

Preface

In 1976, Francis Narin, founder and for many years president of the information company CHI Research, published a seminal report to the US National Science Foundation entitled *Evaluative Bibliometrics: The use of publication and citation analysis in the evaluation of scientific activity*. The current book represents a continuation of his work. It is also an update of an earlier book published by the current author in 2005, *Citation Analysis in Research Evaluation*. In the past 15 years, many new developments have taken place in the field of quantitative research assessment, and the current book aims to describe these, and to reflect upon the way forward.

Research assessment has become more and more important in research policy, management and funding, and also more complex. The role of quantitative information has grown substantially, and research performance is more and more conceived as a *multi-dimensional* concept. Currently not only the classical indicators based on publication and citation counts are used, but also new generations of indicators are being explored, denoted with terms such as altmetrics, webometrics, and usage-based metrics, and derived from multiple multi-disciplinary citation indexes, electronic full text databases, information systems' user log files, social media platforms and other sources. These sources are manifestations of the computerization of the research process and the digitization of scientific-scholarly communication. This is why the current book uses the term *informetrics* rather than *bibliometrics* to indicate its subject.

Informetrics and quantitative science, technology, and innovation (STI) studies have enforced their position as an academic discipline, so that STI indicator development is determined at least partially by an internal dynamics, although external factors play an important role as well, not in the least the business interests of large information companies. As its title indicates, the current book deals with the *application* of informetric tools. It dedicates a major part of its attention to how indicators are used in practice and to the benefits and problems related to this use. It also discusses the relationships between the informetric domain and the research policy and management sphere, and launches proposals for new approaches in research assessment and for the development of new informetric tools.

Following Francis Narin's publication from 1976, the term *evaluative* in the book's title reflects its focus on *research assessment*. But this term refers to the *application domain* and delineates the *context* in which informetric tools are being used. It does *not* mean that informetrics is *by itself* evaluative. On the contrary, this book defends the position that informetricians should maintain *in their informetric work* a *neutral* position towards evaluative criteria or political values.

Target Audience

This book presents an introduction to the field of applied evaluative informetrics. It sketches the field's history, recent achievements, and its potential and limits. It also discusses the way forward. It is written for interested scholars from all domains of science and scholarship, and especially for the following categories of readers.

- All those subjected to research assessment;
- Research students at advanced master and Ph.D. levels;
- Research managers and science policy officials;
- Research funders;
- Practitioners and students in informetrics and research assessment.

Structure

The book consists of six parts as follows:

- **Part I** presents an *introduction* to the use of informetric indicators in research assessment. It provides an historical background of the field and presents the book's basic assumptions, main topics, structure, and terminology. In addition, it includes a *synopsis*, summarizing the book's main conclusions; readers who are interested in the main topics and conclusions of this book but who do not have the time to read it all could focus on this part.
- **Part II** presents an overview of the various types of *informetric indicators* for the measurement of *research performance*. It highlights the multi-dimensional nature of research performance and presents a list of 28 often used indicators, summarizing their potential and limits. It also clarifies common misunderstandings in the interpretation of some often used statistics.
- **Part III** discusses the *application context* of quantitative research assessment. It describes research assessment as an evaluation science and distinguishes various assessment models. It is in this part of the book that the domain of informetrics and the policy sphere are disentangled analytically. It illustrates how external, non-informetric factors influence indicator development and how the policy context impacts the setup of an assessment process.

- **Part IV** presents *the way forward*. It expresses the current author's views on a series of problems in the use of informetric indicators in research assessment. Next, it presents a list of new features that could be implemented in an assessment process. It highlights the potential of informetric techniques and illustrates that *current* practices in the use of informetric indicators could be *changed*. It sketches a perspective on *altmetrics* and proposes new lines in longer term, strategic indicator research.
- **Part V** presents five *lectures* with *historical overviews* of the field of bibliometrics and informetrics, starting from three of the field's founding fathers: Derek de Solla Price, Eugene Garfield, and Francis Narin. It presents 135 slides and is based on a doctoral course presented by the author at the Sapienza University of Rome in 2015, and on lectures presented at the European Summer School of Scientometrics (ESSS) during 2010–2016, and in the CWTS Graduate Courses during 2006–2009.
- Finally, **Part VI** presents two full articles published recently by the current author in collaboration with his co-authors on hot topics of general interest in which the use of informetric indicators plays a key role. These topics are a critical comparison of five *world university rankings* and a comparison of *usage* indicators based on the number of *full text downloads* with *citation*-based measures.

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