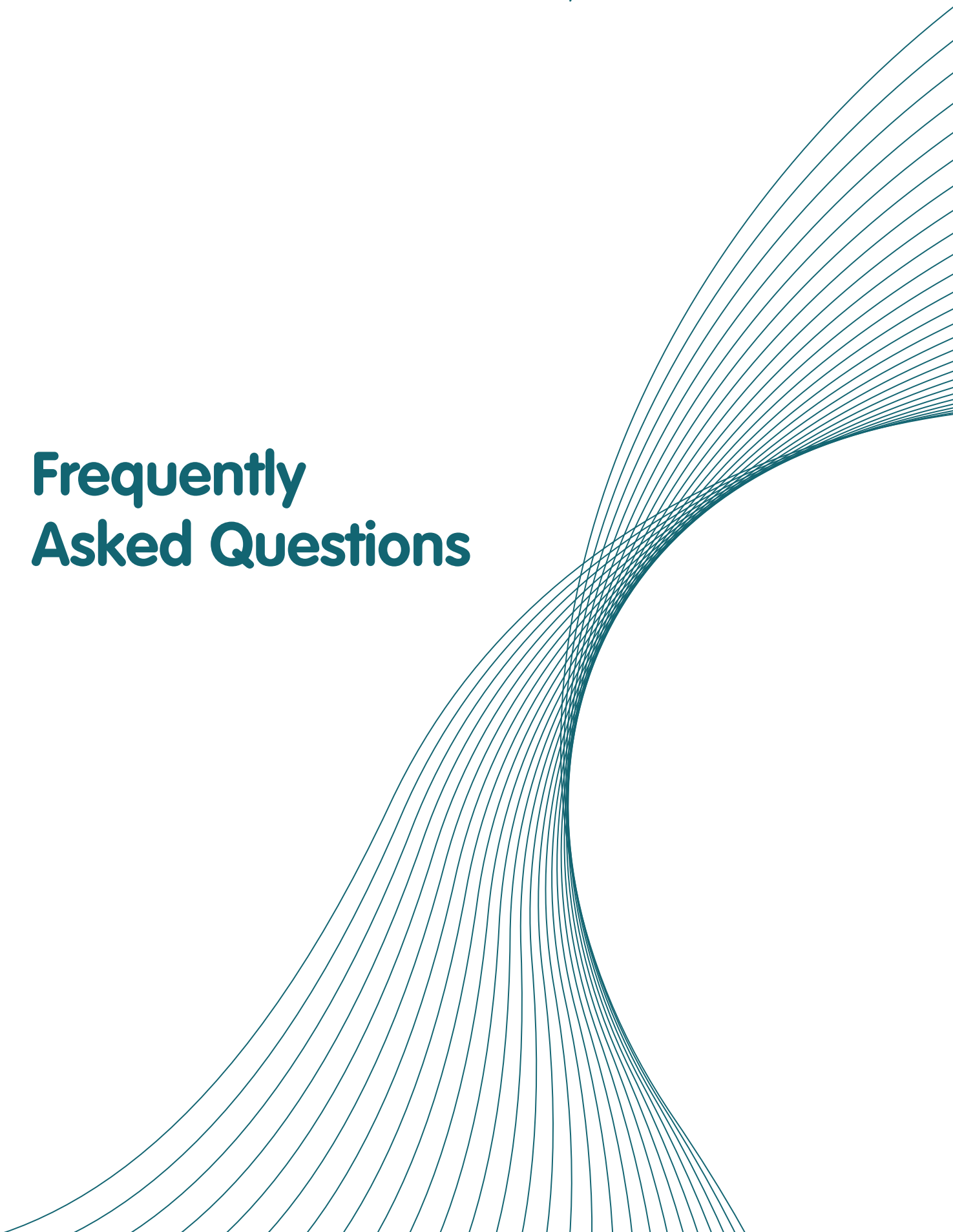


# Frequently Asked Questions



# Contents:

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## A. General questions about journal metrics

1. What are journal metrics?
  2. What is SNIP?
    - SNIP in one sentence
    - SNIP – a short summary
  3. What is SJR?
    - SJR in one sentence
    - SJR – a short summary
  4. Who are these new metrics for?
  5. Who developed these journal metrics?
- 

## B. How do SNIP and SJR compare with other journal metrics

6. What are the main advantages and weak points of SJR and SNIP in relation to the Impact Factor?
  7. How does the SJR differ from the Eigenfactor?
  8. How does SJR differ from Google PageRank?
  9. When should we best use SJR and SNIP, rather than the Impact Factor?
  10. When should we best use SJR or SNIP?
    - Guidelines on when to consider SJR
    - Guidelines on when to consider SNIP
- 

## C. How is SciVerse Scopus involved?

11. Why did you incorporate journal-ranking metrics in Scopus?
  12. What alternatives did the Scopus team create, and how?
  13. Why release two indicators at the same time?
  14. Why did you stop at two metrics? Why not more?
  15. How did you select SNIP and SJR?
  16. Why don't you include the h-index?
  17. Will Scopus provide journal rankings?
  18. What impact will this have on the science publishing industry?
- 

## D. How and when the metrics are calculated in Scopus

19. For which source types will metrics be calculated?
  20. How will Scopus handle new journals?
  21. How will Scopus handle discontinued journals?
  22. How will Scopus handle name changes ('formerly known as' or 'continued as')?
  23. How does Scopus handle splits, spin offs and mergers?
  24. For which years are metrics available?
- 

25. When will metric values be refreshed?
26. What exactly will be published when you refresh the data?
27. How do SJR and SNIP handle journal self-citations?
28. What is the effect of increasing journal self-citation on increasing SJR and SNIP values?

The prestige that a journal transfers when it cites another journal is equal to its SJR for that year, and yet citing is used to generate the SJR. This seems very circular – how does it work?

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## E. How to use the metrics and understand the results

29. Can I view SJR and SNIP by subject classifications?
  30. Why might a journal in Scopus not have a metric for a particular year?
  31. Are SNIP values for individual titles comparable between years? I am not sure because each year is normalized to its own median journal's Citation Potential
  32. How can I increase my journal's SJR and SNIP?
  33. Why is this result (value/rank etc) different from the Impact Factor?
  34. With the Impact Factor, you can make a good article have a bit more influence on the value by publishing it in January instead of in December. Is this true for SJR and SNIP?
  35. My journal's SNIP value/rank shows a sudden drop. Why?
  36. There are some discrepancies between previous years' SNIP values published in January 2010 and refreshed later in 2010 that seem rather large. What has happened?
  37. My journal's SJR value/rank appears to be falling. Why?
  38. When should I use SJR and SNIP, rather than the Impact Factor?
  39. When should I use SJR or SNIP?
    - Guidelines on when to consider SJR
    - Guidelines on when to consider SNIP
  40. Can you export the metrics from the Scopus Journal Analyzer?
  41. In Scopus Analytics, do the documents, citations and % not cited tabs refer to the SJR and SNIP citation windows?
- 

## F. Further information

42. Are other publishers allowed to display these metrics?
43. Where can I go for more information?

# A. General questions about journal metrics

## 1. What are journal metrics?

Journal metrics measure the performance and/or impact of scholarly journals. Each metric has its own particular features, but in general, they all aim to provide rankings and insight into journal performance based on citation analysis. They start from the basic premise that a citation to a paper is a form of endorsement, and the most basic analysis can be done by simply counting the number of citations that a particular paper attracts: more citations to a specific paper means that more people consider that paper to be important. Citations to journals (via the papers they publish) can also be counted, thus indicating how important a particular journal is to its community, and in comparison to other journals. Different journal metrics use different methodologies and data sources, thus offering different perspectives on the scholarly publishing landscape, and bibliometricians use different metrics depending on what features they wish to study.

## 2. What is SNIP?

### SNIP in one sentence

Source-Normalized Impact per Paper (SNIP) corrects for differences in the frequency of citation across research fields.

### SNIP – a short summary

SNIP, or Source-Normalized Impact per Paper, measures a source's contextual citation impact. It takes into account characteristics of the source's subject field, especially the frequency at which authors cite other papers in their reference lists, the speed at which citation impact matures, and the extent to which the database used in the assessment covers the field's literature. SNIP is the ratio of a source's average citation count per paper, and the 'citation potential' of its subject field. It aims to allow direct comparison of sources in different subject fields.

A source's subject field is the set of documents citing that source. The citation potential of a source's subject field is the average number of references per document citing that source. It represents the likelihood of being cited for documents in a particular field. A source in a field with a high citation potential will tend to have a high impact per paper.

Citation potential is important because it accounts for the fact that typical citation counts vary widely between research disciplines – they tend to be higher in Life Sciences than in Mathematics or Social Sciences, for example. If papers in one subject field contain on average 40 cited references while those in another contain on average 10, then the former field has a citation potential that is four times higher than that of the latter. Citation potential also varies between subject fields within a discipline. For instance, basic journals tend to show higher citation potentials than applied or clinical journals, and journals covering emerging topics tend to have higher citation potentials than periodicals in well established areas.

For sources in subject fields in which the citation potential is equal to the average of the whole database, SNIP has the same value as the 'standard' impact per paper. But in fields with a higher citation potential – for instance, a topical field well covered in the database – SNIP is lower than the impact per paper. In fields in which the citation potential is lower – for instance, more classical fields, or those with moderate database coverage – SNIP tends to be higher than the impact per paper. In this way, SNIP allows you to rank your own customized set of sources, regardless of their subject fields.

## 3. What is SJR?

### SJR in one sentence

SCImago Journal Rank (SJR) reflects the prestige or status of the citing source: the value represents weighted citations per document.

### SJR – a short summary

SJR, or SCImago Journal Rank, is a measure of the scientific prestige of scholarly sources.

SJR assigns relative scores to all of the sources in a citation network. Its methodology is inspired by the Google PageRank algorithm, in that not all citations are equal. A source transfers its own 'prestige', or status, to another source through the act of citing it. A citation from a source with a relatively high SJR is worth more than a citation from a source with a lower SJR.

A source's prestige for a particular year is shared equally over all the citations that it makes in that year; this is important because it corrects for the fact that typical citation counts vary widely between subject fields. The SJR of a source in a field with a high likelihood of citing is shared over a lot of citations, so each citation is worth relatively little. The SJR of a source in a field with a low likelihood of citing is shared over few citations, so each citation is worth relatively much. The result is to even out the differences in citation practice between subject fields, and facilitate direct comparisons of sources.

SJR emphasizes those sources that are used by prestigious titles. SJR allows you to rank your own customized set of sources, regardless of their subject fields.

## 4. Who are these new metrics for?

Scopus incorporated SNIP and SJR into the Scopus database because bibliometricians, editors, researchers, librarians, and many others in academia said they wanted free, transparent alternatives for ranking journals. Please see the Vision section at [www.journalmetrics.com](http://www.journalmetrics.com). We believe the incorporation of SNIP and SJR in Scopus, and making our Scopus data available to SNIP and SJR to calculate the values, brings the following benefits to specific groups:

- Bibliometricians: SNIP and SJR provide alternative values that can assist bibliometricians create more refined and objective analyses. This can include:
  - Measuring the quality of the research output of universities (research performance)
  - Helping governments/universities allocate research funding.
- Editors: SNIP and SJR help editors evaluate their journal and understand how it is performing compared to its competition. SNIP and SJR provide more contextual information, and can give a better picture of specific fields, such as Engineering.
- Researchers: SNIP and SJR can help all academics identify which journals are performing best within their subject field so they know where to publish.
- Everyone: SNIP and SJR values are updated twice a year, providing an up-to-date view of the research landscape.

## 5. Who developed these journal metrics?

SNIP: Professor Henk Moed, formerly based at University of Leiden, developed the Source-Normalized Impact per Paper at CTWS (University of Leiden, the Netherlands). Please see:

- 'Measuring contextual citation impact of scientific journals' <http://arxiv.org/abs/0911.2632>
- SNIP information website [www.journalindicators.com](http://www.journalindicators.com)
- Both papers can also be downloaded from the [journalmetrics.com](http://www.journalmetrics.com) site.

SJR: Professors Félix de Moya, Research Professor at Consejo Superior de Investigaciones Científicas, and Vicente Guerrero Bote at University of Extremadura developed SCImago Journal Rank (SJR). Please see:

- 'The SJR indicator: A new indicator of journals' scientific prestige' : <http://arxiv.org/abs/0912.4141>
- SCImago journal and country rank website: [www.scimagojr.com/](http://www.scimagojr.com/)
- Both papers can also be downloaded from the [journalmetrics.com](http://www.journalmetrics.com) site.

Scopus provides raw data to SNIP and SJR, and provides access to these journal metrics, both on [www.journalmetrics.com](http://www.journalmetrics.com) and in Scopus Journal Analyzer. FAQs on How Scopus is involved are below. Also, please see our Vision section and Scopus links on [www.journalmetrics.com](http://www.journalmetrics.com) for more information.

# B. How do SNIP and SJR compare with other journal metrics?

All journal metrics calculate journal prestige in different ways, and each has specific strengths and weaknesses. A comparison table with all the major journal metrics is available in our White Paper, available in the resource library of [www.journalmetrics.com](http://www.journalmetrics.com)

## 6. What are the main advantages and weak points of SJR and SNIP in relation to the Impact Factor?

### Advantages

- Transparency – calculated from a database that you can see, so you can check the numbers. The Impact Factor database is hidden away within Thomson – it is not calculated from the Web of Science
- Subject field normalization
  - Life Sciences journals have huge Impact Factors compared to Math journals, which reflects different citation behaviors between fields, not quality.
  - Even within one subject field, there can be different citation behaviors, making it difficult to know if a difference in Impact Factor is due to quality or behavior. Compare basic and applied journals, for example.
  - SJR and SNIP take this difference in behavior into account in the way they are calculated, so you don't have to worry about which field your journal is in – you can just construct your own set of journals and rank within it.
  - An added benefit is that the way SJR and SNIP account for subject field differences is independent of the source classification in Scopus. Even if a journal has recently changed scope, making its classification outdated, the field used to correct for subject differences will, nevertheless, reflect its current scope because the journal makes its own subject field based on what it is cited by.
- Three-year citation window
  - The 'citation window' is the number of years of content that a metric is based on.
  - Both SCImago and CWTS use a three-year citation window for their journal metrics. They demonstrate that this window is the fairest compromise for a broad-scope database like Scopus and that it includes the citation peaks of the majority of fields. The graph below illustrates this point. It is taken from a paper published by the SCImago research group: 'What lies behind the averages and significance of citation indicators in different disciplines?' <http://jis.sagepub.com/content/36/3/371> short by Bárbara S. Lancho-Barrantes, Vicente P. Guerrero-Bote and Félix Moya-Anegón, Journal of Information Science, June 2010; vol. 36, 3: pp. 371–382.
  - Thomson Reuters publishes two versions of the Impact Factor – with two- and five-year citation windows. A two-year citation window favors rapidly moving fields and may be unfair to slower moving fields. Five years is often considered the best compromise, although it favors slower moving fields, and may be biased against rapid fields
- Manipulation-resistant
  - It is relatively easy to manipulate the Impact Factor because it is generated from citations from all content – including non peer-reviewed content like editorials.
  - SNIP and SJR only consider citations made by peer-reviewed content and directed to peer-reviewed content. It is also much more difficult to interfere with peer-reviewed content.
  - Peer-reviewed content in Scopus = articles, reviews and conference papers.
- Breadth of coverage – not all journals have Impact Factors, yet librarians and scientists need values for all the journals they work with. Scopus' much broader coverage means that this is no problem for SJR and SNIP.

## Weak points

- The calculation method is more complicated than the Impact Factor. Any attempt to normalize across subject fields necessarily results in more complex algorithms. You cannot have this feature and simplicity as well.
- They do not address the bias of review articles. This is not always a problem, but in some situations it can be:
  - Review journals, or original research journals with a high proportion of review content, tend to have higher Impact Factors than purely original research journals in the same field because reviews tend to be more heavily cited than original research.
  - Impact Factor, SNIP and SJR do not compensate for this, so review or review-rich journals tend to have higher Impact Factor, SJR and SNIP.
  - **Note:** It is possible to see the proportion of review content in Scopus by looking at the documents for a particular journal. This means you can assess the impact such reviews might be having. In Scopus Journal Analytics simply click on the 'Percent reviews' tab to see the proportion of review content. This means you can better assess the strength of a particular journal.
- The numbers need to be understood in context.
  - An Impact Factor of two means an average of two citations per article/review published in that journal.
  - SJR is based on a random-walk model. It calculates the percentage of time a researcher would spend reading content from each journal if they randomly followed references from one article to another. An SJR of two means that two percent of the researcher's time is spent reading this particular journal.
  - A SNIP value that is higher than one means that the journal has an above average SNIP for its field. A SNIP that is lower than one means that the journal has a below average SNIP for its field. If SNIP = 1, the journal is absolutely average for its field.
  - SJR and SNIP values make sense within the context of values for other journals. They are just a way to put journals in order.

- The range that SJR and SNIP cover (about 0 to 10) is smaller than the range of the Impact Factor (about 0 to 60). As a result, some journals will have higher SNIP and SJR values than the Impact Factor and for others it will be lower.
- A possible disadvantage in some situations for SNIP: If a journal is cited by Nature in one year, this will increase its citation potential, and reduce its SNIP value. Citation potential tends to be highest for topical journals, so if your journal is becoming more topical, it is likely to end up with a higher citation potential and will need more citations to compensate (more or less the definition of being topical). But remember that SNIP and SJR are complementary, and SJR will 'reward' a journal for a citation from a high prestige (topical) journal.
- A possible disadvantage in some situations for SJR: If a journal is often cited by low prestige (low SJR) journals, it might not get as much credit as you would expect from the extra citations. Low prestige journals will tend to be less topical and have a lower citation potential, so if this is a problem you may choose to use the complementary metric SNIP instead.

## 7. How does the SJR differ from the Eigenfactor?

Both are 'prestige metrics', and follow the type of approach used by Google PageRank, but the method of calculation has some differences:

- Eigenfactor excludes all journal self-citations. SJR only excludes journal self-citations above 33% of the total received by a journal.
- Prestige metrics like SJR and Eigenfactor treat journals as a network linked together by their citations. These networks contain 'dangling nodes' – journals that have cited other journals, but have not received citations themselves. These dangling nodes can be handled in different ways:
  - Eigenfactor discounts them. If a journal has not received any citations, then the citations it makes have no value. The result is that not all journals in a database have an Eigenfactor value.
  - SJR gives all citations from peer-reviewed content a value, whether or not the source has received citations itself. As a result, all journals in the database have a value.
- Eigenfactor uses a five-year citation window; SJR uses a three-year citation window.
- Eigenfactor is calculated based on the publicly unavailable Journal Citation Reports database. SJR is powered by Scopus.
- **Note:** the proper comparison is between Article Influence and SJR. Eigenfactor tracks citation power (all citations received by a journal), so bigger journals tend to have higher Eigenfactors. Article Influence is Eigenfactor / number of documents.

## 8. How does SJR differ from Google PageRank?

Google PageRank is derived from a similar philosophy to SJR and Eigenfactor. Values can be derived from a linked network in which elements have reciprocal links. These links have different values depending on where they come from. But there are some differences:

- In Google PageRank, value (prestige) is derived from the number of incoming hyperlinks. For SJR it is the number of incoming citations.
- Google PageRank rounds everything to an integer between 1 and 10; SJR uses a continuous scale.
- Google PageRank is open to manipulation because a hyperlink is a hyperlink. SJR can distinguish between citations based on the document type that they come from, making it highly resistant to manipulation.
- Google PageRank does not apply a 'hyperlink window' – it counts total incoming hyperlinks on the day it is calculated. SJR applies a three-year citation window.
- Google has not disclosed details of how it generates a toolbar PageRank value. SCImago have published a peer-reviewed article with details of the calculation method.

## 9. When should we best use SJR and SNIP, and not Impact Factor?

- For journals that do not have Impact Factors
- When subject field differences may affect ranking, and not only quality
- When comparing basic and applied journals
- When investigating multidisciplinary fields; e.g. in SciVal Spotlight

## 10. When should we best use SJR or SNIP?

- The following are guidelines and not hard and fast rules. They are taken from:

'SJR and SNIP: two new journal metrics in Elsevier's Scopus' <http://dx.doi.org/10.1629/23215>

### Guidelines on when to consider SJR:

- To enhance position of post-prestigious journals (SJR emphasizes the differences).
- If focusing on Life and Health Sciences.
- If topicality is important in journal performance.
- If you want to weight citations based on the status of the citing journal.

### Guidelines on when to consider SNIP:

- If value is less important than rank (SNIP reduces the differences).
- If focusing on Engineering, Computer Science, and Social Sciences.
- If you are focused on subject field normalization.
- If you think that impact and topicality are separate and should be considered independently.

# C. How is SciVerse Scopus involved?

Scopus provides raw data to SNIP and SJR, and provides access to these journal metrics. FAQs on How Scopus is involved are below. Also, please see our Vision and Scopus pages on [www.journalmetrics.com](http://www.journalmetrics.com) for more information.

## 11. Why did you incorporate journal-ranking metrics in Scopus?

Metrics help researchers, librarians and decision-makers achieve their desired outcomes. Ultimately, our customers want to improve the quality and impact of research, whether they perform research, disseminate it or fund it. Through customer interviews, research studies and end-user focus groups, we have learned that various users, buyers and influencers use journal performance to answer a variety of questions, such as which journals to track, where to publish and how to evaluate research outcomes. Furthermore, we have noticed that the existing tools to compare journals do not fully meet the needs of the research community in terms of coverage, transparency and robustness.

For example, only journals covered in Thomson Reuters' Journal Citation Report have an Impact Factor: that's about 8,000. However, researchers want to compare more journals in their fields than just those listed by Thomson Reuters.

With its breadth of journal coverage, Scopus is well positioned to fulfill this need: Scopus covers more than 18,000 publications and thus enables researchers to compare practically any journal they want to on the basis of transparent, robust and fair metrics.

## 12. What alternatives did the Scopus team create and how?

Actually, the team did not create any of these metrics themselves. Bibliometrics is a scientific discipline in and of itself, and we would not be doing the right thing if we bypassed the merits of that scientific discipline by creating our own metrics. At the start of the project, we immediately realized it would not be good for the scientific community if we created our own metrics. Although we have the best intentions, the chosen metric would possibly be subject to criticism solely because we, as a primary publisher, are not strictly independent of the methodology by which journals are ranked. It could appear to be a conflict of interest, and such a debate would not truly serve the academic community.

We have partnered with researchers from the bibliometric community, such as Professor Henk Moed, then at Leiden University in the Netherlands, to identify the metrics that could best help researchers, librarians and decision-makers achieve their outcomes. In the end, we decided to initially implement two metrics: SJR and SNIP. However, we will continuously evaluate additional metrics for inclusion in Scopus based on their ability to answer our customers' questions.

## 13. Why release two indicators at the same time?

No matter what you are evaluating – journals, researchers, institutions, countries – one metric can never encompass all the aspects of performance that the different users and situations demand. One-dimensional evaluation is limiting, misleading, and will give questionable results. There is no single 'perfect' indicator of journal performance. As a publisher, we use multiple indicators, including revenue, usage, and the opinion of the editor, to help broaden our view on our own journals' performance and we are not alone.

For this reason, we felt that it would give the wrong message to release one metric. We could have endorsed any number above two, but the research we have done led us to believe that SJR and SNIP are a good complimentary pairing. The fact that Scopus endorsed two complementary measures (SNIP and SJR) reflects the notion that journal performance is a multidimensional concept.

## 14. Why did you stop at two metrics? Why not more?

We have not necessarily 'stopped at two', but we felt two was a good starting place. Please see other questions in this section for why we are releasing more than one metric and how we decided. Ultimately, there are a lot of indicators available that address different aspects of journal ranking. We wanted two that were representative, distinct from each other, and benefit from the Scopus database. The fact that Scopus incorporated SNIP and SJR should not detract from the core message that we believe you should use a wide range of indicators based on your specific requirements. There is a comparison table of the major metrics in our White Paper, downloadable from [www.journalmetrics.com](http://www.journalmetrics.com), under resource library.

## 15. How did you select SNIP and SJR?

We had some criteria in mind when we were considering which journal-ranking metrics we should include in Scopus:

- Enable multidimensional journal evaluation – i.e. one metric would not be a solution to the problem.
- Multiple metrics must highlight different aspects of journal performance – for instance, we would not include both SJR and Eigenfactor.
- Address user concerns with Impact Factor.
- Suitable to be calculated using Scopus data structure – we worked with bibliometricians to run test calculations for more than just SJR and SNIP.
- As many journals as possible indexed by Scopus should end up with metric values.
- Institutes and organizations involved in research and academic relations, including internal Elsevier departments, gave us valuable insights into journal performance.

### Criterion not considered:

- Perfect reconstruction of Impact Factor rankings.

## 16. Why don't you include the h-index?

We do provide access to the h-index in Scopus. Within Scopus, each journal is given an h-index value for each year of publication in its source details page. However, strictly speaking, the h-index is not a journal metric, and this is why it hasn't been included here.

## 17. Will Scopus provide journal rankings?

Our approach is not to provide fixed rankings, in the way that is done with the Impact Factor.

A major advantage of SJR and SNIP is that they normalize subject field differences by accounting for different citation behaviors. This means that you don't have to compare journals in the same field; you can analyze a customized set of journals and create your own rankings.

## 18. What impact will this have on the science publishing industry?

Fundamentally, it gives the scientific community more options for comparing journals – something it has been asking for. Comparison of journals, researchers and institutions has been part of science and science publishing since the very beginning; science has always been a competitive market that rewards excellence.

From the research we have done, we have learned that the scientific community wants to move away from one-dimensional analysis – such as a single Impact Factor for journals – towards increasingly multidimensional analyses to inform their decisions, such as funding. These metrics will ensure that they are better informed than in the past.

# D. How and when the metrics are calculated in Scopus

## 19. For which source types will metrics be calculated?

All active peer-reviewed source-types in Scopus will get metrics. The Scopus 'source browse' file includes journals, proceedings, and book series, but not trade journals. Only the peer-reviewed content within these peer-reviewed sources (articles, reviews and conference papers) is used to generate the metrics. For comparison, the Impact Factor is calculated using citations from all document types, whether peer reviewed or not.

## 20. How will Scopus handle new journals?

New could mean (i) newly launched and indexed journals, or (ii) already established but newly indexed by Scopus.

Scopus, and thus SNIP and SJR, have a significant timing advantage for new titles. Metrics will be produced as soon as data are available for one complete publication year and some of a citation year. This gives you a head start of between one and two years.

- i. New journal (indexed in Scopus at launch): SNIP and SJR can be calculated for a new journal launched in, say, 2010, when Scopus has content for 2010 and part of the 2011 citation year. This means a new journal gets a SNIP and an SJR value in the year after launch. For Impact Factor, a 2010 journal would get a 2011 Impact Factor, first published in June 2012. (Based on one year of content and one year of citations.)
- ii. Established journal (newly indexed in Scopus): This is the same as above. The first values will be published in the year after launch. So, if a journal is indexed in 2010, it gets 2011 values in 2011. For Impact Factor, this journal would get a 2012 Impact Factor, published in June 2013. (Based on two years of content and one year of citations.)

## 21. How will Scopus handle discontinued journals?

Metrics will be calculated for as long as data are available. For a journal discontinued in 2009, SNIP and SJR will produce values for 2010, 2011 and 2012, based on, respectively, three, two and one year(s) of content. As a natural consequence of lack of new data, no metrics will be produced for 2013.

**Note:** SJR and SNIP are based on a three-year citation window.

## 22. How will Scopus handle name changes ('formerly known as' or 'continued as')?

For journals that change their name, Scopus recognizes a relationship in the data between the former and new names so the link can be made. In Journal Analyzer, such journal titles are linked under the SJR and SNIP tabs to allow continuous ranking. This improves upon the Impact Factor where name changes are not linked. It takes three years for a journal to recover its Impact Factor after a name change because for the intervening two years, the citations and the resulting Impact Factor are shared over the two name versions.

**Note:** the Journal Analyzer tabs for citations, document and % not cited do not link old and new names yet.

## 23. How does Scopus handle splits, spin offs and mergers?

The journal(s) created by these activities are actually new titles, and will be handled as such.

**Split** – original title is not continued, and you get two (or more) new titles with new ISSNs. Metrics will continue to be calculated for the original title for three years after the split (treat as discontinued title). Metrics will be calculated for the newly split titles from the year following their first year of creation (treat as newly launched/indexed titles).

**Spin off** – original title and ISSN is continued, but a new related title and ISSN will be added. Metrics will continue to be calculated for the parent title without disruption. Metrics will be calculated for the new spin-off title(s) from the year following their first year of creation (treat as newly launched/indexed titles).

**Merger** – two or more titles are combined into one new title with a new ISSN. Metrics will continue to be calculated for the original titles for three years after the split (treat as discontinued titles). Metrics will be calculated for the new merged title from the year following its first year of creation (treat as newly launched/indexed titles).

## 24. For which years are metrics available?

The first year for which metrics are available is 1999. This is because it takes four years of data to calculate a complete value for SNIP and SJR, and Scopus citation data start in 1996.

At launch in January 2010, metrics were available from 1999 to 2009. The metrics are updated twice a year.

If any data are available for a particular year, metrics will be calculated even if that citation year is not complete.

## 25. When will metric values be refreshed?

We will refresh metric values twice per year. We aim to refresh in April and September, in line with the updates in Scopus' Journal Analyzer.

An early version of any year's metric can be calculated in that year – so in 2010, a 2010 metric can be calculated. At the date of writing, the most recent refresh was November 2010, based on a data cut taken in April 2010. Values up to 2009 are available in Scopus.com, and 2010 values are already available on [www.journalmetrics.com](http://www.journalmetrics.com), under the Journal Metrics Values tab.

For comparison, new Impact Factors are added to Journal Citation Reports in June of each year. The 2010 Impact Factor will be available in June 2011, significantly later than 2010 SNIP and SJR.

## 26. What exactly will be published when you refresh the data?

To answer this question, we first need to consider the effect that a dataset, in this case a specific database, has on the resulting values. SNIP and SJR are calculated from Scopus, which not only adds new content as it comes out, it is also continuously updating historical content. As a consequence, SNIP and SJR values cannot be fixed in time; when the values are published, they will take all the historical updates into account as well.

Scopus adds content retrospectively to fill gaps, include back files of additional publishers, and to add significant new areas of content, such as with the Arts & Humanities project. Scopus is dynamic, and always shows citations per document received up to the current moment.

Transparency in the generation of SNIP and SJR is very important. If we artificially fix SNIP and SJR at a particular point in time, then in the future we might find that what is in the database no longer reflects the fixed metric values. Transparency means being able to relate the metrics to the current state of the database.

Therefore, with each data refresh, all values (current year and backwards) will be recalculated and refreshed. The info site will house an archive of values for verification purposes.

Impact Factors, in comparison, are fixed for all time once published because no data are added retrospectively into their source database. Impact Factors are not calculated from the Web of Science, but from Journal Citation Reports – an internal database only available within Thomson. This also means users cannot access the data to understand why they are seeing certain results.

## 27. How do SJR and SNIP handle journal self-citations?

1. SNIP does not make any distinction between whether a citation comes from the same or from a different journal.
2. SJR counts journal self-citations up to a third of the total received, and then discounts any above this threshold.

This difference in approach is a decision taken by the CWTS and SClmago research groups, and not by Elsevier /Scopus.

We accept that in a few situations journal self-citations represent an excessive proportion of the citations a journal receives. However in the vast majority of cases, journal self-citations are part of the accepted and valued flow of influence between publications, and should be incorporated into metric calculations. Even in cases where a journal has 90% self-citation, it may be valid if the journal is very niche. Blindly discounting these is not in line with our users' needs.

## 28. What is the effect of increasing journal self-citation on increasing SJR and SNIP values?

Increasing the number of journal self-citations is sometimes used as a way to 'game' the Impact Factor. This is quite easy for the Impact Factor because all citations are counted, even those coming from non-peer reviewed content, such as editorials.

SJR and SNIP are calculated only based on peer-reviewed material – this is a key difference from the Impact Factor. They count citations coming only from articles, reviews and conference papers, and only when they are directed towards articles, reviews and conference papers. This makes it much more difficult to intentionally increase SJR and SNIP by trying to increase journal self-citation.

For SJR, journal self-citation is limited to a maximum of 33% of the total references found in a journal. When computing SJR, we count the total number of references in a journal in the analyzed year, and then we count how many of those references are directed to the journal itself and limit this to 33% of total references if needed. This ensures that an 'artificial' increase of journal self-citation stops having any effect when it surpasses standard journal self-citation practices.

The SNIP for a journal is the ratio of the raw impact per paper (in the numerator) and the relative database citation potential in the subject field covered by the journal (in the denominator).

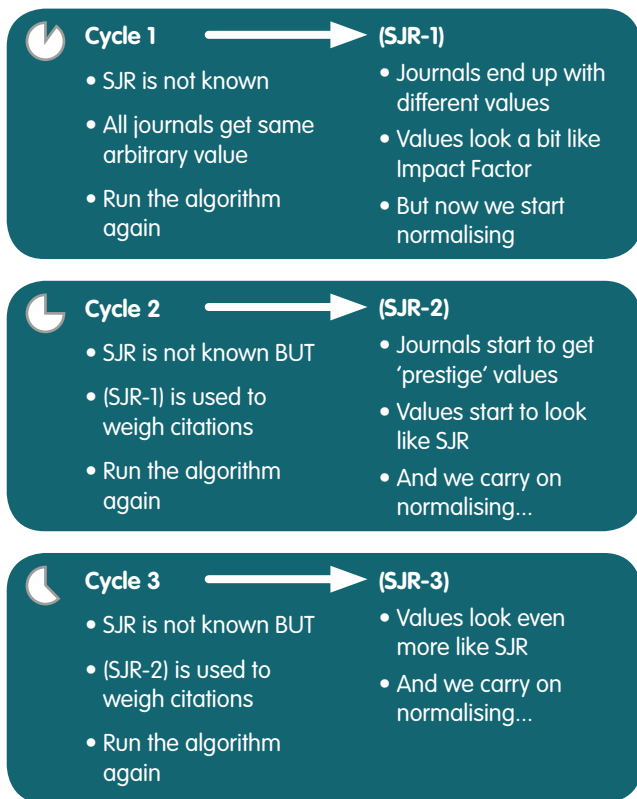
- The effect of increasing journal self-citation on the numerator is about the same as for the Impact Factor.
- The effect on the denominator depends on the citation potential in the journal's papers that are responsible for the increased self-citation.

**Note:** Even though increasing self-citation can have a positive effect on the Impact Factor, this effect is only likely to be short term. In the longer term, authors may find the journal too 'esoteric' and stop submitting papers to it and even stop citing it.

The prestige that a journal transfers when it cites another journal is equal to its SJR for that year, and yet citing is used to generate the SJR. This seems very circular – how does it work?

SJR uses an iterative process to build up a value through successive cycles. This graphic shows the process:

**SJR depends on an iterative calculation i.e. several cycles**



1. **Cycle 1:** the same arbitrary value is assigned to all the sources in the database – you cannot start things off when all sources have a nominal SJR value of 0.
  - a. The value that is given could be anything; it doesn't really matter. SCImago sets this arbitrary value at 0.1, meaning that every source inside Scopus starts with an SJR of 0.1.
  - b. All sources outside Scopus (not indexed) have a value of 0.
  - c. 0.1 therefore represents a minimum prestige that every journal achieves just by being included in the database.
2. In the first cycle of the iterative process, all citations are worth the same because all the journals have the same prestige.
  - a. The first round will just calculate raw impact – average citations per document – something similar to the Impact Factor. But you will start to see differences in the values the journals have after the first cycle.
  - b. You can't stop here because the real aim of SJR has not been applied yet – now we have to start to distinguish the citations depending on the prestige of the journal that they come from. To apply the prestige factor, we need to run more rounds.
3. **Cycle 2:** the average-citations-per-document value calculated in the first round acts as the journal's prestige for the second round.
  - a. In this second round, citations start to have different weights depending on the journal they come from, and this will change the value of the citations they make.
  - b. Values at the end of this round will be different from those at the end of the first round and start to look like SJR
4. We keep cycling until a 'steady state' is reached. This means the iterative process runs until the differences between the prestige values of journals in two consecutive iterations are no longer significant.

# E. How to use the metrics and understand the results?

## 29. Can I view SJR and SNIP by subject classifications?

You can do this, but one of the key advantages of SNIP and SJR is that you don't have to use them in this way.

You can use SJR and SNIP within a journal category, but you can also create your own set of journals (your 'virtual category'). You don't have to worry about different subject fields and behavior because the metrics take care of this for you.

You are probably used to viewing journals within a subject field because metrics that don't 'normalize' the differences in behavior between subject fields, like Impact Factor, are only useful when viewed in this way.

For reference, Scopus currently includes the following three categories:

- The four subject areas shown on the basic search page.
- 27 main categories, within which you can search and view results in Scopus.
- 330+ sub-categories, which are not displayed or searchable in Scopus. These categories are supplied with the Custom Data sent to SCImago and CWTS.

## 30. Why might a journal in Scopus not have a metric for a particular year?

There are a few reasons why this could be possible – take a look at the list below to see if any apply to the journal you are looking at:

1. Newly launched/indexed and in the first year of content in Scopus.
2. Newly launched/indexed and in second year of content in Scopus before the current year's metrics release.
3. Newly launched/indexed and in second year of content in Scopus but after current year metrics release. Journal could be behind schedule, or indexing could have run into problems (e.g. lack of delivery) meaning that there is no current year content in Scopus and so it is not yet possible to calculate metrics.
4. Discontinued – no content in previous three consecutive years.
5. The source is a trade journal – we only calculate metrics for peer-reviewed titles.
6. Inactive titles according to Scopus source browse file – metrics are not calculated for these sources.
7. Journal does not contain peer-reviewed content (articles, reviews or conference papers), although it has other content that is still indexed in Scopus.

## 31. Are SNIP values for individual titles comparable between years? I am not sure because each year is normalized to its own median journal's Citation Potential

SNIP is a ratio of a journal's raw citation impact per paper (RIP) and the citation potential in the journal's subject field. The subfield's database citation potential (DCP) is normalized relative to that of the median journal in the database. In this way, for 50 percent of journals, their relative DCP is above one, and for the other 50 percent it is below one. Correspondingly, compared to the raw impact per paper, 50 percent of journals have a SNIP value above RIP, and another 50 percent below RIP.

It is true that normalization to this 50-50 rule is done each year separately, but this is intentional because the database coverage changes over the years and citation potential in a subject field may change as well. Another factor to bear in mind is the general tendency for the number of cited references per source article to increase ('authors cite more'), especially the number of one- to three-year-old cited references per source article ('authors cite more recent materials'), and this leads to an increase in absolute citation potential. In order to correct for these changes (but also for other reasons, see below), DCP is normalized on a yearly basis because coverage and citation practices change over the years.

Henk Moed: "The normalization applied in the calculation of SNIP makes the DCP estimates more comparable across years, so that SNIP values are just as comparable over time as classic Impact Factor values."

## 32. How can I increase my journal's SJR and SNIP?

Make sure the journal is good and attracts citations. There are no tricks (we have tried hard to think of any but so far have failed) that allow easy manipulation of these metrics, which is one of their major advantages over the Impact Factor. These actions will have a positive effect:

1. Publish good review articles.
2. Secure articles from prominent authors.
3. Publish content from conferences and special issues.
4. Focus on growing fields in which the ratio of citable and citing papers is very high because the field is expanding.
5. For SJR – increase the proportion of papers likely to be cited by prestigious titles.

### 33. Why is this result (value/rank etc) different from the Impact Factor?

There are two aspects that can play a role here: (i) the database from which the metrics are calculated and (ii) the metrics themselves:

- i. Simply using a different database will cause a different result. If you calculated SNIP and SJR using Thomson's database, you would get different values than you do using Scopus. They have different coverage.
- ii. The metrics are calculated differently. SNIP and SJR are designed to evaluate journals based on different aspects of performance than those emphasized by the Impact Factor.

**Think about the following examples for why there could be differences:**

1. Document type classification differences.
2. Database content coverage differences.
3. If your citation count is lower – remember that SJR and SNIP only count citations from articles, reviews and conference papers. Impact Factor counts citations from all document types, including editorials.
4. SJR – citing journals could have low or high prestige.
5. SNIP – normalization process using citation potential – a journal could sit in a field with a high citation potential, which will significantly reduce its raw impact value. Or it could sit in a field with a low citation potential, which will increase its raw impact value.

### 34. With the Impact Factor, you can make a good article have a bit more influence on the value by publishing it in January instead of in December. Is this true for SJR and SNIP?

The advantage of publishing in January and not December is very small for the Impact Factor, but it is one way to get maximum benefit from a highly cited paper. This positive effect is even smaller when using **SJR and SNIP**.

The reason this effect is weaker for SNIP and SJR is because they are calculated based on three-year citation windows while Impact Factor uses a two-year window. This means that (i) for SNIP and SJR, one year accounts for 33% and not 50% of the metric, and (ii) SNIP and SJR are calculated from more papers than the Impact Factor, so the effect of one or a few papers on the journal's average is reduced. In addition, the citation advantage that a January paper has over a December paper declines as the papers age: for three-year-old papers the effect is much lower than for one- or two-year-old papers.

Also remember that SJR and SNIP do not only depend on raw citation counts.

- A journal publishing a very influential item of content will only see a positive effect on its SJR if the extra citations come from prestigious journals – so the item published in January needs to be not only highly cited, but highly cited by prestigious titles.
- For SNIP, the topicality of the journals providing any extra citations can affect the citation potential of the journal's field – citations from very topical journals increase citation potential and decrease SNIP.

### 35. My journal's SNIP value/rank shows a sudden drop. Why?

SNIP and SJR values, as well as other data results in Scopus, are available in a partial form during current years. This has a significant (lowering) effect on SNIP because SNIP depends on total citation inflow to calculate accurate values. A SNIP value calculated partway through a year will not be able to count all the citations for that year. SJR does not suffer the same drops because it is calculated relative to the database for the year – so the fact that the year is partial is corrected for in the calculation.

We believe that the benefits of releasing early, partial, values outweigh the drawbacks. Our customers have indicated that they value preliminary indicators. Scopus Analytics also includes partial-year data for document output and citations, which tend to dip in the current year. This was another reason for feeling quite comfortable about going ahead with partial year numbers.

Ultimately, if you want a value that corrects partway through a current year, use SJR. These metrics are supposed to be complementary.

### 36. There are some discrepancies between previous years' SNIP values published in January 2010 and refreshed later in 2010 that seem rather large. What has happened?

The source of these discrepancies, where they exist, is a methodological difference regarding how to deal with journals that have not received any citations in a particular citing year.

In the methodology used to generate the January 2010 data, journals that received no citations were disregarded because no information was available on their subject fields. The methodology used to calculate values later in 2010 assigned a SNIP value of 0 to these journals.

The SNIP calculation normalizes the citation potential of a journal's sub-field relative to the median of all journals included in the analysis, so that 50% journals end up with a citation potential above the database median, and 50% with a citation potential below the database median. The more recent methodology produces more journals with a SNIP value of zero, which reduces the database median by 20–30%, with implications for the resulting SNIP values.

This modification to the algorithm was made based on advice from CWTS, which calculates the SNIP values. We continue to discuss with both CWTS and SCImago the benefit of future modifications to the algorithms, although the basic philosophies behind SJR and SNIP will not change.

### 37. My journal's SJR value/rank shows a sudden drop. Why?

The SJR value of a specific journal is not only affected by the prestige of the journals citing it, it can also change in relation to the (evolving) coverage of the database.

Professor Felix de Moya explains that in calculating the SJR, a value of 'prestige' is first calculated for every journal in the database. Prestige is size-dependent, and could be mathematically expressed as the probability that if we ask any researcher in the world which journal the paper they are reading is part of, the paper belongs to the selected journal. The probabilistic values for all the journals in the database sum to 1; in other words, the bare fact of being included in Scopus gives a journal some prestige, but Scopus has a fixed amount of prestige so if there is increasing journal coverage over the years the prestige is shared over more journals, and previously included journals will experience a decrease in base SJR value.

**Note:** This decrease will not necessarily affect a journal's rank unless more prestigious journals are included in Scopus.

It is also important to note that the Citations and Documents charts in Journal Analyzer don't refer to the same windows as SJR and SNIP. The citations chart shows citations to all publications up to the respective year. For a journal to maintain or increase its citation rates, the line should go upwards, as it does for Nature and Science in the screenshots below. However, for Cell the line stays flat, indicating that each document is being cited less often because there are more available to be cited.

When using SJR, it is more important to look at the patterns rather than absolute values. SJR is good for assessing the relative ranks between journals.

### 38. When should I use SJR and SNIP, rather than the Impact Factor?

- For journals that do not have Impact Factors.
- When subject field differences may affect ranking, and not only quality.
- When comparing basic and applied journals.
- When investigating multi-disciplinary fields; e.g. in SciVal Spotlight. For more information on SciVal Spotlight visit [www.info.scival.com](http://www.info.scival.com)

### 39. When should I use SJR or SNIP?

The following are guidelines and not hard and fast rules. They are taken from:

'SJR and SNIP: two new journal metrics in Elsevier's Scopus' <http://dx.doi.org/10.1629/23215> This paper is also available free on [www.journalmetrics.com](http://www.journalmetrics.com)

#### Guidelines on when to consider SJR:

- To enhance position of post-prestigious journals (SJR emphasizes the differences).
- If focusing on Life and Health Sciences.
- If you consider topicality to be important in journal performance.
- If you want to weight citations based on the status of the citing journal.

#### Guidelines on when to consider SNIP:

- If value is less important than rank (SNIP reduces the differences).
- If you are focusing on Engineering, Computer Science, and/or Social Sciences.
- If you are focused on subject field normalization.
- If you think that impact and topicality are separate and should be considered independently.

#### 40. Can you export the metrics from the Scopus Journal Analyzer?

No. You can email and print from the Journal Analyzer, but not export. You can export the metrics from [www.journalmetrics.com](http://www.journalmetrics.com). You can register to download the entire dataset (Excel) for free, (version September 2010) or register and get the entire set with a complete 2010 update. Go to [www.journalmetrics.com](http://www.journalmetrics.com) and select journal metrics values

#### 41. In Scopus Analytics, do the documents, citations and % not cited tabs refer to the SJR and SNIP citation windows?

No. An SJR or SNIP value for 2009 is calculated based on content published 2006–2008, and citations received in 2009. The other tabs have the following windows:

##### 1. Document tab

- a. Shows documents published in a single calendar year.
- b. Counts all document types, not only the peer-reviewed types (articles, reviews and conference papers) used to generate SJR and SNIP.

##### 2. Citations tab

- a. Shows all citations received in that year, whichever year the document being cited was published in. No citation window is applied
- b. Shows all citations from all document types and to all document types, not only from and to the peer-reviewed document types (articles, reviews and conference papers) used to generate SJR and SNIP.

##### 3. % not cited

- a. Shows the % documents published in a given calendar year that has not been cited to date.
- b. See points made above for documents and citations tab.

You can use these other tabs to help you understand changes in SJR and SNIP over time, and different rankings between journals within the same year. This will make most sense if you look at trends, rather than absolute values. There are exceptions to all the examples below, but consider the following:

1. If one journal has a lot more citations than another, and about the same number of documents, chances are that its SJR and SNIP values will be higher.
2. If a journal has steady citations, and an increasing number of documents, it is likely that its SJR and SNIP values will be falling because the underlying citations-per-document value is falling.
3. If one journal has a higher proportion of uncited content than another, it will probably have lower SJR and SNIP values.

**Note:** You can also look in the document results to see a particular citation window, and use the citation tracker to see citations received in a particular year.

# F. Further Information

## 42. Are other publishers allowed to display these metrics?

Yes. SJR and SNIP are freely available outside Scopus ([www.journalmetrics.com](http://www.journalmetrics.com)) and we welcome their use on other websites. This is intended as a basis for the free distribution of and open debate on journal metrics.

## 43. Where can I go for more information?

[www.journalmetrics.com](http://www.journalmetrics.com)

Presentations on YouTube:

<http://www.youtube.com/user/ScopusTV>

SJR [www.scimagojr.com](http://www.scimagojr.com)

SNIP [www.journalindicators.com](http://www.journalindicators.com)



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