

Metrics for research performance in Japan

How can we analyse our research performance by institution and by scientific research area?

Snowball Metrics and the UK experience

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Landscape of initiatives

UK examples



Global examples



STAR METRICS™
A Federal Collaboration with Research Institutions



ACADEMIC RANKING OF WORLD UNIVERSITIES
SINCE 2003

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Why did 8 top UK universities decide to create Snowball metrics?



Growing recognition of the value of data/metrics to inform and monitor research strategies, to complement but not replace existing methods

“Unless you have [data] you cannot make informed decisions; you would be acting based on opinions and hearsay.”

“[There is little] thought leadership and knowledge development around best practice.”

Frustration over the lack of a comprehensive but manageable standard set of metrics for sensible measurements

Frequent similar data requests from external bodies looking at performance in a way that is not necessarily of most value to universities themselves

“The principle drivers for our systems are often external but they shouldn’t be. A research strategy should... be developed to respond to our strengths and the external environment.”



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Benchmarking or ranking?



Rankings are compiled by various providers; each creates relative positions based on certain weightings – some even allow a university to choose weightings to create their own ranking. Unsurprisingly, a Rector chooses the ranking in which his university comes out best to market the university to new students

Benchmarking has a very different purpose and is a precise activity which measures activity (e.g. funding, outcomes such as impact etc) through the use of carefully defined **metrics**

The Snowball partner universities believed that there was no robust methodology for benchmarking

Snowball Metrics enable accurate **benchmarking** to drive quality and efficiency across higher education’s research and enterprise activities, regardless of system and supplier

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Snowball Metrics enable robust, university-driven benchmarking



Universities need standard metrics to benchmark themselves and know their position relative to peers, so they can strategically align resources to their strengths and weaknesses

Snowball Metrics UK Project Partners



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Snowball Metrics approach



- **Bottom-up initiative:** universities define and endorse metrics to generate a **strategic dashboard**. *The community is their guardian*
- Draw on all data: **university, commercial and public**
- Ensure that the metrics are **system- and tool-agnostic**
- Build on **existing definitions and standards** where possible and sensible

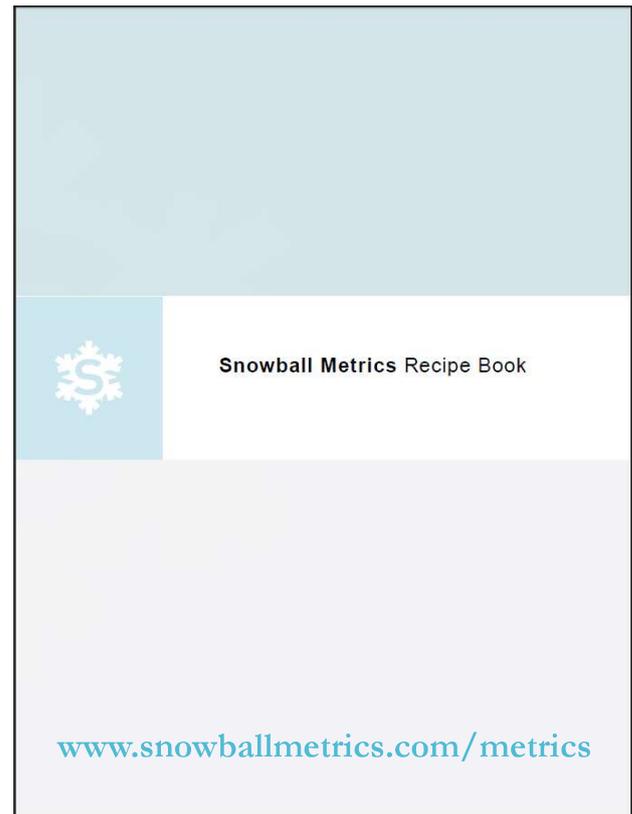
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The output of Snowball Metrics

“Recipes” – agreed and tested metric methodologies – are the output of Snowball Metrics

From Statement of Intent:

- Agreed and tested methodologies... are and will continue to be **shared free-of-charge**
- **None of the project partners will at any stage apply any charges for the methodologies**
- **Any organization can use these methodologies for their own purposes, public service or commercial**



Statement of Intent available at <http://www.snowballmetrics.com/wp-content/uploads/Snowball-Metrics-Letter-of-Intent.pdf>

Snowball Metrics delivered

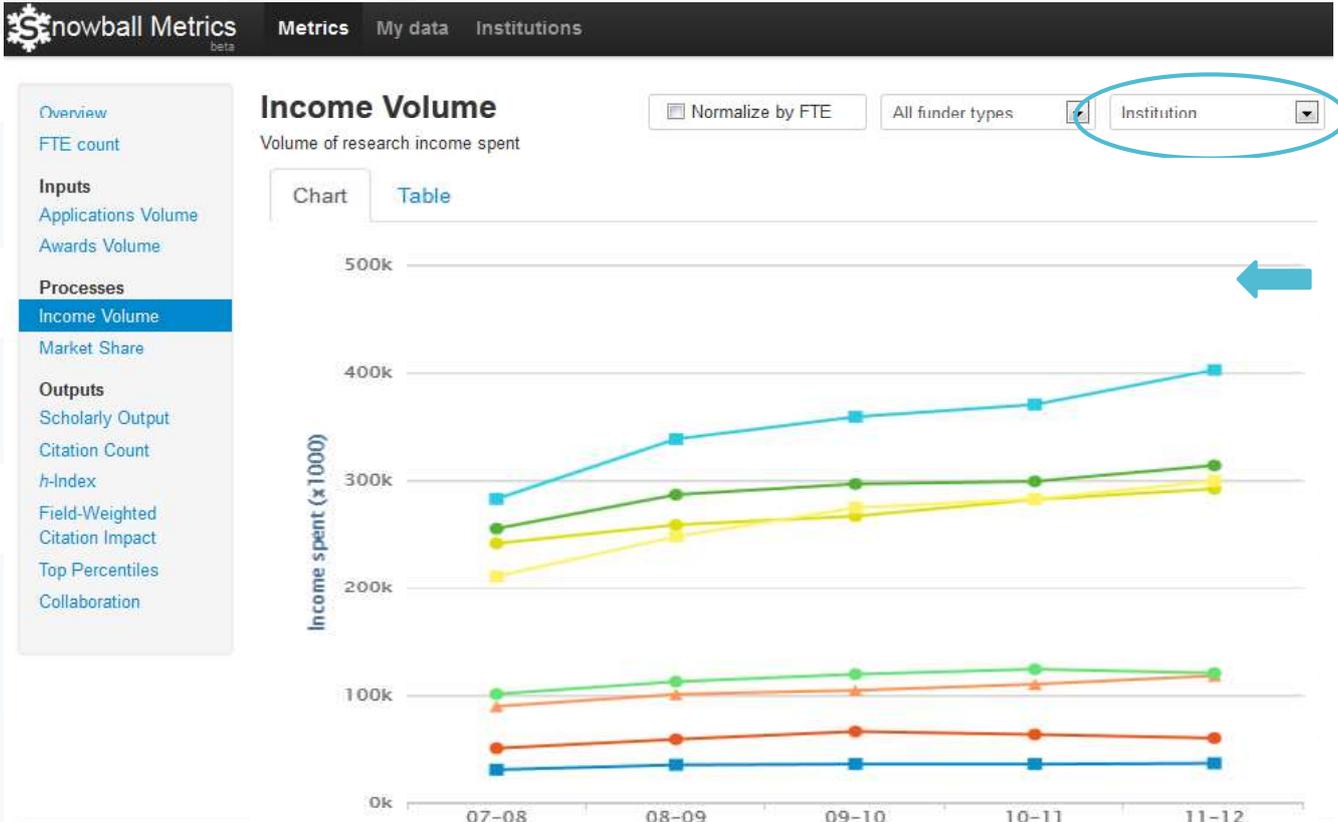
New recipes and denominators to be added to 3rd recipe book

	Research Inputs	Research Process	Research Outputs and Outcomes
Research	<ul style="list-style-type: none"> • Applications Volume (enhancement) • Awards Volume (enhancement) • Success Rate 	<ul style="list-style-type: none"> • Income Volume • Market Share 	<p>Publications and citations</p> <ul style="list-style-type: none"> • Scholarly Output (enhancement) • Citation Count • Citations per Output • <i>h</i>-index • Field-Weighted Citation Impact • Outputs in Top Percentiles • Publications in Top Journal Percentiles <p>Collaboration</p> <ul style="list-style-type: none"> • Collaboration • Collaboration Impact • Collaboration Field-Weighted Citation Impact • Collaboration Publication Share • Academic-Corporate Collaboration • Academic-Corporate Collaboration Impact <p>Impact</p> <ul style="list-style-type: none"> • Altmetrics • Public Engagement • Academic Recognition
Enterprise Activities/Economic Development	<ul style="list-style-type: none"> • Academic-Industry Leverage • Business Consultancy Activities 	<ul style="list-style-type: none"> • Contract Research Volume 	<ul style="list-style-type: none"> • Intellectual Property Volume • Intellectual Property Income • Sustainable Spin-Offs (enhancement) • Spin-Off-Related Finances
Postgraduate Education	<ul style="list-style-type: none"> • Research Student Funding 	<ul style="list-style-type: none"> • Research Student to Academic Staff Ratio 	<ul style="list-style-type: none"> • Time to Approval of Doctoral degree • Destination of Research Student Leavers

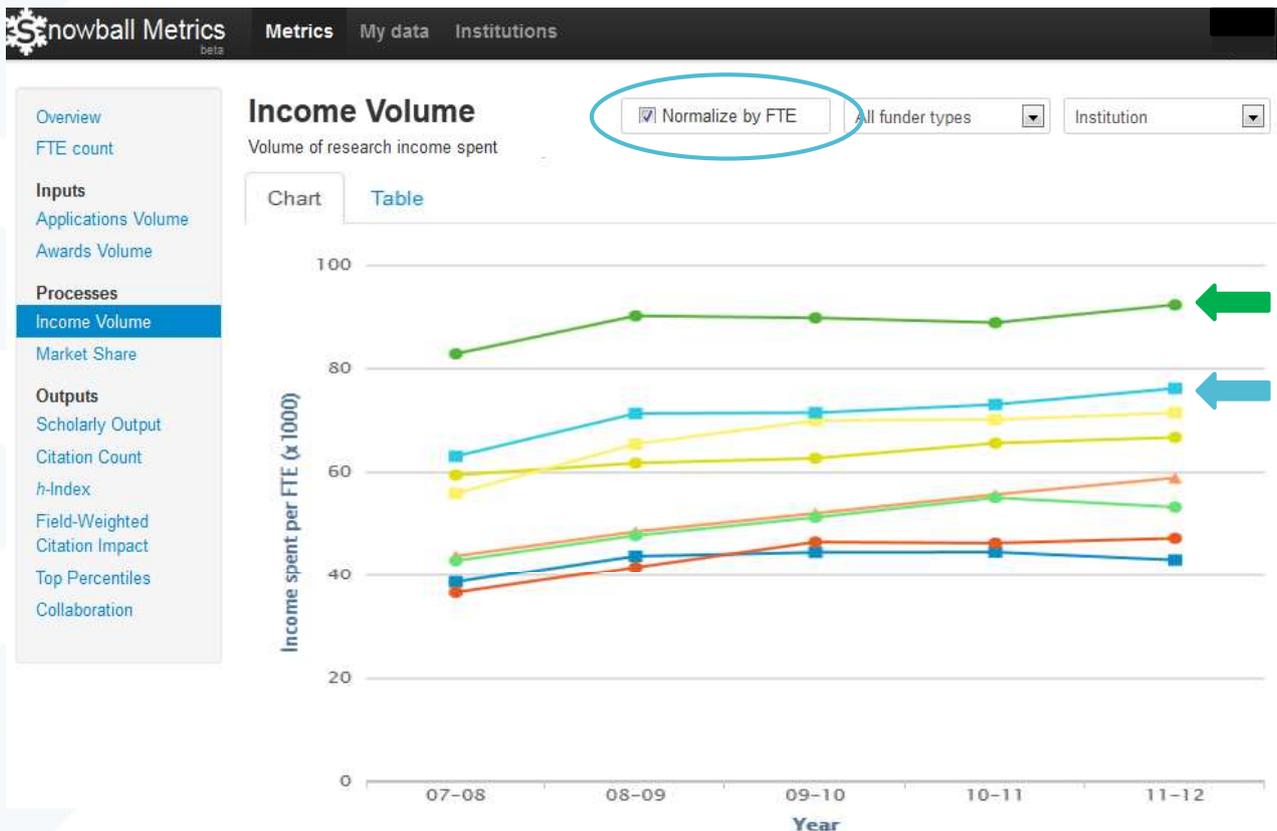
Denominators

Institution (enhancement)
 Discipline (enhancement)
 HESA cost centre – HERD mapping
 HESA funder types – FundRef mapping
 Funding type
 Post-graduate research student, and FTE proportion
 Gender

How do Snowball metrics help universities align their strategies to their strengths and weaknesses?



Metrics can be size-normalized





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Globalizing Snowball Metrics

Interest and support from:

- **US** Michigan, Northwestern University, University of Illinois at Urbana-Champaign, Arizona State, MD Anderson, Kansas State
- **ANZ** Queensland, Western Australia, Auckland, Canberra
- Japan in 2013
- **APRU** Association of Pacific Rim Universities
- **HKU & NTU**
- European Commission for H2020
- Fundação para a Ciência e a Tecnologia (FCT) in Portugal
- Sweden
- Denmark

So do metrics help?

- It's not all metrics, or no metrics – it's not a black and white decision
- Metrics can provide data points on which to build using expert opinion (peer review) to delve deeper & deal with outliers
- Metrics aren't a replacement for human judgment – they complement it
- Metrics aren't the antithesis of peer review
- (Biblio)-metrics incorporate decisions made by peer review, e.g. whether to publish, what to cite
- But metrics aren't just bibliometrics – there are many measures that can and should be used
- We value objective normalized universal information that enables meaningful comparisons
- After all academia is an evidence-based activity!
- First define the question; then pick the metrics to answer them

UK REF (& new TEF) is now moving towards an increasing reliance on metrics

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The challenges we have overcome Snowball Metrics

- Data sources (public, internal, commercial)
- Combining institutional, third party and proprietary data
 - inconsistency
 - testing
- Recognition that system / supplier agnostic
- Trust
 - between the partner universities e.g. data sharing, data weaknesses
 - between universities and Elsevier
- Confidentiality
- Engaging with the appropriate people in the partner universities
- Confusion over recipes and their use in products

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Why is Cambridge committed to Snowball?



Malcolm Edwards, now *Director of Strategic Planning, Imperial College London*, previously *Head of Planning and Resource Allocation, Cambridge*:

- 'Recipes' designed by us, for us
- Our data
- Broad portfolio of data – not all about bibliometrics
- Possibility of benchmarking clubs – sharing metrics, not sharing data
- A peer-to-peer approach works for us – and we believe it can work for other universities, and for policy makers and funders
- Uptake is the key challenge

What benefits have Imperial College London seen?



- Understanding strengths and weaknesses
- Understanding competitors and identify our peer group
- Recruitment of faculty
- Developing strategies to focus resource and collaborate
- Increasing selective strategy (Global Themes)
- Improving research income & outputs
- Strategic approach

Some real examples

- Decrease in neuroscience income
- Recruiting a new professor
- Divestment of an institute

- Trusted comparison of metrics on a robust standard (comparing apples to apples)
- Universities are in control
- Methods (recipes) are not proprietary
- Metrics are agnostic to systems or suppliers
 - anyone can use them for their own purposes
- Ability to choose and control with whom one shares /benchmarks (the crossroad/traffic light model)
- Ability to benchmark nationally and internationally

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If Japan universities want to explore metrics ...

- Work bottom-up
- Have a manageable group of universities working together
 - need those who are willing to work at it (it took us 5 years 😊)
- Involve an organisation which can test the metrics
- UK universities are not very good at managing projects
- Need high level Steering Group (to ensure buy-in from the top)
- Need data experts from within universities
- AND... a project group which “does the work”
- Need to get buy-in from all parts of the sector: funders, government, researchers ...
- Leverage the work others have done (Snowball !! 😊)
- Trust each other

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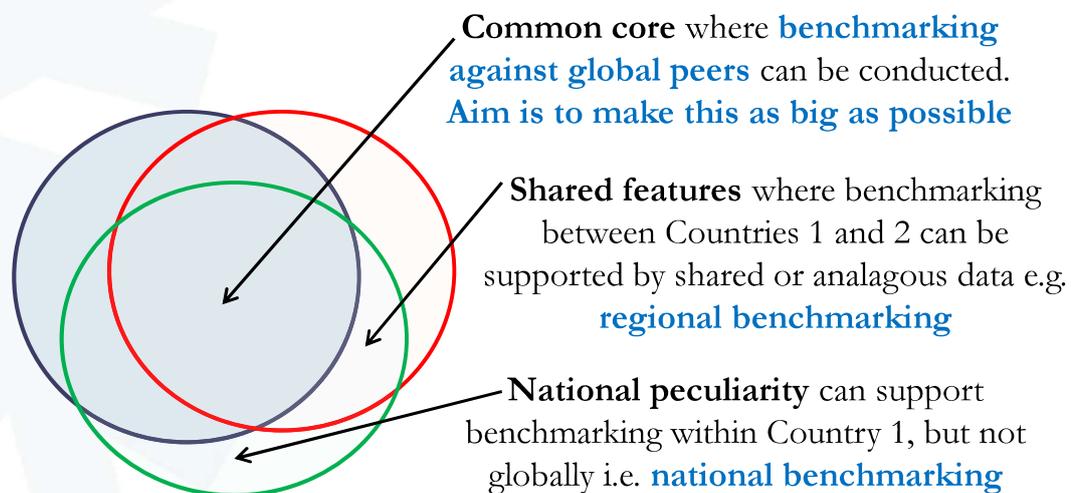
Snowball Metrics <http://www.snowballmetrics.com/>



Towards global standards for benchmarking



Snowball Metrics denominators should enable global benchmarking as far as possible. We do not know how this will look, but one possibility is:



UK metrics

Japan metrics

Australia / New Zealand metrics

Illustrative only,
testing underway

Snowball metrics exchange

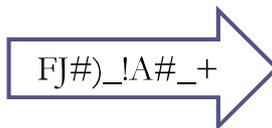
Data sources inputs



InCites
SciVal
Symplectic
Pure
Converis
spreadsheet

Scholarly output = 1,376

Snowball Metrics eXchange



Data sources outputs



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Snowball Metrics exchange

- **Any institution** who is using Snowball Metrics can **become a member** of the exchange
- Institutional members are responsible for generating Snowball Metrics **according to recipes**
- An institution could be the member of **one or more 'Benchmarking clubs'**
- Institutions **choose what to share**
- Exchange service **encrypts all metrics** and only **entitled institutions** can **decrypt**
- **Data** underlying metrics will **never be exchanged**
- **CRIS system** could act as **provider** and **client**, communicating directly with exchange APIs

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