

# Letter to the Editor

## Concerns About the Consequences of Patenting on Scientometric Research

Dear Sir,

Our concerns about the practice of patenting scientometric techniques began with an electronic notification alerting one of us to a patent titled “Scientometric Methods for Identifying Emerging Technologies” (Abercrombie, Schlicher, & Sheldon, 2015).<sup>1,2</sup> This came to our attention after we had already embarked on a research program to apply scientometric methods for the identification of emerging technologies here at the JRC. We were at a loss how to respond. This seemed to run counter to the spirit of openness and public science that has characterized the bibliometric community from the start. We got in contact with former colleagues Ben Martin and Daniele Rotolo, authors of a bibliometric study entitled “What is an emerging technology?” (together with Diana Hicks, published in *Research Policy*, 2015). Even though we were experts and professionals in innovation studies (although not all specifically on IP), we were not entirely sure of the patent’s wider implications. Could it threaten to shut down our research? Could it rule out any research funding or consultancy opportunities? What ensued was a series of fruitful exchanges between us authors, with some of us not sure how to interpret this patent, and others disappointed (even outraged) that the patent had been granted on grounds of “non-obviousness.” Opinions were divided whether a patent like this could have any impact at all. It took us a long time to grasp the (possible) implications of this patent, but other researchers in other circumstances might not have been as fortunate.

Amid the uncertainty, the issue has a lot of relevance. Patents can block basic research (Andrews et al., 2006)—see, for instance, the case of plant science (Yancey & Stewart, 2007). Even *thinking* about a patented technique while using an alternative one may constitute a case for infringement of patent rights (Andrews et al., 2006). This seems to us particularly problematic when the patented technique has dubious novelty, nonobviousness, or disclosure.<sup>3</sup> Moreover, we live in an increasingly globalized economy, where Trade Agreements put increasing importance on IP and patents, and reinforce the scope for private companies to sue other companies, universities, or even governments—see for instance WTO’s TRIPS agreement, or the secretive Trans-Pacific Partnership.

Meanwhile, governments often take patents as indicators of economic development, and introduce policies to increase the number of patents as well as to strengthen the economic rights afforded by these patents.<sup>4</sup> This is occurring while patent offices are granting increasing numbers of patents, allowing “bad” patents to be granted, while maintaining a stance of “rational ignorance” (Lemley, 2001). We should be more (not less) careful now about what is patented and the way patent systems work. These are times of growing discontent with respect to the latter (see *inter alia* Boldrin & Levine, 2013), whereas popular opinion (and relatedly, the Open Access movement) considers that scientific output should be freely available.<sup>5</sup>

Coming back to our case, scientometrics has recently enjoyed a rapid growth and there is considerable interest regarding the analysis of Emerging Technologies, not only from the academic community, but also from policy makers and international organizations. Some of us authors learned that patenting in scientometrics and bibliometrics actually has a longer history (for earlier patents see Boyack, Grafe, Johnson, & Wylie, 2002; Goodman et al., 2004; Kostoff, 2005; Kostoff, Miles, & Eberhart, 1995).<sup>6</sup>

We feel there is a need for greater clarity concerning what is patentable and what is not—and that this clarity will prevent the rise of patenting of scientometric methods. For example, the requirement of nonobviousness to “one skilled in the art” should be applied more rigorously, and broad-scope patents based on commonly used methods should not be patentable. Actually, some of the patents cited here (and many IT business methods ones) are essentially represented by an algorithm consisting of a series of basic necessary steps for the evaluation of a specific quantity. Generally, Andrews et al. (2006) describe the broad claims of one improbable US Patent (Shetty, 2005): “One patent claims the use of a computer to derive a solution to any optimization algorithm. . . . Commentators expressed the opinion that no one would ever attempt to patent such an obvious and important method of problem-solving . . . The patent holder can, until the patent expires in 2021, demand a royalty from any industrial engineer, facilities planner, telecommunications analyst, or other researcher who uses this algorithm with computer assistance.”

Patenting in scientometrics and bibliometrics is often done because individuals (e.g., working in US government laboratories) have incentives to demonstrate to their superiors that they are at the forefront of technical

expertise, and use patents as a “currency.” Assurance is given that these patents will not be enforced (Greenwood, 2012),<sup>7</sup> and some have even recommended that patenting of science should accelerate: “precluding certain genes from patentability would be shortsighted in that it would create prohibitions that might well be regretted in the future” (Goldstein & Golod, 2002). Scholars are often told to assume that the patent-holder will not go to court for a litigation. However, we are unimpressed with claims that these patents will not be enforced. It is as if a gun is being pointed in the face of scientometric research, while being assured that no-one wants to squeeze the trigger (yet?). Instead of putting too much confidence in comforting assurances, we would rather remove the gun. What next—could a hard-pressed patent holder threaten academic researchers with an out-of-court settlement, and close down their research programmes? Many researchers might abandon their field of academic research to avoid a long litigation process, even if they are convinced that the law is on their side, and a fortiori if they are unsure of the technicalities of the law.

There are several cases in which scientometric patents might be problematic, for example, if academics work at for-profit private universities (Yancey & Stewart, 2007, p. 1227): “For private universities, the answer is made clear by *Madey v. Duke*. They can be sued for making, using, selling or importing patented technologies, even if they have no intention of commercializing the fruits of the research.” If academics or universities apply for research funding or engage in consulting based on their research competences to finance their activities, this might lead to (more) problems in the future.

To conclude, scientometric methods are being patented, and this has actually occurred for a few decades. It seems that scientometric researchers can probably ignore these patents—for now—and continue unimpeded with their research. However, there is uncertainty regarding the implications of these patents in future. We are therefore apprehensive about the patenting of scientometric methods, and would prefer that (e.g., for reasons of obviousness) that these patents were not granted.

## Supporters

Prof. Daniele ARCHIBUGI (Italian National Research Council, CNR, Institute of Regional Studies; University of London, Birkbeck College), Prof. Loet LEYDESDORFF (University of Amsterdam, Amsterdam School of Communication Research ASCoR), Prof. Ben MARTIN (SPRU - Science Policy Research Unit, University of Sussex), Dr Daniele ROTOLO (SPRU - Science Policy Research Unit; University of Sussex and Georgia Institute of Technology), Dr Andrea FILIPPETTI (National Research Council of Italy, CNR, Institute of Regional Studies; Visiting Fellow at the Department of Geography and Environment, London School of Economics and Political Science).

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## Endnotes

<sup>1</sup>Subsequent searches showed that this is the first patent registered at the USPTO containing the word “scientometric” in the abstract.

<sup>2</sup>Interestingly, the patent is very similar to the authors’ previously published article (Abercrombie, Udoeyop, & Schlicher, 2012). This raises separate issues of whether patents can or should accompany journal articles on scientometric methods, and whether such patents would essentially correspond to disclosing the same information twice.

<sup>3</sup>For information about what can be patented, and the requirements for novelty and nonobviousness see e.g., <http://www.uspto.gov/patents-getting-started/general-information-concerning-patents>

<sup>4</sup>However, the effectiveness of these policies has been put in question (e.g., Alstadsæter, Barrios, Nicodeme, Skonieczna, & Vezzani, 2015 on patent boxes).

<sup>5</sup>However, these are also times witnessing recent “patent wars,” which have a potential impact on competition and on customers as well (e.g., *Apple vs Samsung*). As noticed by Filippetti (2012), these “wars” send a message to other (possible) competitors—“the game [...] will be extremely tough”—and the high legal cost entailed are charged on the consumer by the winners.

<sup>6</sup>Another example is a patent taken out by Xerox on the cocitation method (Pitkow, Pirolli, Mackinlay, & Card, 2000) based on a procedure described initially in a paper published in the early 1970s (Small & Griffith, 1974). However, the patent was specific to the use of cocitation analysis in a particular device and display system, called hereafter an “embodiment,” which is also described in the patent. Including an embodiment in a software patent allows inventors to patent their technique/algorithm for use in that specific embodiment (according to the USPTO), however, the embodiment is often unclear. This is also true for patents on bibliometric techniques.

<sup>7</sup>See however the doubts expressed by the *Nature Methods* editor at the end of Greenwood (2012).

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**Antonio Vezzani,  
Alex Coad, and  
Petros Gkotsis**

*European Commission, Joint Research Centre,  
Institute for Prospective Technological Studies,  
Calle Inca Garcilaso 3, Seville 41092,  
Spain*

*E-mail: antonio.vezzani@ec.europa.eu;  
alexander.coad@ec.europa.eu; petros.gkotsis@ec.europa.eu*

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