

# SciVal: Patent metrics



August 2016

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## 1. Executive summary

- Patents protect technical inventions, which are new and can be applied in industry.
- A full technical description of the invention must be disclosed in a patent application.
- All patent information lays in the public domain and is therefore fully available.
- It takes around 18 months for a patent application to be published, which means a time-lag of approximately 18 months before the data is available to be used in SciVal.
- Patent protection can be attained in any country but is normally subject to strategic or business purposes due to costs that patent maintenance incurs.
- Patents, in the same way as scientific publications, also contain references to previous work done within the same field.
- Patents usually cite other related patents or scholarly output (scientific publications).
- SciVal looks at the citations of scholarly output in patents and provides links to both the citing patents and cited Scopus articles. This helps showcase connections between science and industry as well as the knowledge flows.
- SciVal covers patents from 5 of the largest patent offices: EPO (European patent office), USPTO (US patent office), UK IPO (UK intellectual property office), JPO (Japan patent office) and WIPO (World Intellectual Property Organization).
- SciVal's patent-related metrics serve as additional tools to demonstrate research impact.

## 2. Patent basics

### Highlights

- *Patents protect technical inventions from commercial exploitation by 3<sup>rd</sup> parties for a limited time-frame and in the countries where the patent protection has been attained.*
- *In order to be patentable, inventions must be novel, inventive and industrially applicable.*
- *Full technical description of an invention, disclosed in the application, will be publically available worldwide and not limited to the countries where the patent protection will be attained.*
- *Patents often cite research papers along with other patents.*

### 2.1. What is a patent?

A patent is an exclusive right granted for an invention, which is a new technical solution to a problem. Technical information about the invention must be disclosed to the public in a patent application.<sup>1</sup> Patent protection gives its owner the right to prevent 3<sup>rd</sup> parties from exploiting the patented invention for commercial purposes within 20 years from the date of application.

Being publically available, patent information is therefore an important source of technical knowledge, as well as an essential element of statistical analysis to observe innovation, technology trends and R&D activities at regional, country, institution and individual levels.

### 2.2. What can be patented?

Inventions need to meet the following requirements:

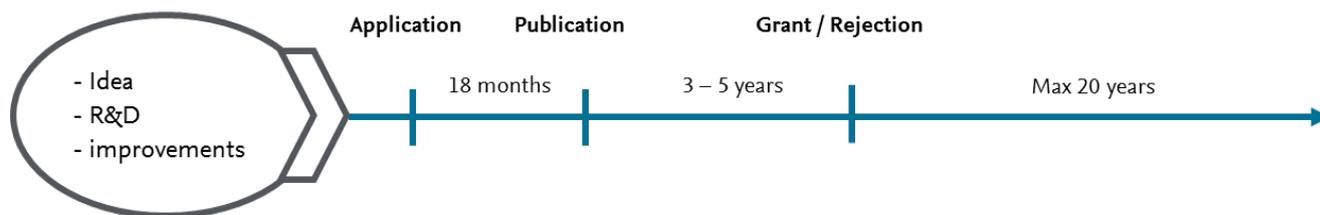
- Novelty – it should not form part of existing state of the art, and should not have been published before the application.
- Inventiveness – it should not be obvious to a skilled person within the state of the art.
- Industrial application – the research should lend itself to industrial application.

### 2.3. Patent Lifecycle

All patent information is publically available and can be found in patent databases. However, it takes around 18 months for a patent application to be published after the initial application date. Therefore there is a time-lag in the availability of patent information – everything we see today is at least 18 months old. It takes a further 3 to 5 years for a patent application to be granted or rejected by a patent office.

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<sup>1</sup> <http://www.wipo.int/patents/en/>



## 2.4. Where can I file for patent protection?

Patent protection can be attained in any and all countries worldwide. A researcher can submit patents in multiple countries, however, due to incurring filing and maintenance costs, research institutions normally restrict their country selection to core strategic countries and markets. Decisions about whether to grant a patent is taken by the individual patent offices, and guidelines may differ from country to country.

*More information:*

European Patent Office guidelines

[http://documents.epo.org/projects/babylon/eponet.nsf/0/E6CE616AFBB87AFAC125773B004B93B5/\\$File/european\\_patents\\_and\\_the\\_grant\\_procedure\\_2015\\_en.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/E6CE616AFBB87AFAC125773B004B93B5/$File/european_patents_and_the_grant_procedure_2015_en.pdf)

UK Government Intellectual Property Office – Protecting your patent abroad

<https://www.gov.uk/government/publications/protecting-your-uk-intellectual-property-abroad/protecting-your-patent-abroad>

## 3. Analysis of patent data

### Highlights

- Patent documents contain information about inventors, owners, countries where the invention is protected, technical field of invention and references to both patent literature and scholarly outputs.
- Patent data is publically available and is used for statistical analysis to measure innovation, technology trends, and R&D activities, among others.
- Patent citations to scholarly output indicate a connection between research and industry, with original research as an input into innovation.

### 3.1. What kind of information do patents contain?

Each patent contains a technical description of an invention, applicant (owner) details, inventor names and references to both patent literature and scholarly output (research papers). Additionally, each patent is classified according to patent subject classification systems.

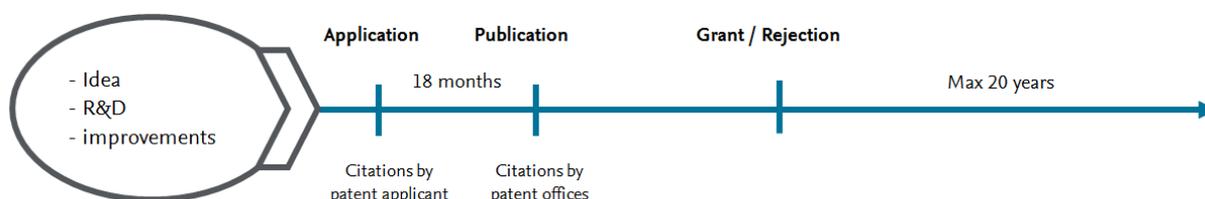
Historically academia collaborates far more with itself than with industry, so patents and their citations provide a relevant collaboration indicator between industry and basic research.

### 3.2. What are patent citations?

Patents, as well as research literature, contain references to previous work that gives background information about an invention. These citations may be to other patents, or to original research publications. The way patent citations differ from citations in research papers is that patent citations are provided not only by the applicant ("author") but also by the patent examiners who are reviewing the applications in the various country patent offices.

There is a difference from citations in the research world is that patent citations are provided not only by the applicant but also by the examiners who are reviewing the application in the various country patent offices.

#### Majority of patent citations



More information: Organisation for Economic Co-operation and Development OECD

<http://www.oecd-ilibrary.org/docserver/download/9209021e.pdf?expires=1453458755&id=id&accname=guest&checksum=A4F1D546F24A557DE53D70476CCAA9F2>

## 4. SciVal's socio-economic metrics

### Highlights

- SciVal looks at citations from patents to scholarly output.
- Citation of scholarly output in patents indicates a connection between academia and industry.
- SciVal's patent-related metrics serve as a tool to help detect and demonstrate research impact.
- SciVal looks at the citations of scholarly output in patents and links to both the citing patents and cited articles.

#### 4.1. How does SciVal use patent citations?

SciVal identifies and counts citations which research papers have received from patents. From the perspective of a research publication, these would be “forward citations” indicating whether the research results have subsequently been used in the patent world. It is important to remember that patents are published and can only become available for use in research metrics around 18 months after the application date.

#### 4.2. What is the coverage of patent data in SciVal?

We look at five of the largest patent offices: [EPO](#) (European Patent Office), [USPTO](#) (US Patent Office), [UK IPO](#) (UK Intellectual Property Office), [JPO](#) (Japan Patent Office) and [WIPO](#) (World Intellectual Property Organization).

#### 4.3. Why should I look at citations in patents?

Citations from patents to scholarly outputs indicate a link between academia and industry, in other words knowledge flows. It is not possible from patents to see whether the results of the research are eventually commercially exploited, but research cited by patents is a strong indicator of the relevance that research could have to industry.

#### 4.4. What do SciVal patent-related metrics mean?

Along with other indicators available in SciVal, patent-related metrics are intended to be used alongside qualitative input to showcase research impact.

- **Citing-Patent Count** – This is the count of patents citing the scholarly output published by the entity (e.g. a university) that you are looking at.  
i.e. **200 patents** have cited articles published by Athena University over the past 5 years.

**The count of patents may be higher than the number of scholarly outputs cited, since multiple patents could refer to the same piece of output.** The count of outputs may be higher than the number of patents since one patent can refer to multiple scholarly outputs.

Click “View list of patents” so see a list of the citing patents. Drill down to the patent abstract and underlying data for additional insights into this metric.

- **Patent-Cited Scholarly Output** – This is the count of scholarly output published by the entity (e.g. a university) that have been cited in patents.  
i.e. **400 publications from Athena University** have been cited by patents.

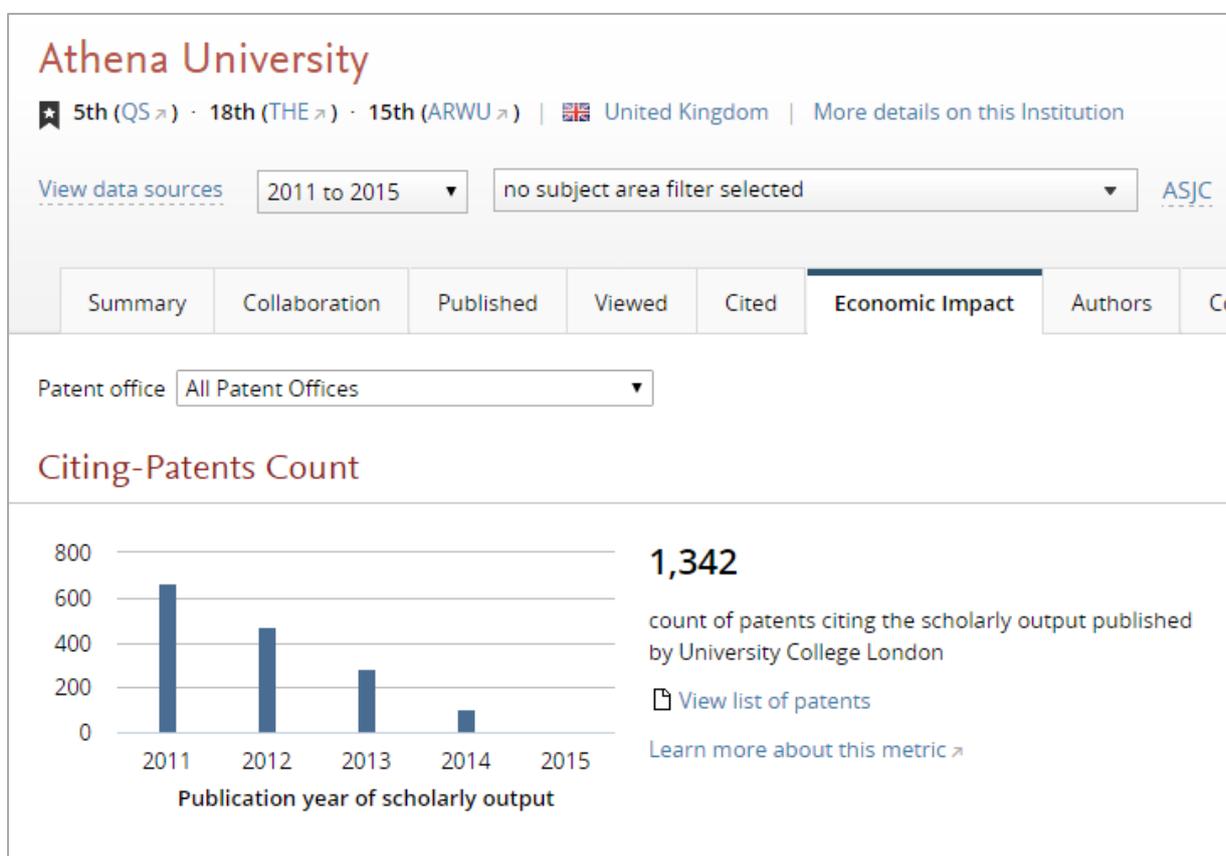
Click “View list of publications” to see a list of the cited scholarly output in Scopus. Drill down to the article abstract and underlying data for additional insights into this metric.

- **Patent-Citations Count** – This is the total count of patent citations received by the entity (e.g. a university).

i.e. **Athena University has been cited 600 times** by patents over the past 5 years. From our example this means that the 400 publications from Athena University’s 400 publications have been cited 600 times by the 200 patents.

- Patent-Citations per Scholarly Output** – This is the average patent-citations received per 1,000 scholarly outputs published by the entity (e.g. a university).  
 i.e. divide the patent-citation counts by the total scholarly output of the university for that period of time and multiply by 1,000. So if Athena University had published 10,000 publications in the 5 year period, their patent-citations per scholarly output would be  $(600/10,000) \times 1,000 = 60$ . We look at this metric per 1,000 publications because otherwise the typical average patent citations per output is a small number and harder to interpret.

For all of the charts, the year on the x-axis relates to the year of the scholarly output that the patents have cited, not the year that the patents were published.



Example analysis taken from the Overview module in SciVal

## 5. Further reading & Links

OECD Patents Statistics Manual  
<http://www.oecd->

[ilibrary.org/docserver/download/9209021e.pdf?expires=1453458755&id=id&accname=guest&checksum=A4F1D546F24A557DE53D70476CCAA9F2](http://ilibrary.org/docserver/download/9209021e.pdf?expires=1453458755&id=id&accname=guest&checksum=A4F1D546F24A557DE53D70476CCAA9F2)

Publishing v. Patenting, IPR Helpdesk, European Commission's Executive Agency for Competitiveness and Innovation

[http://www.iprhelpdesk.eu/sites/default/files/newsdocuments/Patenting\\_v.\\_publishing\\_0.pdf](http://www.iprhelpdesk.eu/sites/default/files/newsdocuments/Patenting_v._publishing_0.pdf)

WIPO (World Intellectual Property Organization) report on patent application trends worldwide

[http://www.wipo.int/export/sites/www/ipstats/en/wipi/2015/pdf/wipi\\_2015\\_patents.pdf](http://www.wipo.int/export/sites/www/ipstats/en/wipi/2015/pdf/wipi_2015_patents.pdf)

How to apply for a European patent

<https://www.epo.org/applying/basics.html>

IPR Helpdesk – free of charge advice regarding intellectual property provided to EU funded research projects and EU SMEs

<http://www.iprhelpdesk.eu/>