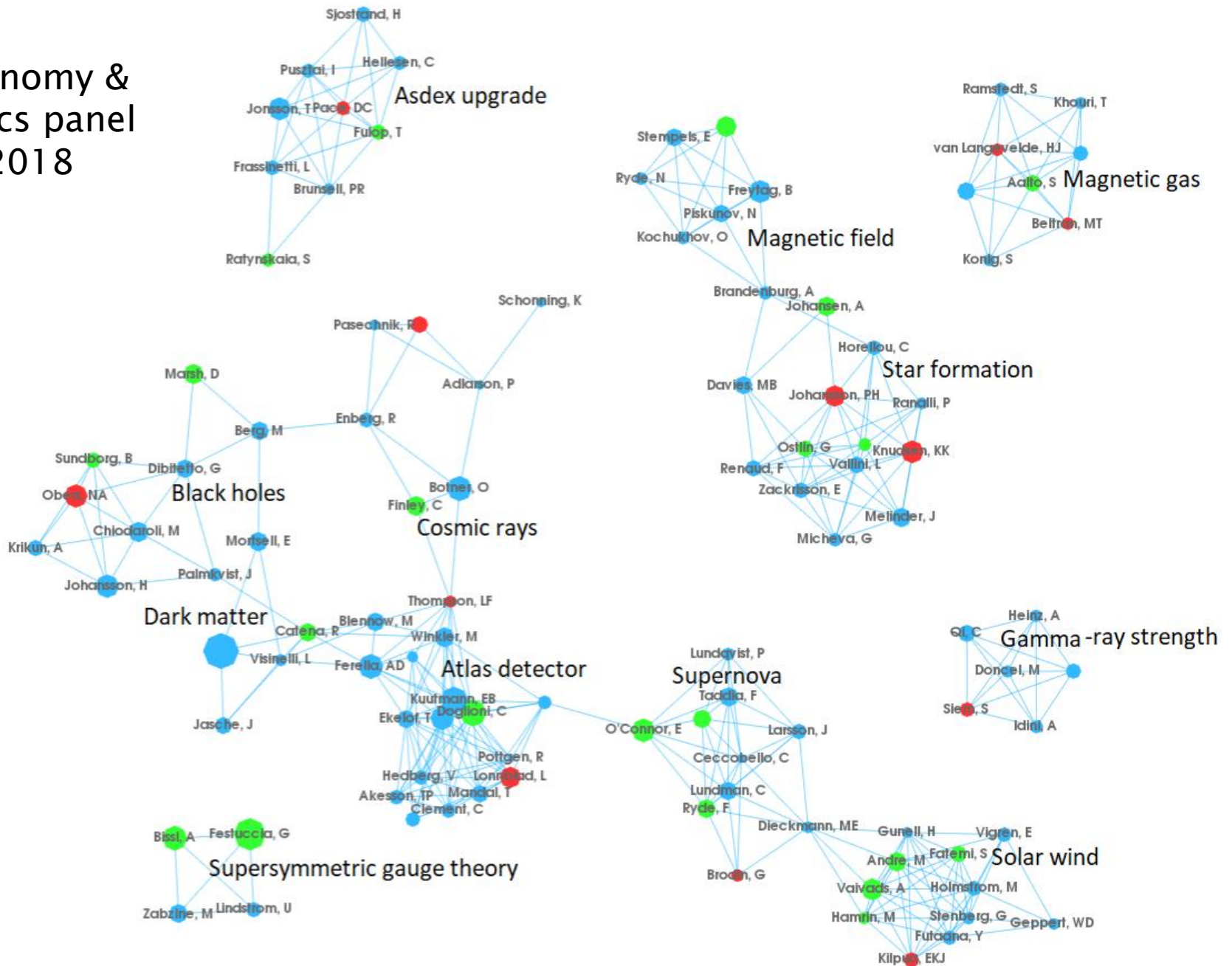
- ▶ In Sweden: proposal hysteria
  - ▶ Tend to publish mainstream follow-up studies
  - ▶ Conservatism
  - ▶ Manage the core is more important than changing the front
  - ▶ Hindrance of renewal
- 

# Cognitive bias in panels

Readings: Sandström, Cognitive bias in peer review, ISSI (2009).  
Sandström & vd Besselaar, Influence of cognitive distance on grant  
decisions STI (2017).  
[www.forskningspolitik.se](http://www.forskningspolitik.se)



# Astronomy & Physics panel SRC 2018



# Peers: the best or the mediocre?

Who selects the panel members?

# Are peers excellent per definition?

P	Frac P	NCSj	NJCS	NCSf
134	42,6	0,88	0,93	0,81

Buckle  
Eloranta  
Evans  
Janschek  
Jensen  
Utterback  
van Brussel  
Westkamper

Prominent  
researchers?  
The SRC  
Medical  
Panels  
2010

NR	B-Grp	NCSf
1	C2	0,88
2	G2	0,94
3	E2	1,02
4	E1	1,03
5	A1	1,03
6	F3	1,06
7	B2	1,12
8	F2	1,13
9	B1	1,17
10	D2	1,18
11	G1	1,22
12	F1	1,30
13	D1	1,45
14	C1	1,48
	<b>Total</b>	<b>1,13</b>

# Foreign members ?

Type of peer	Performance
"International"	0.96
Swedish	1.18
Others	1.13
<b>Total</b>	<b>1.13</b>

Reading: Sandström: Vetting the panel members (2015)  
[www.forskningspolitik.se](http://www.forskningspolitik.se)

# ERC panels

INTERVIEWS SUGGEST:

- LACK OF CLEAR CRITERIA
- HIGH PANELIST WORKLOAD => STEREOTYPING
- DROPPING CRITERIA (INDEPENDENCE)
- DIFFERENT BEHAVIOR (OVERSELLING, SELF-PROMOTING) AND GENDERED APPRECIATION BY PANELISTS

Reading: van den Besselaar et al., *Scientometrics* (2017)

# Panel work is pragmatic

- ▶ First, they do not distinguish between past performance and the proposal =same
- ▶ Secondly, they focus on rejecting the applications by searching for weak points
- ▶ They do not search for ground-breaking research

Reading: van den Besselaar et al. Explaining gender bias in ERC grant selection – a first exploration of the life sciences case, STI conference (2018)

# Take care of your independence..

- ▶ Relation PhD and supervisor(s)

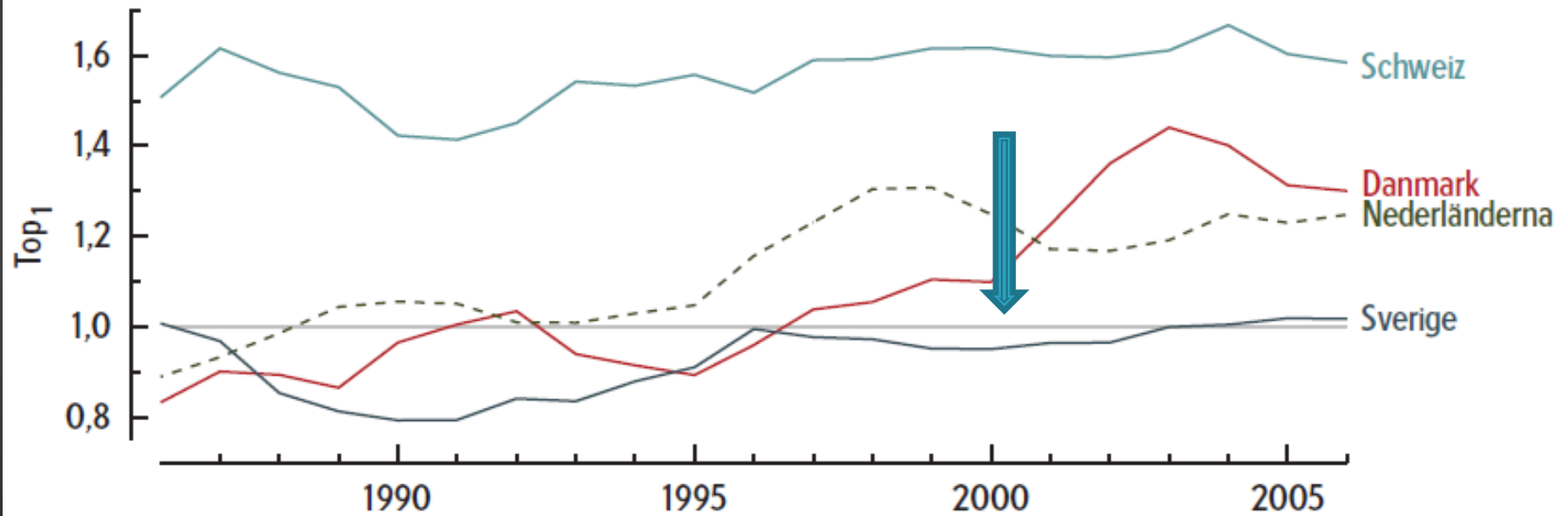


Start to publish **without** your supervisor asap!  
Start your own research lines or a new research programme

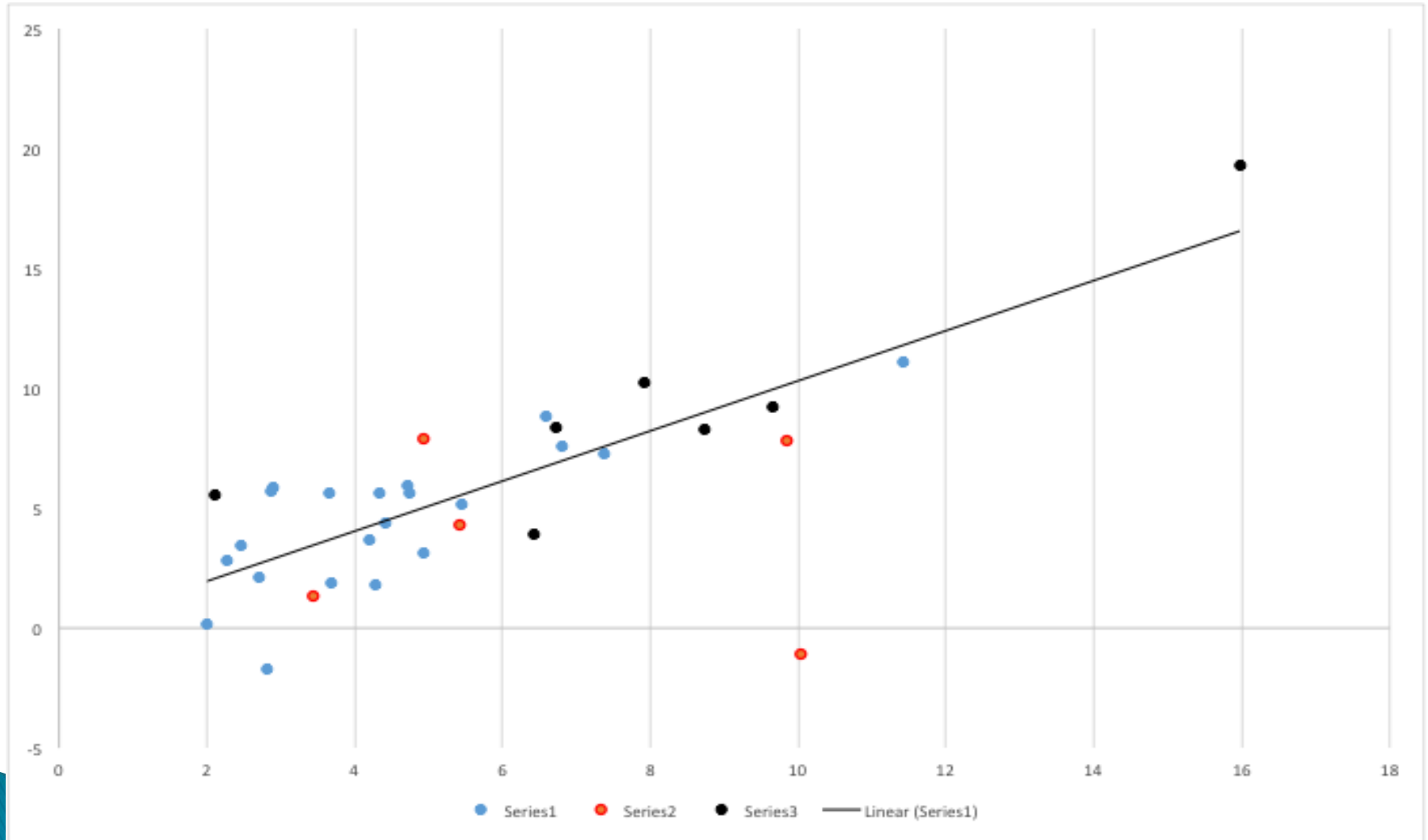
Reading: Van den Besselaar & Sandström, PLoS ONE (2019)

# Do councils make a difference?

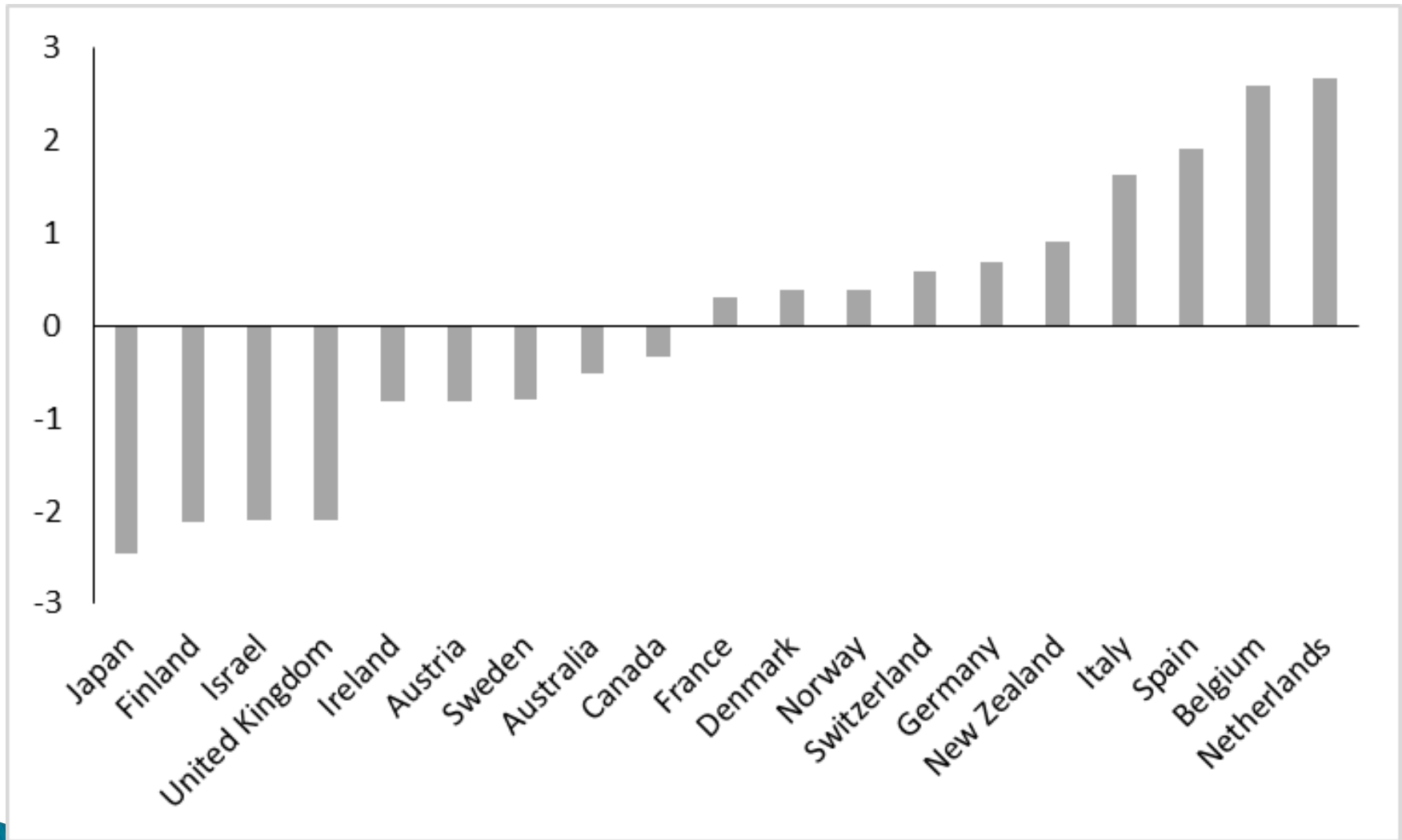
Figur 2. Top<sub>1</sub> och topp<sub>10</sub> för Sveriges och jämförelseländernas publikationer



# Change in FracPP10 by change in HERD

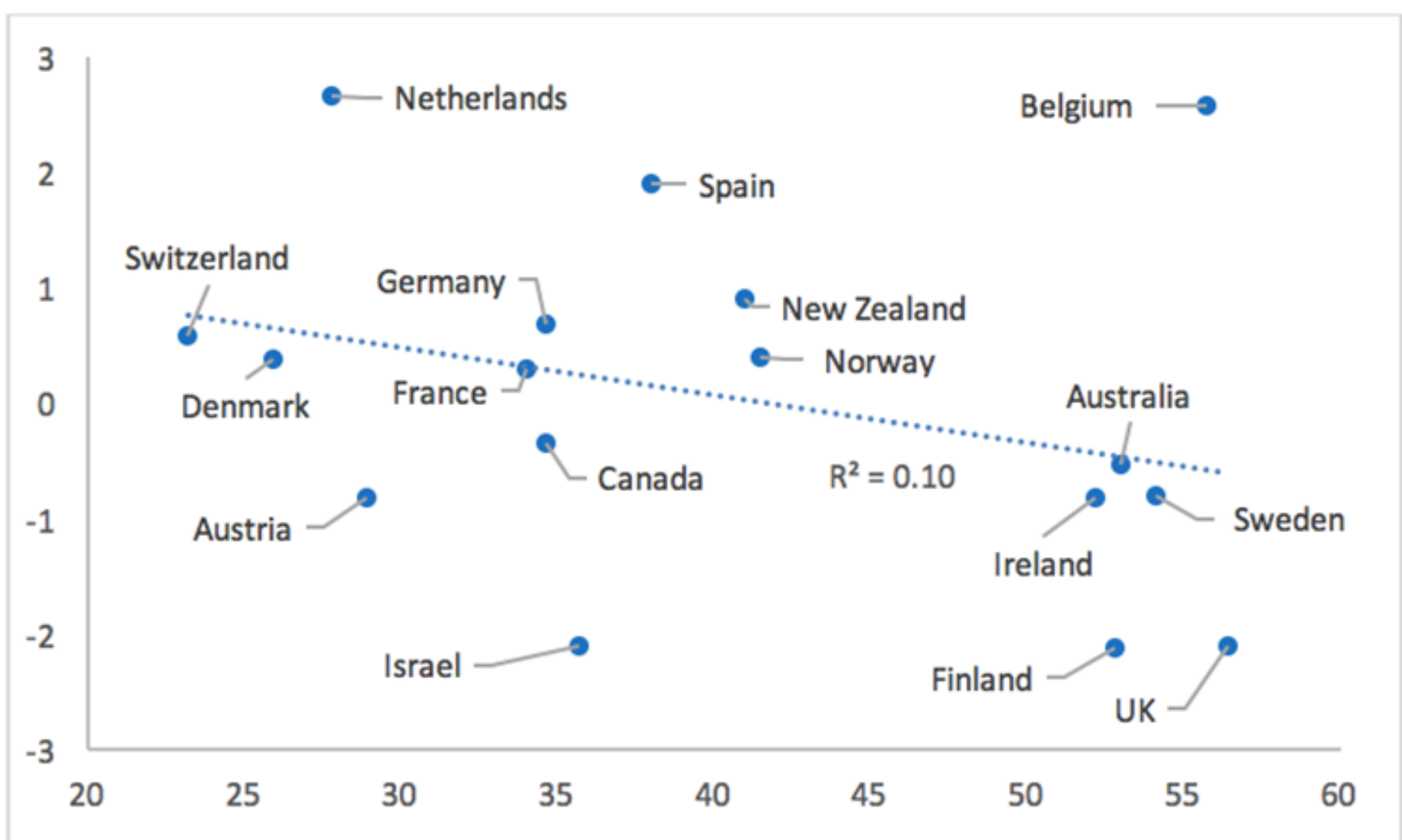


# Residuals per country

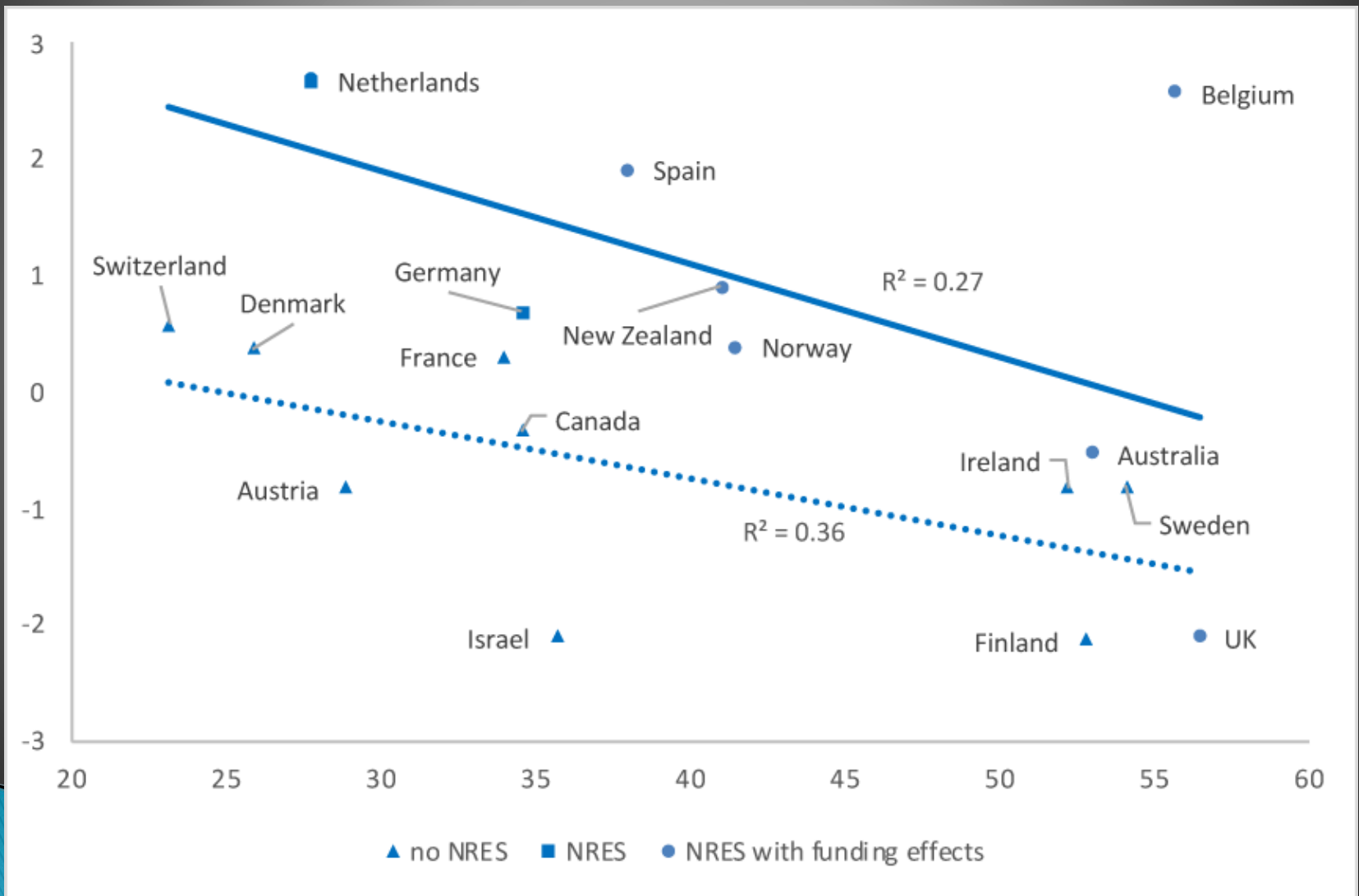


Reading: Sandström & vd Besselaar;  
Journal of Informetrics (2018)

# Performance vs. Institutional funding



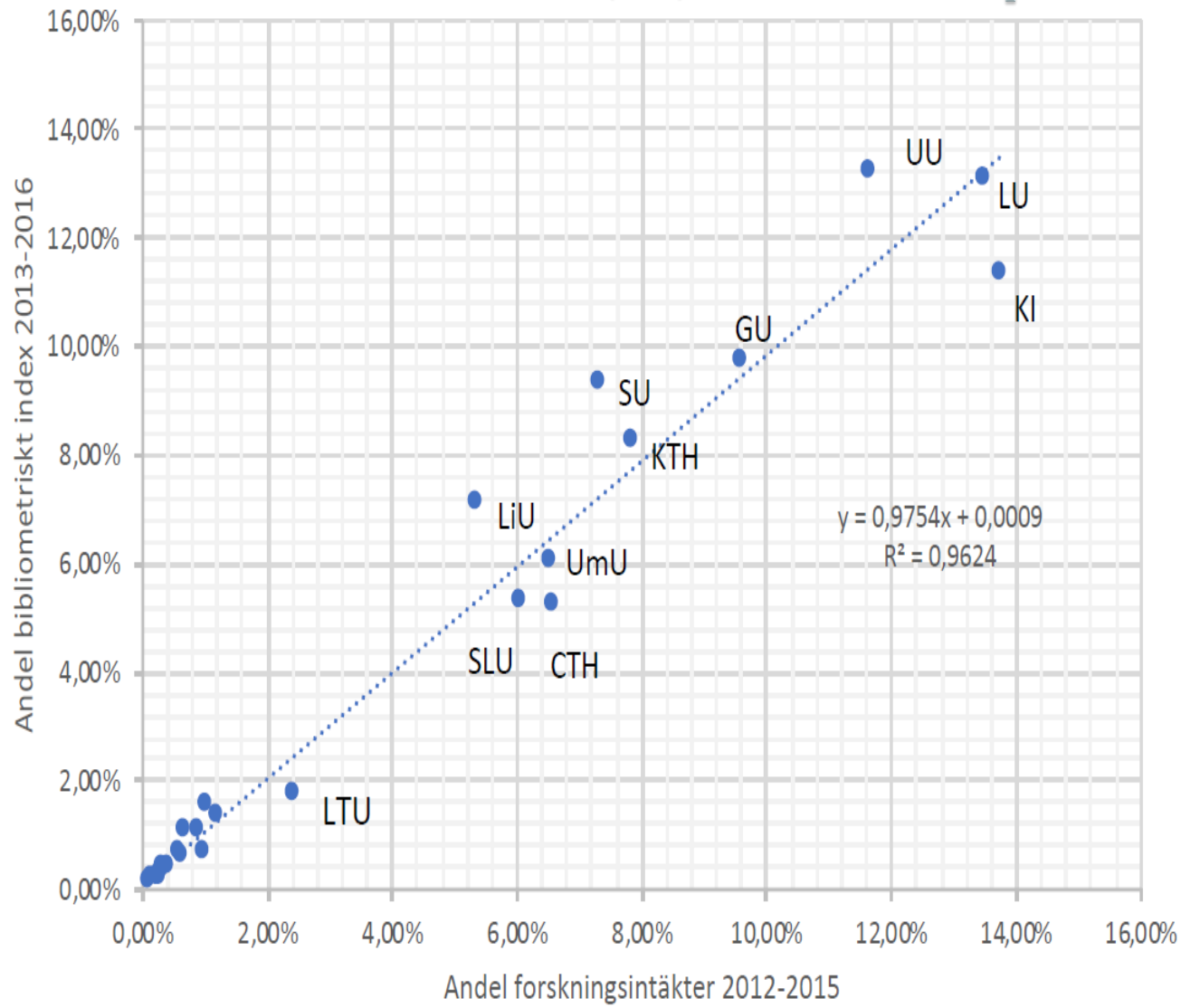
# Evaluation system matters!



# Holds also at the national level

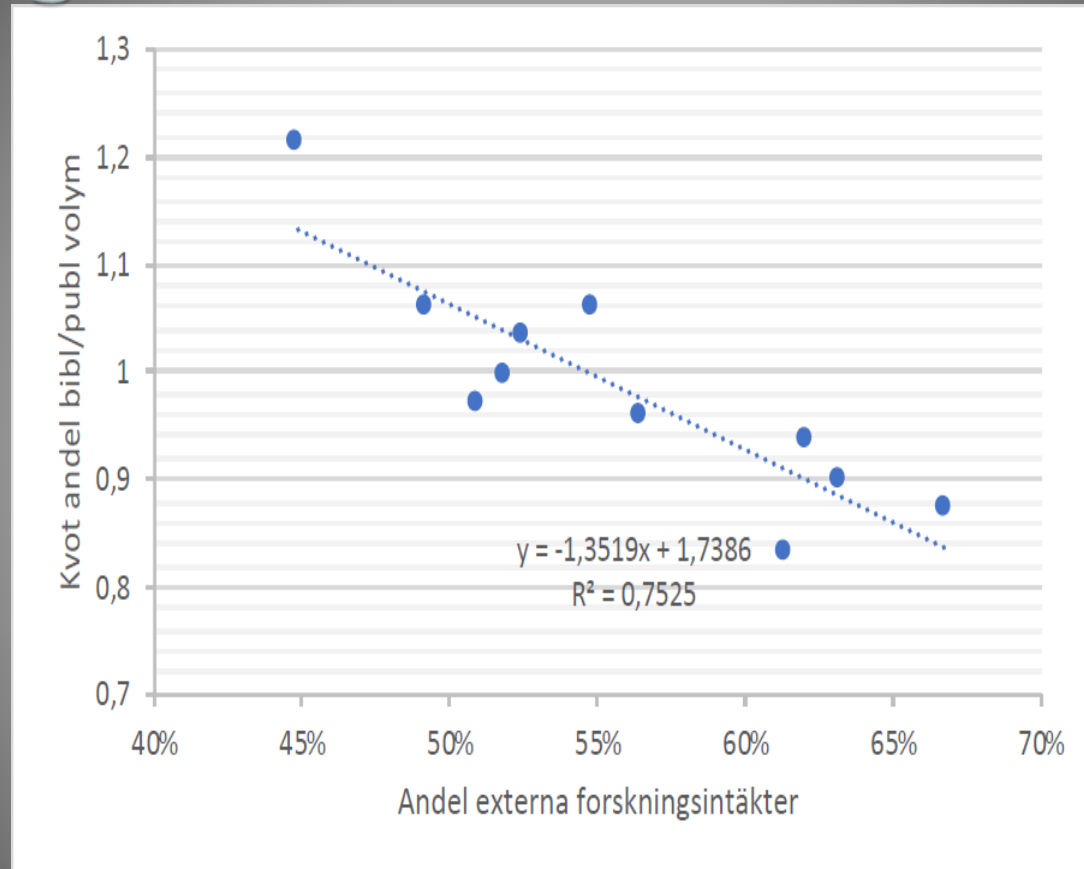
- ▶ Swedish universities behaves in the same way,
- ▶ More funding from external resources leads to lower output

# Research income (%) vs output (%)



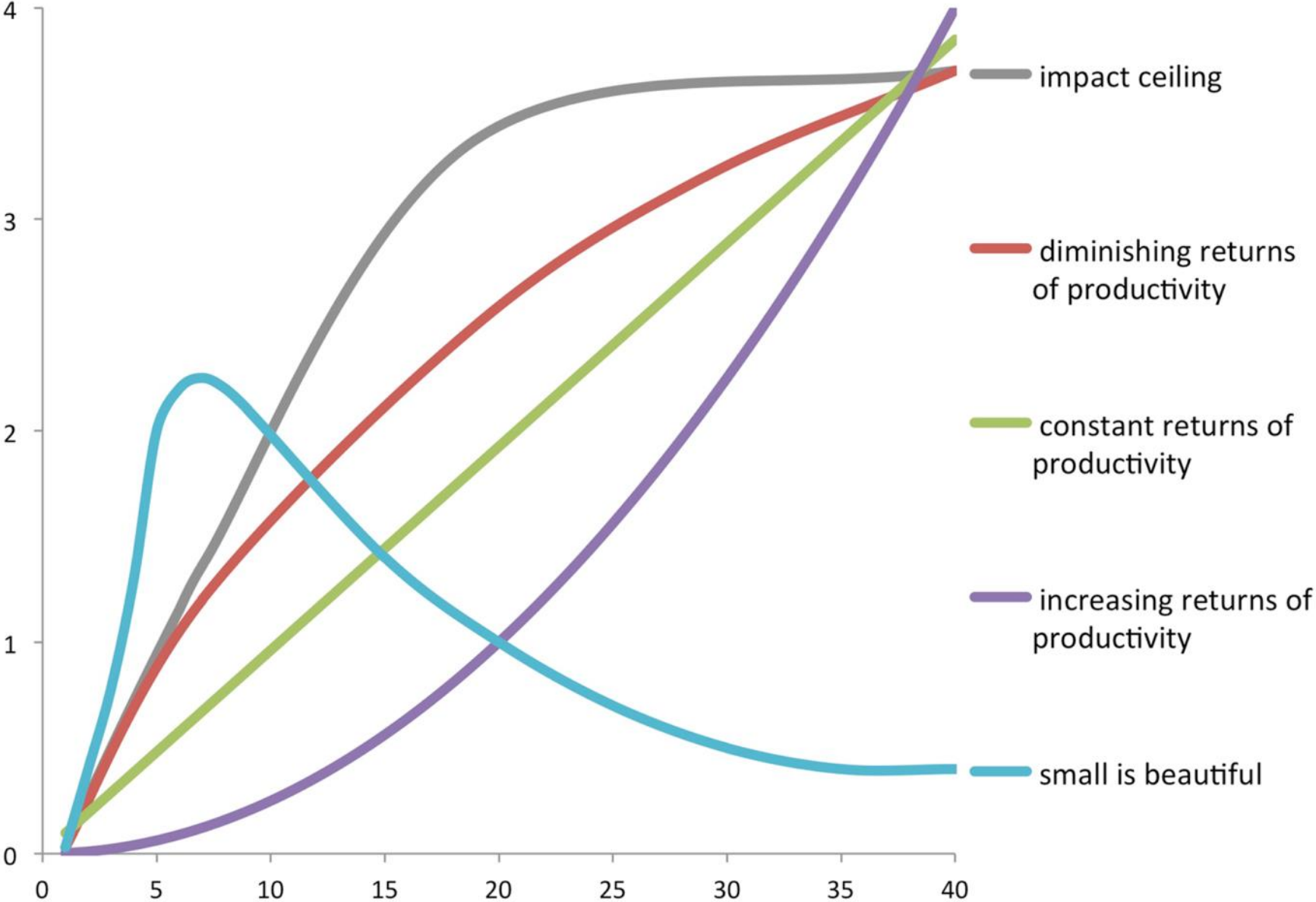
# Output vs external (project) funding in Sweden

Quality  
Of  
Publications  
(citations)

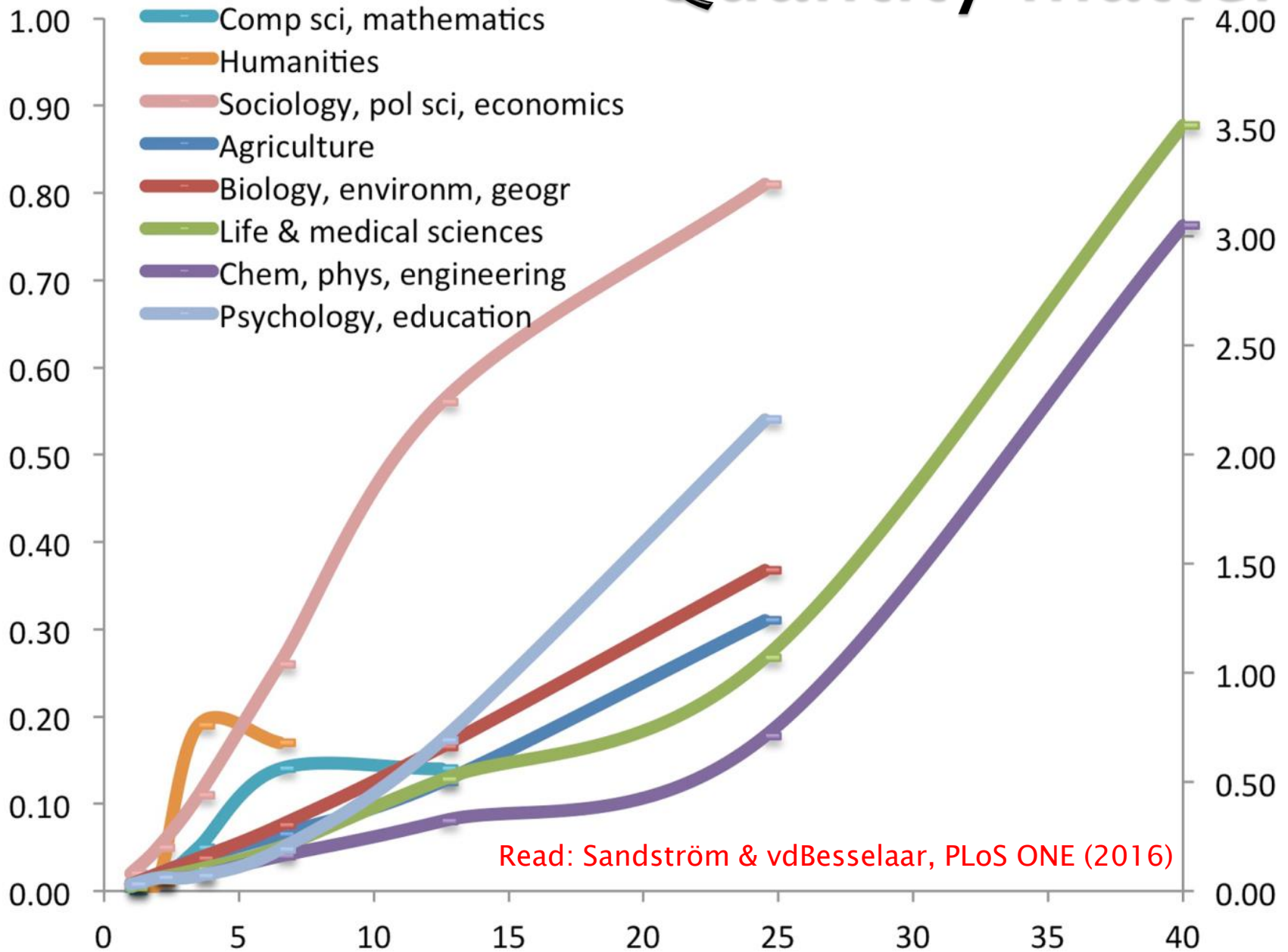


Project funding (third party funded)

# Quantity and/or Quality?



# Quantity matters!



Read: Sandström & vdBesselaar, PLoS ONE (2016)



Thanks for  
listening!

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[www.forskningspolitik.se](http://www.forskningspolitik.se)