

MEASURING VISIBILITY OF ACADEMIC ACTORS :
EXAMPLES IN THE FRENCH SCENE

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Context: bibliometric indicators families

“More is better”	Power (size-dependent)	<i>Output</i>	Volumes or Market shares of pub. Id. for cit (visibility)
	Performance (size-controlled)	<i>Throughput</i>	Productivity on publications and citations Over selected inputs
		pure performance on visibility	Bibliom. Impact e.g. IR=market share cit/market share pub
“What is better?”	Descriptive	<i>Positioning</i> Specialization/ variety Network position (ex.collab.)	Specialization Collab. Ratios Patterns Centrality, Betweenness

PRIME Conference, Lugano Nov.2006

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Focus: « Visibility » Measures

Classic academic visibility measure by citations: huge literature since the sixties, both on sociological background , informetric aspects, uses in science policy

Numerous caveats, some of them partially gone round by appropriate measures (example: field-dependence control of citation scores)

Wide family
with « power » or output indicators (volume or market share)
as well as performance indicators (bibliometric impact), considered here
used for global assessment as well as measures of excellence

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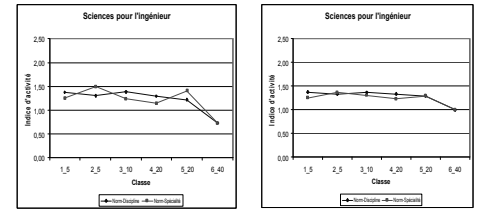
Questions

- 1 are "selective indicators", i.e. based on a selection (articles, journals...) within standard databases (Thomson-ISI), more adapted for national and institutional benchmarking than standard indicators based on all science?
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- 2 do "excellence" indicators (top-citations) bring an original information, i.e. not predicted by models of classic impact indicators?
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- 3 are multi-level indicators necessary? Multi-level indicators involve several levels of observation and normalization (the "zoom" setting on journals, or specialties, or sub-disciplines, or disciplines...)

Tool

- A particular presentation of actor's citation distribution: normalized citation profiles (levels or ranks, the latter option chosen here), belonging to "pure performance" family of indicators.
 - Principle:
 - rank in abscissa WoS articles by classes (quantiles) using various conventions: for all science, by discipline, by specialty, by journal (rationale of field-normalization)
 - display in ordinates the over or under-representation of the actor in the class, either distinct or cumulative
 -
 - profiles tendency can be described by a self-standing class of indicators:
 - Parameters of classic laws fitted to the profiles, when applicable
 - Other empirical descriptions
- This class of indicators can be compared with usual bibliometric measures with a similar rationale, such as relative impact

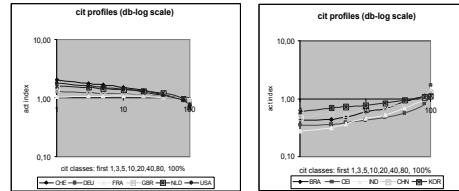
University Y, Eng sciences, direct and cumulative profiles, window 3



Learning from macro-level (countries) observations

- Macro-level observations (global and national systems) are helpful at least for a methodological detour:
- phenomena are more regular and more amenable to modeling
- no gap: scale of small countries systems and of big mainstream institutions is similar

Some country profiles



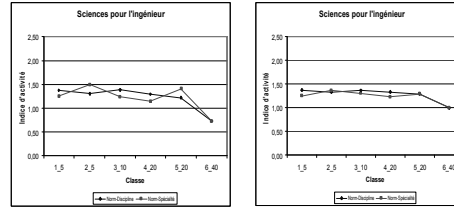
Some conclusions of macro-level observations

- Low level citations (not only the zero class) exhibit an irregular behavior:
 - heterogeneous content: national-oriented literature, "transfer literature", low prestige journals, causing changes in magnitude of classic performance indicators
 - publishing in this literature may be a constraint but also an occasional choice, including for visible scientists
 - models able to encompass this range would be exceedingly specific
- This literature can be estimated between 40 and 60 % of all published articles, beyond the non-cited literature in most settings.
- Then starts the range of competitive literature, which the main interest for national and institutional benchmarking
- However, within this competitive literature, the very high level of citation performances can be singled out, since sometimes not in line with the rest of the distribution. Indicators have then to cope with three different literatures.

Results transposable to institutional assessment

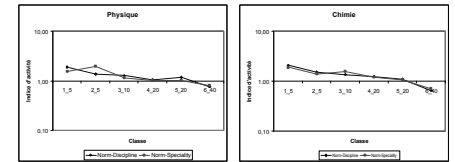
- Indicators based on the competitive range of literature (with or without additional specification of "super-excellence") should be privileged. They include:
 - classic indicators (relative impact) on database truncation
 - profile tendencies: parameter of appropriate models – fitted or approximated slopes: for small scale actors, modeling is hardly possible
 - extensive analysis of relations between profile indicators and classic indicators is in process
- Indicators about presence in visible range vs. non competitive range are a different thing, and sometimes depending on publication policy as well as performance
- Scale effects (choice of normalization sets) can be quite important, for example "excellence" measures are highly sensitive to normalization choices

University Y, Eng sciences, direct and cumulative profiles, window 3



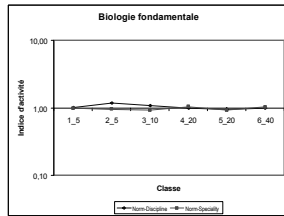
- Lower-class avoidance, as most mainstream countries universities
- But almost flat elsewhere: modeling the whole range is misleading as to competitiveness

Univ. X, Physics and Chemistry, direct profile, window=3



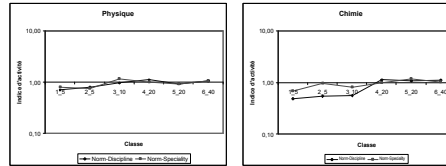
- "sound" descending profile in both disciplines

Univ. Z, Mathematics, direct profile, window=3



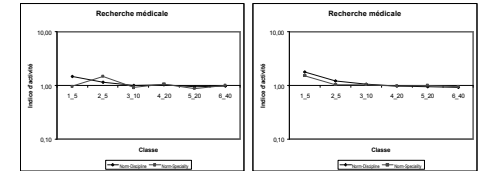
→ Example of rather flat profile, including for low-cited class

Univ. V, cumulative profile, Physics / Chemistry, window=3



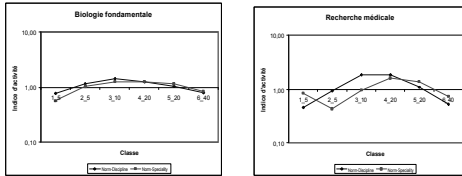
→ Ascending profile, sign of weakness
 → Sensitivity to normalization level (chemistry)

Univ T, Medical Res, direct profiles, window=3 / Univ Z, idem



→ Little relief but for excellence
 → No drop in the last class

Univ U, Fund. Biology / Univ W, Medical Res. window=3



- Atypical profile, reverse U shaped, deficit both in excellence and low-cited literature
- Again sensitivity to normalization level

Three literatures: consequences on institutional assessment indicators

The scrutiny of citation profiles shows that relative involvement in competitive literature (e.g. part of activity not devoted to the less visible fraction) on the one hand, and competitiveness in the visible fraction, are two different features. The hypothesis is confirmed by statistical analysis, however it needs to be corroborated on large populations of actors.

- The further specification of presence in excellence and "super-excellence", is justified since even for large actors, prediction from simple models are hardly useful, especially at the institutional level.

Emphasis on competitive research also motivates some "best of" indicators, such a h-index at the individual level. However, profiles indexes and h-index are quite different in focus and constraints.

Discussion and conclusion

Scrutiny of citation profiles is appealing to go round shortcomings of indiscriminating "global" (whole-range) indicators, which may be misleading for estimating competitiveness by relative impacts. Indicators with some robustness vis-à-vis the range and the database delimitation are neither publications nor impact data, but citation volume or citation market share.

- Separate analysis should be made for competitive research, possibly with a further specification of "super-excellence", and for the parting between competitive research and lowly visible research. Determining the boundaries of "competitive literature", which may be field-dependent, is open to discussion.
- The choice of reference sets for normalization also matters: several points of view should be accepted
- Comparison of indicators based on profiles tendency, and corresponding usual indicators such as relative impact, is appealing.

Bibliometrics in the observatory matrix

Acad.outcome 3rd mission

Autonomy	Res portfolio:	act. & Partnership in Euro. Program		
Strategic capabilities	Leverage-prescription:	Part in Intl Prog Excellence meas.	Leverage-prescription in tech and sci-tech	Part in Intl Prog Excellence meas.
Attractiveness	Attr. for researchers and students	Contrib to individual trajectory meas	Res collab. With non-academic	Collaboration (sci.:firms/ IP) IP Co-activity
Differentiation on profile	Field spectrum Article-type Other (books...)	Field structure of pub. and citations	Main points of collaboration	Field structure of IP activity
Terr. embedding	Geog. Dimension of sci. networks	Collab or cit.: Structure and network	Geog. Dimension of tech or sci-tech networks	Collab or cit.: Structure and network

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