We analyze the benefits in terms of scientific impact deriving from international collaboration, examining both those for a country when it collaborates and also those for the other countries when they are collaborating with the former. The data show the more countries there are involved in the collaboration, the greater the gain in impact. Contrary to what we expected, the scientific impact of a country does not significantly influence the benefit it derives from collaboration, but does seem to positively influence the benefit obtained by the other countries collaborating with it. Although there was a weak correlation between these two classes of benefit, the countries with the highest impact were clear outliers from this correlation, tending to provide proportionally more benefit to their collaborating countries than they themselves obtained. Two surprising findings were the null benefit resulting from collaboration with Iran, and the small benefit resulting from collaboration with the United States despite its high impact.

Introduction

It is accepted by the scientific community that scientific collaboration leads to increased impact of the results that are generated at least on the country level, and recently the high-impact institutions have been significantly more collaborative than others (Gazni, Sugimoto, & Didegah, 2012). Scientific collaboration depends on the discipline (Cronin, Shaw, & La Barre, 2003), as may the benefits. In particular, the effect of collaboration on scientific impact appears to be more positive in the “hard” sciences, such as physics and astronomy, than in the “soft” sciences, such as sociology or social sciences (Bandyopadhyay, 2001; Marshakova-Shaikevich, 2006; Moed, Bruin, Nederhof & Tijssen, 1991; Stack, 2002), with citation behavior sometimes differing considerably from one field to another (Lancho-Barrantes, Guerrero-Bote, & Moya-Anegon, 2010a, 2010b).

The benefits will also depend on the different types of collaboration (Katz & Hicks, 1997; Leimu & Koricheva, 2005): (a) domestic in-house collaboration (all authors from the same institution); (b) domestic institutional collaboration (all authors from the same country but from more than one institution); and (c) international collaboration (authors from more than one country; Leimu & Koricheva, 2005). Although institutional collaboration is more important than domestic in-house collaboration, international collaboration is even more so in the sense that it increases the citation rates far above those of domestic national collaboration (Katz & Hicks, 1997; Sooryamoorthy, 2009).

Gómez, Fernandez, and Sebastian (1999) consider that international collaboration increases the impact of research papers because they are published in journals of greater impact than those of national collaborations. Narin and Whitlow (1990) find evidence that papers with multiple international coauthors have double the citation frequency of those without such collaboration. Schmoch and Schubert (2008) suggest that international papers are more highly cited because their potential community is larger. In other