The curse of the impact factor

Last year our journal received the financial support of the Slovenian National Research Agency (ARRS). An important parameter in determining the level of support is the journal's impact factor for the previous year. Luckily, our official impact factor for the year 2012 was 0.67, which for the first time put AMC into the second quartile among mathematical journals covered by the ISI. The flow of manuscripts reaching our editorial office has increased significantly, and the acceptance rate of papers submitted to the AMC has dropped from over 75% in the initial years, to under 20% currently.

The careers of many young and emerging mathematicians around the world now depend on the bibliometric parameters of the journals in which their papers appear. In some cases, publishing in high impact factor journals brings substantial rewards to the authors. They climb more quickly and higher up the academic scale, they can obtain tenure earlier, their access to grants is secured, and the institutions they work for are financially rewarded.

Also in many jurisdictions, the large volume of applications and competition for money between different research fields has resulted in a modification of selection and ranking procedures, using bibliometric data in order to give a greater impression of objectivity. Unfortunately, in a large number of cases this reduces to a single parameter, which is the journal impact factor.

For these reasons we were anxious to see the release of the 2013 impact factor, which is announced in the Journal Citation Report. We were quite disappointed when we found out that the citation figures issued in the JCR did not appear to match the figures in the ISI database. The ISI database shows 27 citations in the year 2013 for AMC articles published in the years 2011 and 2012, but the JCR shows only 22. When we asked about the difference, we were advised that 5 citations (about 20% of the total) came in too late to be used. Apparently the JCR is taken as a snapshot in time, but does not give the true figure, as it omits citations made in publications in the given year but after the snapshot is taken. We noticed several problems with such a policy. The time when the snapshot is taken is not announced in advance. However it is certainly taken several months before the release of the JCR. Nevertheless it makes it impossible for an independent observer to check the correctness of figures published in the JCR. In our case the doubts of impartiality and objectivity of the published impact factors remain.

Let n denote the number of citations in the JCR and let N be the corresponding number of citations in the database. Define $\lambda = (N-n)/n$ to be the *JCR citation loss* of a journal. For ACM for the year 2013 the citation loss was $\lambda = 5/22 = 0.227$. We computed λ for several comparable journals from a well-known commercial publisher. And they were much lower. This questions the validity and reliability of the JCR and the impact factor itself, in an era when so many decisions have become so dependent on it.

Of course there are other well known (and well-documented) flaws in the use of citations and impact factors, stemming from the fact that they are not solely a measure of impact, but are influenced by so many other things such as citation culture in the discipline or sub-discipline, numbers of authors per paper, trends (and 'hot' topics), and even mistakes made and corrected. It seems that there is stronger correlation between impact and power than impact and quality.

We are trying to convince our sponsors that the impact factor should not be given too much weight in any formula or process for deciding on the amount of financial support for scientific publications. Our greater worry is that misuse of a flawed impact indicator managed by a profit-oriented private company may have unjustified impact on the evaluation of scientific quality in publicly funded research. We believe that learned societies should have greater role in this process. In mathematics, AMS with MathSciNet and EMS with Zentralblatt are more than adequate authorities to measure impact of research in mathematics. Unfortunately we are not aware of any learned society that would be able to offer comparable services for the science community at large.

Dragan Marušič and Tomaž Pisanski

Editors In Chief