The heterogeneous landscape of bibliometric indicators

EVALUATING MODELS FOR ALLOCATING RESOURCES AT SWEDISH UNIVERSITIES

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Aim

1. to map and describe the various models and indicators that currently are applied across Swedish universities
2. to systematically evaluate allocation models used by universities in Sweden

Background

- Increasing use of bibliometric indicators for assessing 'research quality' in academia
- Few overviews and studies on the use of bibliometrics at the institutional level
- Need for a 'evaluation of evaluation' (Dahler-Larsen, 2012)
- Call for guidelines, standards, ethics (Glänzel & Wouters, 2013, Gingras 2014, Furner 2014)
- Debate regarding different models for bibliometric evaluation in Swedish academia (e.g. Swedish and Norwegian) (Nelhans, 2013)
- The effects of evaluation models on research practices (Henriksen & Schneider, 2014, Hammarfelt & De Rijcke, to appear)

Present performance based funding model (2008/2012)

Basic funding (80 %)

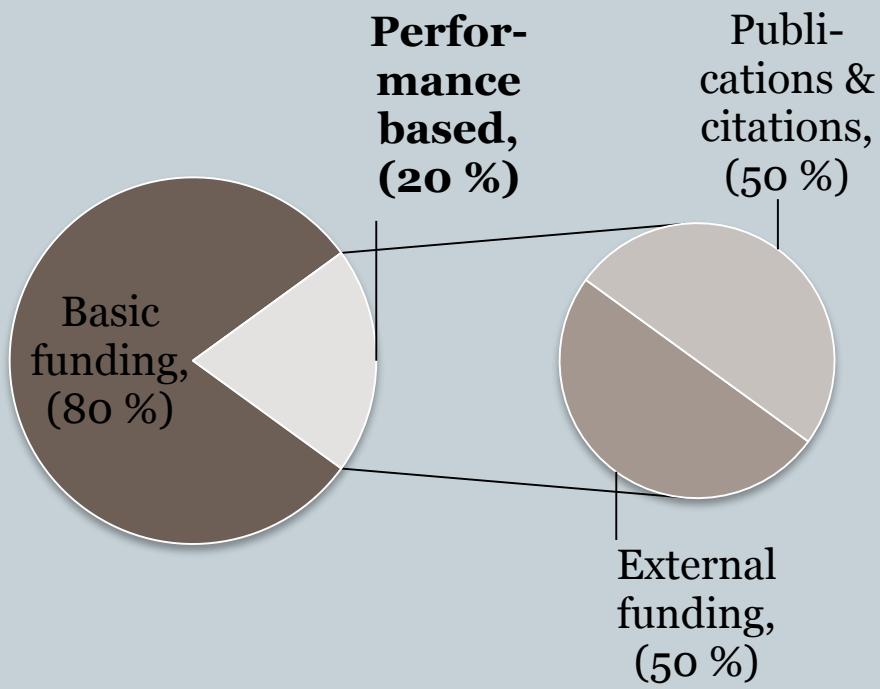
Performance based share (20 %)

1. External funding (50 %)
2. **Publication performance** (50 %) as normalized data for ***publication*** & ***citation rates***

Main features

- Four year moving average
- Author fractionalization
- Normalization:
  - Publications: *Waring Distributions*
  - Citations: *Field Normalized Citation Level*
- Additional Weighting

  Medicine + Technology: 1.0; Science: 1.5;
  Social Sci + Humanities 2.0; Other: 1.1



Sources: Prop. 2008/09:50. *'A boost for research and innovation*; Prop. 2012/13:30. *'Research and innovation'* Utbildningsdepartementet [Ministry of Education and Research]. Stockholm: Fritzes.s

Evaluation systems

- Permanent
- Routinized
- Extended across time and space

Dahler-Larsen, P. (2012) 'Evaluation as a situational or a universal good? Why evaluability assessment for evaluation systems is a good idea, what it might look like in practice, and why it is not fashionable', *Scandinavian Journal of Public Administration*, 16(3), 29-46.

Three criteria

1. Legitimacy and appropriateness
2. Organizational and methodological soundness and stability
3. Degree of transparency and learning

(1) Legitimacy and appropriateness

- Is an integrated evaluation system appropriate to assess the activity?
- Do the evaluation system reinforce 'micro-accountability'?
- How are people under the evaluation system likely to behave if they take the criteria seriously? "Thus, if activity is good, evaluation criteria will be met" and vice versa.

(Dahler-Larsen, 2012)

(2) Organizational and methodological soundness

- How reliable is the 'techno-structure'?
- How is the evaluation system anchored in the organizational structure?
- Is the evaluation system able to provide reliable and trustworthy information? Capacity to protect, analyse and report?
- How mandatory is the system?

(Dahler-Larsen, 2012)

(3) Degree of transparency and learning

- Are the costs well-described?
- Has the evaluation system been piloted? Evaluated in practice?
- Have alternatives to evaluation systems been considered – why is evaluation deemed as the most productive way to better quality?
- Does the evaluation system incorporate learning and responsiveness?

(Dahler-Larsen, 2012)

Swedish Academia

47 HEIs

27 awarding third cycle degrees (doctorates)

1 Blekinge Institute of Technology
2 Chalmers University of Technology
3 Halmstad University
4 Jönköping University
5 Karlstad University
6 Karolinska Institutet
7 KTH Royal Institute of Technology
8 Linköping University
9 Linnaeus University
10 Luleå University of Technology
11 Lund University
12 Malmö University
13 Mid Sweden University
14 Mälardalen University
15 Stockholm School of Economics
16 Stockholm University
17 Swedish School of Sport and Health Sciences, GIH
18 Swedish University of Agricultural Sciences
19 Södertörn University
20 Umeå University
21 University of Borås
22 University of Gothenburg
23 University of Gävle
24 Uppsala University
25 Örebro University

Preliminary findings - overview

- All universities – with the exception of Chalmers and Stockholm School of Economics - use bibliometric measures to some extent for resource allocation at one or several levels
- The types of measures and models used differs considerably, but models counting publication are more common than citation based models
- The largest and most diversified universities often use a range of measurements depending on faculty

Publication based (10)	Citation based (2)	Combination of C & P (11)
Blekinge Institute of Technology	Karolinska Institutet	Jönköping University
Halmstad University	KTH	Karlstad University
Linneaus University		Lund University
Luleå University		Linköping University
Mid Sweden University		Malmö University
Mälardalen University		Swedish University of Agricultural Sciences
Stockholms University		The Swedish School of Sport and Health Sciences
Södertörn University		Umeå University
University of Borås		University of Gothenburg
University of Gävle		Uppsala University
		Örebro University

	Faculties (9)	Departments (16)	Individuals (6)
Blekinge Institute of Technology			X
Karolinska Institutet		X	
Jönköping University	X (fackhögskolor)	X	
Karlstad University		X	X
KTH	X (schools)		
Linköping university		X (Health Science)	
Linneaus University	X		X
Lund University		X	
University of Gothenburg		X	
Malmö University	X	X	
Mid Sweden University		X	
Mälardalen University	X (research spec)		
Luleå University		X	
Stockholm University		X	
Swedish University of Agricultural Sciences	X	X (not formalized)	
Södertörn University		X	X (social sciences?)
The Swedish School of Sport and Health Sciences			X
University of Borås	X		
University of Gävle		X	
University of Halmstad		X (research area)	
Umeå University	X	X	X
Uppsala University	X*	X	

Indicators & measures

Raw publication counts

Field normalized citation scores

JIF

Publication points – normalized in relation to field

Percentile in subject area

Norwegian system (modified)

Swedish system (mechanistic model)

Publications in WoS

Swedish system (modified)

Preliminary findings - evaluation

Legitimacy and appropriateness

- Activities reduced to a few quantifiable factors: publishing, external grants etc.
- Micro-accountability is reinforced but to various degrees depending on the level were evaluation takes place
- Behavior according to the system might, especially in less intricate models, divert from what is commonly perceive as quality research in many fields

Preliminary findings - evaluation

Organizational and methodological soundness

- Institutional repositories not reliable enough (e.g. peer review)
- Dependence on WoS data, External consulting
- Often not mandatory for all fields
- Location of bibliometric function

Preliminary findings - evaluation

Degree of transparency and learning

- Cost of systems seldom mentioned
- Rarely piloted or evaluated (see Umeå University)
- Alternatives not discussed in our material (so far)
- Systems not used for learning, little feedback to researchers
- Proper documentation on construction and implementation often inaccessible or missing

Summary

- Almost all universities use bibliometrics at some level
- Models for allocating resources are very diverse
- Most universities use a mixed model, but there are examples of systems using publications and citations only
- Variants of the Norwegian model are popular
- Evaluation takes place on all levels, but faculty and departmental levels are the most common

Discussion and outlook

- Risk for micro-accountability
- Behavior according to the model might not always be ideal
- Materials and methods used can be questioned (def. of peer review, JIF, normalization)
- Little feedback and transparency
- Is Sweden unique? Few studies on the use of bibliometrics on the university level.
- Why so many different models?

Thank you

Dahler-Larsen, P. (2012) 'Evaluation as a situational or a universal good? Why evaluability assessment for evaluation systems is a good idea, what it might look like in practice, and why it is not fashionable', Scandinavian Journal of Public Administration, 16(3), 29-46.

Furner, J. (2014). The Ethics of Evaluative Bibliometrics. In Cronin, B & Sugimoto, C. (eds), *Beyond Bibliometrics: Harnessing Multidimensional Indicators of Scholarly Impact*. Cambridge, MA: MIT Press

Glänzel, W. & Wouters, P. (2013). The do's and don'ts of individual-level bibliometrics. Presentation at the ISSI 2013 http://www.slideshare.net/paulwouters1/issi2013-wg-pw.

Gringas, Y. (2014). Criteria for evaluating indicators. In Cronin, B & Sugimoto, C. (eds), *Beyond Bibliometrics: Harnessing Multidimensional Indicators of Scholarly Impact*. Cambridge, MA: MIT Press

Hammarfelt, B. & de Rijcke S. (in press). Accountability in context: Effects of research evaluation systems on publication practices, disciplinary norms and individual working routines in the faculty of Arts at Uppsala University. *Research Evaluation*.

Henriksen, D & Schneider, J.W. (2014). *Is the publication behavior of Danish researchers affected by the national Danish publication indicator? A preliminary analysis*. STI 2014, p. 273-275

Nelhans, G. (2013). *Citeringens praktiker*. Diss. Department of Philosophy, Linguistics and Theory of Science. Göteborg: Göteborgs Universitet.

Åström, F., & Hansson, J. (2013). How implementation of bibliometric practice affects the role of academic libraries. *Journal of Librarianship and information Science*, *45*(4), 316-322.