

CGE Models for Resource-Based Economy: A Comprehensive Bibliometric Analysis

Introduction. This study presents a comprehensive bibliometric analysis that demonstrates the relevance and effectiveness of computable general equilibrium (CGE) modeling in solving economic and policy problems in various macrosystems, especially resource-based economies. The main purpose of the bibliometric analysis is to identify key geographic (authors affiliation, analyzed country, international collaboration) and thematic trends in the CGE-modeling literature. We also describe the main areas of application of CGE-models, give an economic interpretation of bibliometric observations, and briefly review the relevant literature on resource-based economies. The work consists of three sections: the first one presents the technique of bibliometric analysis; the second section describes the main results of the bibliometric databases study; the third section provides a brief literature review of relevant studies that use the CGE-approach to analyze shocks in different export-oriented resource economies. In conclusion, we formulated the key results.

Methodology. The bibliometric analysis technique is based on the experience of previously published systematic reviews of CGE modeling and includes the analysis of publication activity, citations, keywords, and also involves the identification of the most popular scientific sources and the most productive authors. In addition, we analyzed the geography of the CGE-approach and identified the most popular areas of research. We used a large data set containing information on 3657 publications from 1995 to 2021. Fig. 1 shows the research framework of this study and its key stages. We also present an economic and event interpretation of bibliometric observations and a brief literature review of publications on resource economics.

Main results. According to the results of the analysis, we can conclude that CGE-modeling is a popular economic and mathematical tool, which is confirmed by the high quartile of journals that publish studies based on this class of models: more than 69.2% of articles are included in the subset of Q1, Q2 quartiles. The relevance of CGE models is confirmed by a noticeable annual increase in publication activity and total citation, which is largely stimulated by the popularity of environmental and climate issues (40.5% of the total number of studies are related to environmental topics). The greatest contribution to the total value of published publications was made by researchers from the European Union, the USA and China. These countries are also leaders in international cooperation. Most of the CGE models were built to study the Chinese (14.8%), European (8.1%) and American (6.9%) economies. At the same time, the global distribution structure of publications allows us to conclude that the CGE approach is suitable for macrosystems of various types, including developing ones (model framework allows to detail the production sectors and take into account the market characteristics of each country). Based on the obtained results, it should be noted that authors from developed countries are interested in developing

economies, in particular, we are talking about macrosystems that can be described as "export-oriented and resource-oriented".

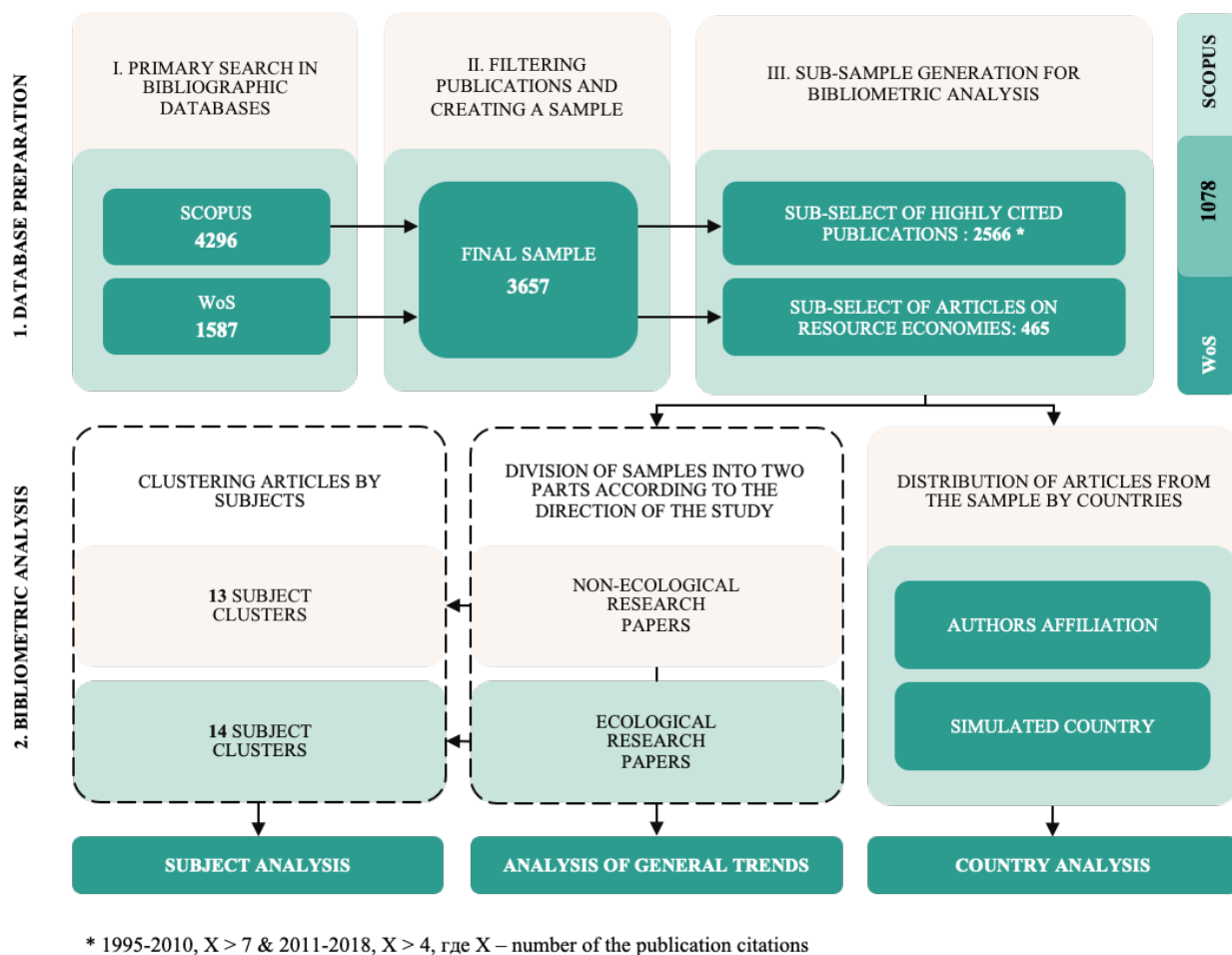


Fig. 1. Methodology and main stages of bibliometric analysis

Poverty, international trade, and trade policy have a key place among non-environmental studies based on the CGE-approach. These trends persist both in the full sample and among articles analyzing resource macro systems. In the environmental articles, a special place is given to the energy sector (traditional and alternative energy), climate policy instruments (double dividends, emissions taxation, emissions trading, etc.), and health and air pollution issues. Among environmental studies focusing on resource-type economies, the most attention is paid to the control of greenhouse gases by fiscal policy, to the energy industry and to the agricultural sector and land use.

In the course of writing this research paper, we were unable to identify publications that provide systematic reviews on CGE-topics in general, not limiting the focus on specific research areas and topics. Moreover, we were unable to find reviews that emphasize attention to the features of CGE modeling of a resource-dependent macro system. We also developed a toolkit that clearly

demonstrates the interaction between scientists from different countries and the relationship between the team of authors and the country of particular model origin.

Keywords: bibliometric analysis, computable general equilibrium models, resource-based economy.