

Bibliometrics And Research Evaluation Uses And Abuses History And Foundations Of Information Science

Evaluation of scientific research, particularly of research which is supported by government funds, is a matter of growing concern in virtually every nation. It is no longer adequate to expect that the value of investments in research will be judged in long-term historical perspective. Resources are scarce and policy-makers are looking for ways to assure that these resources are used in the most effective way. From the life-or-death evaluations of academic research institutes in the post-communist countries to the Government Performance and Results Act(GPRA) in the United States, research evaluation has become a topic of utmost importance in science policy. Evaluation often has substantial consequences for researchers and research institutions, including restructuring, shifting of priorities, budget reductions, or even closures. Therefore it is essential that evaluation is done systematically and objectively, with methodologies that can be understood and trusted by those concerned. This book is based on a NATO Advanced Research Workshop, co-organized by the Academy of Sciences of the Czech Republic and the American Association for the Advancement of Science. It describes a range of the most up-to-date methods of science evaluation and the experience with their implementation in many countries. This book can be of interest to researchers, policy-makers, practitioners of science evaluation and many others interested in science policy.

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Why bibliometrics is useful for understanding the global dynamics of science but generate perverse effects when applied inappropriately in research evaluation and university rankings. The research evaluation market is booming. “Ranking,” “metrics,” “h-index,” and “impact factors” are reigning buzzwords. Government and research administrators want to evaluate everything—teachers, professors, training programs, universities—using quantitative indicators. Among the tools used to measure “research excellence,” bibliometrics—aggregate data on publications and citations—has become dominant. Bibliometrics is hailed as an “objective” measure of research quality, a quantitative measure more useful than “subjective” and intuitive evaluation methods such as peer review that have been used since scientific papers were first published in the seventeenth century. In this book, Yves Gingras offers a spirited argument against an unquestioning reliance on bibliometrics as an indicator of research quality. Gingras shows that bibliometric rankings have no real scientific validity, rarely measuring what they pretend to. Although the study of publication and citation patterns, at the proper scales, can yield insights on the global dynamics of science over time, ill-defined quantitative indicators often generate perverse and unintended effects on the direction of research. Moreover, abuse of bibliometrics occurs when data is manipulated to boost rankings. Gingras looks at the politics of evaluation and argues that using numbers can be a way to control scientists and diminish their autonomy in the evaluation process. Proposing precise criteria for establishing the validity of indicators at a given scale of analysis, Gingras questions why universities are so eager to let invalid indicators influence their research strategy.

Academic libraries have traditionally had two key functions, to support teaching and to support research. In an evolving and

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competitive university environment, along with the emergence of various technologies and substantial changes in scientific communication, university management has reached a turning point. Academic libraries are facing a paradigm shift in the role they need to play to achieve the research objectives of universities. Research support services in academic libraries have evolved as a response to these changes. They are heterogeneous, adapt to their university culture, adopt different points of view, take different approaches in their organizational structures, and include a diverse catalog of activities. Having an overview of different experiences will allow libraries to adopt best practices, redefine services, and even establish new management and collaboration models. *Cases on Research Support Services in Academic Libraries* is a critical scholarly resource that uses case studies to systematize the experiences of research support services in academic libraries for the support of higher education faculty. The cases focus on such items as the role of technology and its impact as well as how these services help to improve the excellence of universities. Featuring a wide range of topics such as library services, data management, and open science, this book is ideal for librarians, academicians, professionals, researchers, and students.

Tina Besley has edited this collection which examines and critiques the ways that different countries, particularly Commonwealth and European states, assess the quality of educational research in publicly funded higher education institutions. Such assessment often ranks universities, departments and even individual academics, and plays an important role in determining the allocation of funding to support university research.

This volume offers a comprehensive view of current research directions in Translation and Interpreting Studies, outlining the theoretical concepts underpinning that research and

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presenting detailed discussions of the various methods used. Organized around three factors that are responsible for shaping the study of translation and interpreting today—post-positivist theoretical approaches, developments in the language industry, and technological innovations—this volume is divided into three parts: Part I introduces the basic concepts organizing translation and interpreting research, such as the difference between qualitative and quantitative research, between product-oriented and process-oriented studies, and between prescriptive and descriptive approaches. Part II provides a theoretical mapping of current translation and interpreting research, covering the theories underlying the current conceptualization of translation and interpreting, from queer studies to cognitive science. Part III explores the key methodological approaches to research in Translation and Interpreting Studies, including corpus-based, longitudinal, observational, and ethnographic studies, as well as survey and focus group-based studies. The international range of contributors are all leading research experts who use the methodologies in their work. They present the research aims of these methods, offer sample research questions that can—and cannot—be addressed by these methods, and discuss modes of data collection and analysis. This is an essential reference for all advanced undergraduates, postgraduates, and researchers in Translation and Interpreting Studies.

The goal of any research assessment is to evaluate the value or quality of the research in comparison to other research. As quality is highly subjective and difficult to measure, citations are used as a proxy. Citations are an important part of scholarly communication and a significant component of research evaluation, with the assumption being that highly cited work has influenced the work of many other researchers and hence it is more valuable. Recently we have seen new

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online data sources being researched for this purpose and disruptive ideas with the power to change research assessment, and perhaps even science as a whole, have been born. Altmetrics is the new research area that investigates the potential of these new data source as indicators of the impact that research has made on the scientific community and beyond, and thus possibly also as indicators of the societal impact of research. This book will present some of these new data sources, findings from earlier altmetrics research, and the disruptive ideas that may radically change scholarly communication. Presents some of the key ideas and innovations in earlier research that have been driving the evolution from bibliometrics to webometrics, and with the advent of social media to altmetrics Discusses the shortcomings and pitfalls of bibliometrics in research evaluation and the potential of altmetrics to overcome some of these shortcomings Presents some of the most important data sources of altmetrics, the aggregators, and the different stakeholders Reviews current research about altmetrics and discusses possible future trends Presents a way to measure and aggregate altmetrics according to the level of impact or type of impact they represent

This book analyses and discusses the recent developments for assessing research quality in the humanities and related fields in the social sciences. Research assessments in the humanities are highly controversial and the evaluation of humanities research is delicate. While citation-based research performance indicators are widely used in the natural and life sciences, quantitative measures for research performance meet strong opposition in the humanities. This volume combines the presentation of state-of-the-art projects on research assessments in the humanities by humanities scholars themselves with a description of the evaluation of humanities research in practice presented by research

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funders. Bibliometric issues concerning humanities research complete the exhaustive analysis of humanities research assessment. The selection of authors is well-balanced between humanities scholars, research funders, and researchers on higher education. Hence, the edited volume succeeds in painting a comprehensive picture of research evaluation in the humanities. This book is valuable to university and science policy makers, university administrators, research evaluators, bibliometricians as well as humanities scholars who seek expert knowledge in research evaluation in the humanities.

Bibliometrics and Research Evaluation Uses and Abuses MIT Press

We intend to edit a Festschrift for Henk Moed combining a “best of” collection of his papers and new contributions (original research papers) by authors having worked and collaborated with him. The outcome of this original combination aims to provide an overview of the advancement of the field in the intersection of bibliometrics, informetrics, science studies and research assessment.

This volume gathers selected peer-reviewed papers presented at the international conference "MAF 2016 – Mathematical and Statistical Methods for Actuarial Sciences and Finance", held in Paris (France) at the Université Paris-Dauphine from March 30 to April 1, 2016. The contributions highlight new ideas on mathematical and statistical methods in actuarial sciences and finance. The cooperation between mathematicians and statisticians working in

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insurance and finance is a very fruitful field, one that yields unique theoretical models and practical applications, as well as new insights in the discussion of problems of national and international interest. This volume is addressed to academicians, researchers, Ph.D. students and professionals.

This report - linked to the technical documents of the OECD manuals for the measurement of R & D activities ("Frascati Family") - presents the essential elements of bibliometrics and its application to the analysis of research systems. Bibliometrics is based on the enumeration and statistical analysis of scientific output in the form of articles, publications, citations, patents and other, more complex indicators. It is an important tool in evaluating research activities, laboratories and scientists, as well as the scientific specialisations and performance of countries. The report, having set the background for the development of bibliometrics, presents the databases on which bibliometrics is built, as well as the principal indicators used. Twenty-five examples are presented at the end of the document, illustrating the various uses of bibliometric methods for analysing research systems. These indicators measure scientific output, by counting the number of papers; the impact of ...

This book presents an introduction to the field of applied evaluative informetrics, dealing with the use of bibliometric or informetric indicators in research

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assessment. It sketches the field's history, recent achievements, and its potential and limits. The book dedicates special attention to the application context of quantitative research assessment. It describes research assessment as an evaluation science, and distinguishes various assessment models, in which 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. It also clarifies common misunderstandings in the interpretation of some often used statistics. Addressing the way forward, the book expresses the author's critical views on a series of fundamental problems in the current use of research performance indicators in research assessment. Highlighting the potential of informetric techniques, a series of new features is proposed that could be implemented in future assessment processes. It sketches a perspective on altmetrics and proposes new lines in longer term, strategic indicator research. It is written for interested scholars from all domains of science and scholarship, and especially for all those subjected to research assessment, research students at advanced master and PhD level, research managers, funders and science policy officials, and to practitioners and students in the field.

Summary in Dutch.

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This book is written for members of the scholarly research community, and for persons involved in research evaluation and research policy. More specifically, it is directed towards the following four main groups of readers: – All scientists and scholars who have been or will be subjected to a quantitative assessment of research performance using citation analysis. – Research policy makers and managers who wish to become conversant with the basic features of citation analysis, and about its potentialities and limitations. – Members of peer review committees and other evaluators, who consider the use of citation analysis as a tool in their assessments. – Practitioners and students in the field of quantitative science and technology studies, informetrics, and library and information science. Citation analysis involves the construction and application of a series of indicators of the ‘impact’, ‘influence’ or ‘quality’ of scholarly work, derived from citation data, i.e. data on references cited in footnotes or bibliographies of scholarly research publications. Such indicators are applied both in the study of scholarly communication and in the assessment of research performance. The term ‘scholarly’ comprises all domains of science and scholarship, including not only those fields that are normally denoted as science – the natural and life sciences, mathematical and technical sciences – but also social sciences and humanities.

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?This book contributes to the current discussion in society, politics and higher education on innovation capacity and the financial and non-financial incentives for researchers. The expert contributions in the book deal with implementation of incentive systems at higher education institutions in order to foster innovation. On the other hand, the book also discusses the extent to which governance structures from economy can be transferred to universities and how scientific performance can be measured and evaluated. This book is essential for decision-makers in knowledge-intensive organizations and higher-educational institutions dealing with the topic of performance management.

This handbook presents the state of the art of quantitative methods and models to understand and assess the science and technology system. Focusing on various aspects of the development and application of indicators derived from data on scholarly publications, patents and electronic communications, the individual chapters, written by leading experts, discuss theoretical and methodological issues, illustrate applications, highlight their policy context and relevance, and point to future research directions. A substantial portion of the book is dedicated to detailed descriptions and analyses of data sources, presenting both traditional and advanced approaches. It addresses the main bibliographic

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metrics and indexes, such as the journal impact factor and the h-index, as well as altmetric and webometric indicators and science mapping techniques on different levels of aggregation and in the context of their value for the assessment of research performance as well as their impact on research policy and society. It also presents and critically discusses various national research evaluation systems. Complementing the sections reflecting on the science system, the technology section includes multiple chapters that explain different aspects of patent statistics, patent classification and database search methods to retrieve patent-related information. In addition, it examines the relevance of trademarks and standards as additional technological indicators. The Springer Handbook of Science and Technology Indicators is an invaluable resource for practitioners, scientists and policy makers wanting a systematic and thorough analysis of the potential and limitations of the various approaches to assess research and research performance.

A comprehensive, state-of-the-art examination of the changing ways we measure scholarly performance and research impact. Bibliometrics has moved well beyond the mere tracking of bibliographic citations. The web enables new ways to measure scholarly productivity and impact, making available tools and data that can reveal patterns of intellectual activity

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and impact that were previously invisible: mentions, acknowledgments, endorsements, downloads, recommendations, blog posts, tweets. This book describes recent theoretical and practical advances in metrics-based research, examining a variety of alternative metrics—or “altmetrics”—while also considering the ethical and cultural consequences of relying on metrics to assess the quality of scholarship. Once the domain of information scientists and mathematicians, bibliometrics is now a fast-growing, multidisciplinary field that ranges from webometrics to scientometrics to influmetrics. The contributors to *Beyond Bibliometrics* discuss the changing environment of scholarly publishing, the effects of open access and Web 2.0 on genres of discourse, novel analytic methods, and the emergence of next-generation metrics in a performance-conscious age. Contributors Mayur Amin, Judit Bar-Ilan, Johann Bauer, Lutz Bornmann, Benjamin F. Bowman, Kevin W. Boyack, Blaise Cronin, Ronald Day, Nicola De Bellis, Jonathan Furner, Yves Gingras, Stefanie Haustein, Edwin Henneken, Peter A. Hook, Judith Kamalski, Richard Klavans, Kayvan Kousha, Michael Kurtz, Mark Largent, Julia Lane, Vincent Larivière, Loet Leydesdorff, Werner Marx, Katherine W. McCain, Margit Palzenberger, Andrew Plume, Jason Priem, Rebecca Rosen, Hermann Schier, Hadas Shema, Cassidy R. Sugimoto, Mike Thelwall, Daril Vilhena,

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Jevin West, Paul Wouters

A critical issue in research and development (R&D) management is the structure and use of evaluative efforts for R&D programs. The book introduces the different methods that may be used in R&D evaluation and then illustrates these methods by describing actual evaluation in practice using those methods. The book is divided into two sections. The first section provides an introduction and details on several popular methodologies used in the evaluation of research and development activities. The second half of the book focuses on evaluation in practice and is comprised of several chapters offering the perspectives of individuals in different types of organizations. The book concludes with an annotated bibliography of selected R&D evaluation literature, focusing on post-1985 literature, on research evaluation.

Science and Technology Policy theme is a component of Encyclopedia of Technology, Information, and Systems Management Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. Science and technology policy covers all the public sector measures designed for the creation, funding, support, and mobilization of scientific and technological resources. The content of the Theme on Science and technology policy provides the essential aspects

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and a myriad of issues of great relevance to our world such as: Science and Technology Policy; International Dimensions of Science and Technology Policy; The Innovation System; The Policy Making Process in Science and Technology; Regional Perspectives: A New Scenario for Science and Technology Policies in the Developed and Developing World . These two volumes are aimed at the following five major target audiences: University and College students Educators, Professional practitioners, Research personnel and Policy analysts, managers, and decision makers and NGOs This book deals with methods to evaluate scientific productivity. In the book statistical methods, deterministic and stochastic models and numerous indexes are discussed that will help the reader to understand the nonlinear science dynamics and to be able to develop or construct systems for appropriate evaluation of research productivity and management of research groups and organizations. The dynamics of science structures and systems is complex, and the evaluation of research productivity requires a combination of qualitative and quantitative methods and measures. The book has three parts. The first part is devoted to mathematical models describing the importance of science for economic growth and systems for the evaluation of research organizations of different size. The second part contains descriptions and discussions of numerous

indexes for the evaluation of the productivity of researchers and groups of researchers of different size (up to the comparison of research productivities of research communities of nations). Part three contains discussions of non-Gaussian laws connected to scientific productivity and presents various deterministic and stochastic models of science dynamics and research productivity. The book shows that many famous fat tail distributions as well as many deterministic and stochastic models and processes, which are well known from physics, theory of extreme events or population dynamics, occur also in the description of dynamics of scientific systems and in the description of the characteristics of research productivity. This is not a surprise as scientific systems are nonlinear, open and dissipative.

Bibliometrics in Social Work examines the cross-disciplinary field of bibliometrics, including the multiple techniques and applications that have been described in the scholarly literature. Moving beyond this general overview, the authors examine applications of bibliometrics in social work.

Subsequent chapters detail how the technique can be used to demonstrate the eventual impact on the field of publications in selected journals. These analyses are conducted using the bibliometric technique referred to as citation analysis. The authors then move on to present what will be a

controversial proposal to some in the field: using bibliometrics techniques in making academic personnel decisions. The authors propose that hiring, retention, tenure and promotion decisions could be made more uniform and fair by using citation analysis. A series of experts in bibliometric analyses then critically respond to these initial chapters. The authors conclude by weaving their responses to these commentators with new scholarship on bibliometrics that has recently appeared. This unique book is a valuable aid for social work scholars. Drawing on broad interdisciplinary streams of scholarship from around the world, the collection illuminates a field that is not well known to social workers. While cautiously advocating for a number of applications of the technique, the authors balance this position by presenting a comprehensive summary of the criticisms of the technique and by the inclusion of a series of critical commentaries by the leading experts on these issues in the field of social work. *Bibliometrics in Social Work* both summarizes what we know and pushes the field to think about how social work professionals can use this approach to improve our scholarship and the evaluation of scholars. *Bibliometrics in Social Work* addresses: theoretical and methodological issues pros and cons from the view of numerous bibliometric scholars bibliometrics outside of social work

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applications within social work previously reported in the literature estimates that have been reported in the literature of how much social workers publish and how much impact those publications have had how citation analysis can be used to analyzed a selection of publications in a single journal and their subsequent impact how citation analysis might be used to improve academic employment decisions concerns regarding self-citation and multiple authorship measurement issues in bibliometrics (e.g., age adjustments; concentration citedness, and uncitedness; the Price Index; lag times; persistence; synchronous and diachronous self-citations; the Multiple Author Qualifier) Bibliometrics in Social Work critically examines these methods and their applications in social work. The book will be an enlightening read for social work scholars and those academic administrators involved in the evaluation of social work scholars, as well as academic librarians that support social work programs.

This handbook offers a state-of-the-art overview of quantitative science and technology research. It focuses on the development and application of indicators derived from data on scientific or scholarly publications and patents. It comprises 34 chapters written by leading specialists in the various sub-domains. These chapters deal with theoretical and methodological issues, illustrate applications, and highlight their policy context and relevance. Authors present a survey of the research

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topics they address, and show their most recent achievements. The 34 chapters are arranged into 5 parts: Disciplinary Approaches; General Methodology; The Science System; The Technology System; and The Science–Technology Interface. The Editor’s Introduction provides a further specification of the handbook’s scope and of the main topics addressed in its chapters. This handbook aims at four distinct groups of readers: – practitioners in the field of science and technology studies; – research students in this field; – scientists, scholars and technicians who are interested in a systematic, thorough analysis of their activities; – policy makers and administrators who wish to be informed about the potentialities and limitations of the various approaches and about their results.

An Introduction to Bibliometrics: New Development and Trends provides a comprehensible, readable and easy to read introduction to bibliometrics. Importantly, the book surveys the latest developments of bibliometrics (such as altmetrics, etc.) and how the field is likely to change over the next decade. In the literature, bibliometrics is generally discussed from one of two perspectives: (1) Purely mathematical/statistical or (2) Its sociological implications. Both approaches are very far from how most users want to apply bibliometrics. This book fills that need by providing tactics on how bibliometrics can be applied to their sphere of scientific activity. Provides readers with an understanding of bibliometric indicators, including their background and significance, classification in quantitative performance, and an evaluation of science and research Includes an overview

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of the most important indicators, their areas of application, and where and when they should and should not be used Discusses future trends in the quantitative performance evaluation of scientific research

????:Social stratifition in science

This book examines very important issues in research evaluation in the Social Sciences and Humanities. It is based on recent experiences carried out in Italy (2011-2015) in the fields of research assessment, peer review, journal classification, and construction of indicators, and presents a systematic review of theoretical issues influencing the evaluation of Social Sciences and Humanities. Several chapters analyse original data made available through research assessment exercises. Other chapters are the result of dedicated and independent research carried out in 2014-2015 aimed at addressing some of the debated and open issues, for example in the evaluation of books, the use of Library Catalog Analysis or Google Scholar, the definition of research quality criteria on internationalization, as well as opening the way to innovative indicators. The book is therefore a timely and important contribution to the international debate.

?This book provides the reader with the most up-to-date knowledge of blockchain in mainstream areas of security, trust, and privacy in the decentralized domain, which is timely and essential (this is due to the fact that the distributed and P2P applications is increasing day-by-day, and the attackers adopt new mechanisms to threaten the security and privacy of the users in those environments). This book also provides the technical

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information regarding blockchain-oriented software, applications, and tools required for the researcher and developer experts in both computing and software engineering to provide solutions and automated systems against current security, trust and privacy issues in the cyberspace. Cybersecurity, trust and privacy (CTP) are pressing needs for governments, businesses, and individuals, receiving the utmost priority for enforcement and improvement in almost any societies around the globe. Rapid advances, on the other hand, are being made in emerging blockchain technology with broadly diverse applications that promise to better meet business and individual needs. Blockchain as a promising infrastructural technology seems to have the potential to be leveraged in different aspects of cybersecurity promoting decentralized cyberinfrastructure. Blockchain characteristics such as decentralization, verifiability and immutability may revolve current cybersecurity mechanisms for ensuring the authenticity, reliability, and integrity of data. Almost any article on the blockchain points out that the cybersecurity (and its derivatives) could be revitalized if it is supported by blockchain technology. Yet, little is known about factors related to decisions to adopt this technology, and how it can systemically be put into use to remedy current CTP's issues in the digital world. Topics of interest for this book include but not limited to: Blockchain-based authentication, authorization and accounting mechanisms Applications of blockchain technologies in digital forensic and threat hunting Blockchain-based threat intelligence and threat analytics techniques Formal

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specification of smart contracts Automated tools for outsmarting smart contracts Security and privacy aspects of blockchain technologies Vulnerabilities of smart contracts Blockchain for securing cyber infrastructure and internet of things networks Blockchain-based cybersecurity education systems This book provides information for security and privacy experts in all the areas of blockchain, cryptocurrency, cybersecurity, forensics, smart contracts, computer systems, computer networks, software engineering, applied artificial intelligence for computer security experts, big data analysts, and decentralized systems. Researchers, scientists and advanced level students working in computer systems, computer networks, artificial intelligence, big data will find this book useful as well.

In recent years, academic advancement and access to funds that stimulate scientific research have been conditioned by the scientific production of individual scientists as well as the production of scientific centers, institutes and universities. This has led to an increase in interest in the accelerated assessment and ranking of scientists and scientific institutions. Scientometry is a sub-discipline of information sciences that measures achievement in science. This book provides the reader with a detailed insight into relevant scientometric methods and criteria, their individual strengths and weaknesses in the process of ranking scientists, scientific centers and institutions, as well as their application to the process of planning scientific projects and isolated medical specialties.

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This research method case describes the use of bibliometric analysis for the purpose of evaluating a large, federal research program that supported basic research in Science, Technology, Engineering, and Mathematics education. Program evaluation is critical for providing rigorous evidence about program effectiveness and demonstrating that public resources are well spent. This study focused on evaluating the programs impact on knowledge building and on the productivity of individual researchers who received program funding. Our evaluation of impact at the collective and individual levels relied on specific comparison groups and different analytic techniques, which highlight the different uses of bibliometric data. In this study, both analyses revealed that the program attracted highly productive investigators who became even more productive as a result of receiving federal support. This research method case provides an account of how to collect, process, review, and analyze bibliometric data, including data on the number, rate, and impact of journal publications. We discuss the advantages, challenges, and limitations of our approach. The bibliometric analysis used in this particular study is applicable to the evaluation of other national, local, or institutional research programs. Policy makers, academic administrators, scholars, and members of the public are clamoring for indicators of the value and reach of research. The question of how to quantify the impact and importance of research and scholarly output, from the publication of books and journal articles to the indexing of citations and tweets, is a critical one in predicting innovation, and in deciding what sorts of research is supported and whom is hired to carry it out. There is a wide

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set of data and tools available for measuring research, but they are often used in crude ways, and each have their own limitations and internal logics. Measuring Research: What Everyone Needs to Know will provide, for the first time, an accessible account of the methods used to gather and analyze data on research output and impact. Following a brief history of scholarly communication and its measurement -- from traditional peer review to crowdsourced review on the social web -- the book will look at the classification of knowledge and academic disciplines, the differences between citations and references, the role of peer review, national research evaluation exercises, the tools used to measure research, the many different types of measurement indicators, and how to measure interdisciplinarity. The book also addresses emerging issues within scholarly communication, including whether or not measurement promotes a "publish or perish" culture, fraud in research, or "citation cartels." It will also look at the stakeholders behind these analytical tools, the adverse effects of these quantifications, and the future of research measurement. At last, the first systematic guide to the growing jungle of citation indices and other bibliometric indicators. Written with the aim of providing a complete and unbiased overview of all available statistical measures for scientific productivity, the core of this reference is an alphabetical dictionary of indices and other algorithms used to evaluate the importance and impact of researchers and their institutions. In 150 major articles, the authors describe all indices in strictly mathematical terms without passing judgement on their relative merit. From widely used measures, such as the journal impact factor or the h-index, to highly specialized indices, all indicators currently in use in the sciences and humanities are described, and their application explained. The introductory section and the appendix contain a wealth of

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valuable supporting information on data sources, tools and techniques for bibliometric and scientometric analysis - for individual researchers as well as their funders and publishers. Bibliometrics focusses on the quantitative analyses of scholarly publication data. The method mostly means the application of output and impact indicators for research evaluation purposes. The increasing importance of bibliometrics for research evaluation can be observed since the mid-1980s - at least in the natural and life sciences. This overview of the literature on bibliometric indicators discusses methods for measuring output and impact in science. The main focus of the entry is on field-normalized citation impact indicators, which are in use for cross-time and cross-field comparisons of researchers, institutions, and countries. Besides field-normalized indicators, citation-based journal indicators (especially the well-known journal impact factor) and the h-index are addressed. The entry is of interest for many scientists and science policy analysts because research evaluation is prevalent in science and bibliometrics is at the core of research evaluation. It is additionally interesting for social sciences' scientists because many methods used in bibliometrics are from social sciences' disciplines.

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