

# Demand for the ESG agenda in modern scientific publications

*Victor Andreevich Blaginin, Maria Nikolaevna Goncharova, Elizaveta Vitalievna Sokolova \**, and *Viktor Evgenievich Kovalev*

Ural State University of Economics, Yekaterinburg, Russia

**Abstract.** The article analyzes the current state of research in the field of ESG (Environmental, Social, and Governance), namely, the degree of relevance and demand for scientific articles on the ESG agenda among scientists - economists, ecologists, managers and sociologists and the scientific community as a whole. The goals are achieved by assessing the citation and thematic diversity of a field of knowledge, as well as identifying factors that influence the success of publications in this field. The work used methods of scientometric and bibliometric analysis of metadata of 3633 documents from the Crossref platform and 7512 documents from the Google Scholar platform for 2000-2023. The study showed that despite a moderate increase in publication activity, the demand for the ESG field remains insignificant. Multidisciplinary and review studies that systematize the literature rather than add to it and analyze new aspects of ESG are highly cited. The findings highlight the need for innovation and new approaches that can capture the attention of the scientific community and provide new impetus for the development of this important field. The ESG field requires active development and renewal in order to address current issues in the field of sustainability and corporate responsibility effectively.

## 1 Introduction

World authorities, business and society have raised issues of environmental protection and sustainable development for several decades. Today, this global trend is commonly called the ESG agenda, which includes three main principles: environmental, social and governance. The concept is intended to act as an investment tool for business assessment, as well as an element of motivational strategies for companies.

The idea of creating an ESG agenda arose at the beginning of the millennium at the height of the bankruptcies of large American companies. The merged financial institutions proposed ESG factors for making investment decisions.

The environmental factor (E) talks about a company's impact on the environment, including waste management, energy consumption, air emissions and water consumption.

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\*Corresponding author: [sokolova\\_ev@usue.ru](mailto:sokolova_ev@usue.ru)

Social factor (S) - the importance of the company's participation in social life and its attitude towards employees, customers, society and social problems, respect for employee rights, reducing pay inequalities, increasing motivation and ensuring labor protection.

G - corporate governance, which includes company transparency, codes of ethics, control over management, anti-corruption standards and social responsibility.

Integrating the principles of the ESG agenda into their activities can open up new opportunities for companies both to attract new consumers of goods/services and to become more attractive and competitive for investors.

The variety of ratings and metrics, as well as their localization in Western countries, does not make it possible to assess the potential of companies from all over the world objectively. These difficulties, combined with current military-political and economic realities, require a more in-depth scientific and practical analysis. The authors set the task of studying the pool of world publications on this topic and finding out the degree of relevance and demand for scientific articles on the ESG agenda among scientists - economists, ecologists, managers and sociologists.

## 2 Materials and Methods

The main methods of achieving the set goals are scientometric and bibliometric analysis of scientific publications, the metadata of which contains a mention of the ESG agenda. These methods make it possible to study the intellectual structure of a particular field in the available scientific literature, as well as to assess the relevance and relevance of the topic through quantitative indicators [5].

Similar methods have previously been used by specialists to study the ESG agenda. For example, Muhammad Arif Khan analyzed 199 articles obtained from the international scientific database (ISSD) Scopus, which used environmental, social and governance ratings as an indicator of sustainability, resulting in the following: three main thematic areas in the literature under study [6]. Based on an analysis of 755 Web of Science publications, Guochao Wan and co-authors identify among the current issues in the direction: the philosophy of the ESG system, factors influencing ESG, financial results of ESG, the relationship between ESG and corporate social responsibility (CSR), as well as ESG investing [9].

Simona Galletta and co-authors conducted a bibliometric analysis of 271 publications indexed in the Web of Science MNCB for the period 1986–2021 to systematize the stages of thematic development of a field of knowledge [7]. Findings from a study of 589 Scopus IDB documents by Maria Elena De Giuli et al show that ESG has received increasing attention in the literature over time, but researchers are working in silos and there is no single approach or core theme that promotes academic productivity [8].

The above studies allow us to draw important conclusions characterizing the thematic area, however, the research database is artificially limited. The most significant limitation is the choice of Scopus and/or Web of Science as the main source of data. Currently, Web of Science (WoS) and Scopus are the two main bibliographic databases [10], however, using only them can lead to bias in favor of certain sciences [11], languages [13] and (or) countries [14].

In addition, unlike similar works, this study aims to study the maximum available full pool of publications, therefore open data platforms Crossref and Google Scholar were chosen as data sources without restrictions on the publication period.

Among open platforms, Google Scholar has a wider coverage than other databases. A number of experts criticize Google Scholar for the lack of quality control necessary for its use as a bibliometric tool [2]. However, others note a significant statistical positive difference between Google Scholar indices compared to the Scopus and Web of Science

databases generally accepted for bibliometric and scientometric analysis, which allows us to concentrate more on the relevance of the topic [3].

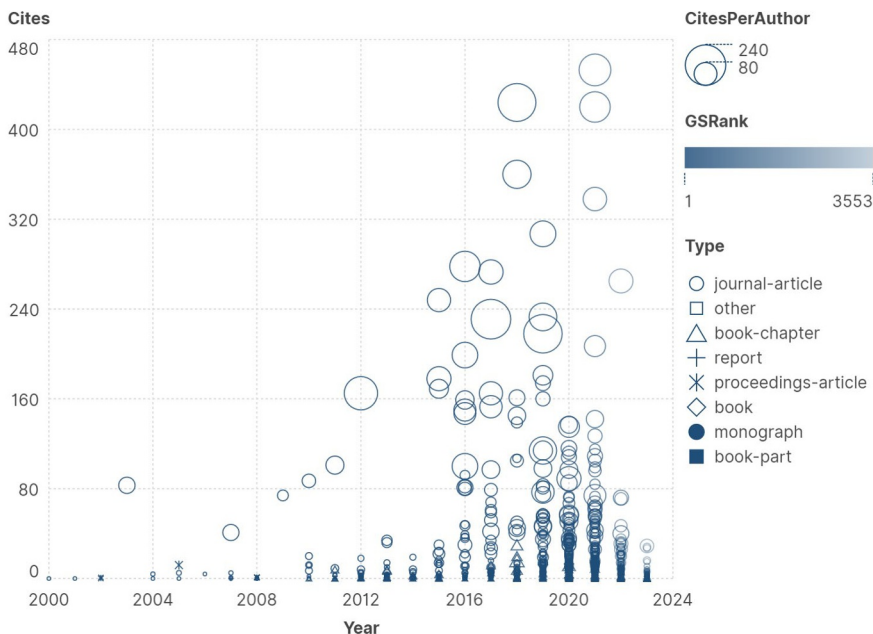
Taking into account the identified gaps in the literature on the topic and taking into account the objectives of this study, the metadata of 3633 documents from the Crossref platform and 7512 documents from the Google Scholar platform for the years 2000-2023 were downloaded, as of 06.01.2023. The capabilities of Publish or Perish, SCImago Graphica and VOSviewer software were used to process the data and create visual elements.

### 3 Results

The team of authors proposes to evaluate the degree of demand for scientific articles on the ESG agenda in several areas: (1) citations, as a sign of the readability of scientific articles and their contribution to the field of knowledge and (2) thematic diversity and turnover, as a sign of the development of the direction.

There is an annual increase in the number of scientific publications on the topic of ESG. There were noticeable surges in publication activity in 2012, 2015, 2017 and 2019, however, after that the volumes remained relatively stable.

The sample of ESG articles studied includes publications of various types, such as books, monographs, conference proceedings, journal articles, and a small number of others. However, the undisputed leaders in terms of citations in this area are journal articles (fig. 1).



**Fig. 1.** Scatter plot of citations of sample publications for 2000-2023 according to the Crossref platform as of 06.01.2023.

GS Rank is the order in which Google Scholar displays query results (1 = first, 2 = second, etc.) [4]. Posts with a lower ranking value are considered to indicate more relevant

query results, i.e. These articles are more relevant to the topic and are assessed by the platform as relevant. On the other hand, areas within one topic are not static and in the process of study are modified, transformed into new ones or introduced into other areas, which leads to the creation of multidisciplinary research. Multidisciplinary research in turn can be understood by the platform as less relevant to the topic than research focused exclusively on Thematic center is the ESG agenda. Therefore, a clear gradation of GS Rank from older to newer publications, presented in Figure 1, firstly, indicates the correctness of the sample, and secondly, can be perceived as indirect confirmation of the thematic transformation of the field.

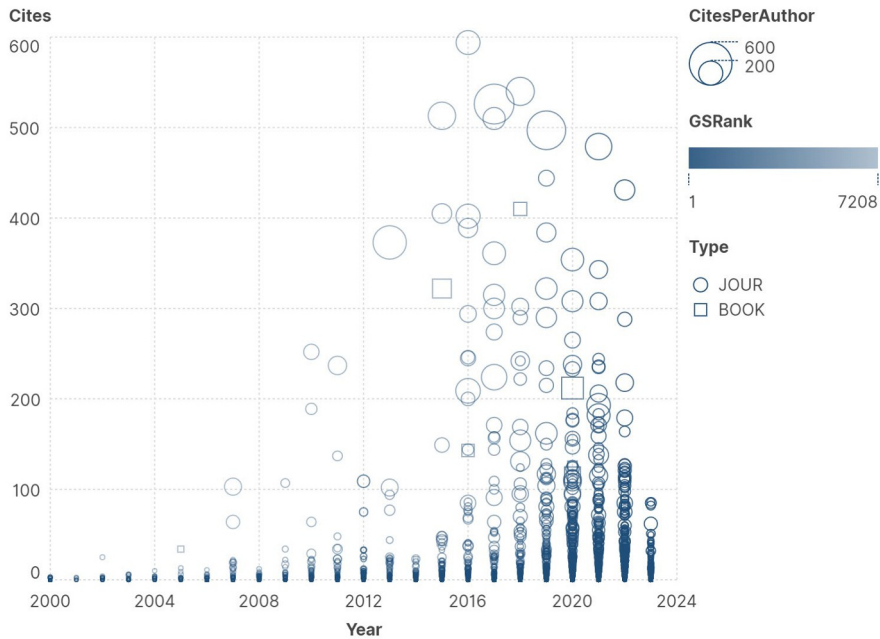
The distribution of citations among the publications in the sample is far from normal, even in works published before 2022, since there are abnormally large values (more than 1000 citations) relative to the average (6.6 citations). For example, the diagram presented in Figure 1 does not display the study by Friede G., Busch T. & Bassen A. “ESG and financial performance: aggregated evidence from more than 2000 empirical studies,” which was cited 1093 times according to Crossref. The publication is distinguished by the fact that it is the most comprehensive review of scientific research on the relationship between environmental, social and governance (ESG) criteria and the financial performance of companies [15].

In the sample, the 25th percentile - 0 citations, the 50th percentile - 1 citations, the 75th percentile - 6 citations, the 95th percentile - 59 citations, the 99th percentile - 193 citations. Thus, most of the works in the sample do not reach even a few citations.

It is assumed that the low number of citations is a feature of the Crossref platform. Since, for example, when registering DOI identifiers, which are the main source of obtaining new metadata into the database, the column “List of sources” is not required to be filled out. According to a study by Angel Borrego et al., Crossref indexes more sources than Scopus and includes additional journals from Eastern and Southern Europe (in the authors' study area), but only half of the journals actually list sources [1].

If citation metrics are measured solely by the global interest of the scientific community in the topic being studied, then Google Scholar is one of the best data platforms available for analysis. According to a study by Alberto Martín-Martín et al., Google Scholar found 88% of all citations, many of which were not found in other sources (Microsoft Academic, Scopus, Dimensions, Web of Science), and almost all citations found in other sources (89–94%) [12].

Due to the peculiarities of the structure of the Google Scholar database, in which the division into types of publications is noticeably simpler than on the Crossref platform, the dominance of journal articles in citations cannot be confirmed; however, the predominance of relatively few book publications is noticeable (Fig. 2). Highly cited books include the work of Hoepner A. G and co-authors on how ESG can benefit shareholders by reducing the risk of a decline in company value [16]; review of scientific literature Matos P. On environmental, social and governance investing (ESG) [17]; book by Bialkowski J. & Starks L. T., in which they provide evidence that flows into ESG funds show greater growth and greater sustainability than flows into conventional funds [18].



**Fig. 2.** Scatter plot of citations of sample publications for 2000-2023 according to the Google Scholar platform as of 06.01.2023.

According to Google Scholar, more papers have citation numbers above the Crossref average, but differences in sample sizes and platform characteristics offset the differences. In general, the conclusion that most of the works in the sample do not reach the value of several citations is observed. Even according to Google Scholar's bullish citation metrics, articles on the ESG agenda are 15% likely to receive 10 citations, 8% likely to receive 25 citations, and 4% likely to receive 50 citations (based on articles published up to and including 2021).

Some information about the structure and composition of the sample is provided by the correlation matrix of numerical indicators, namely:

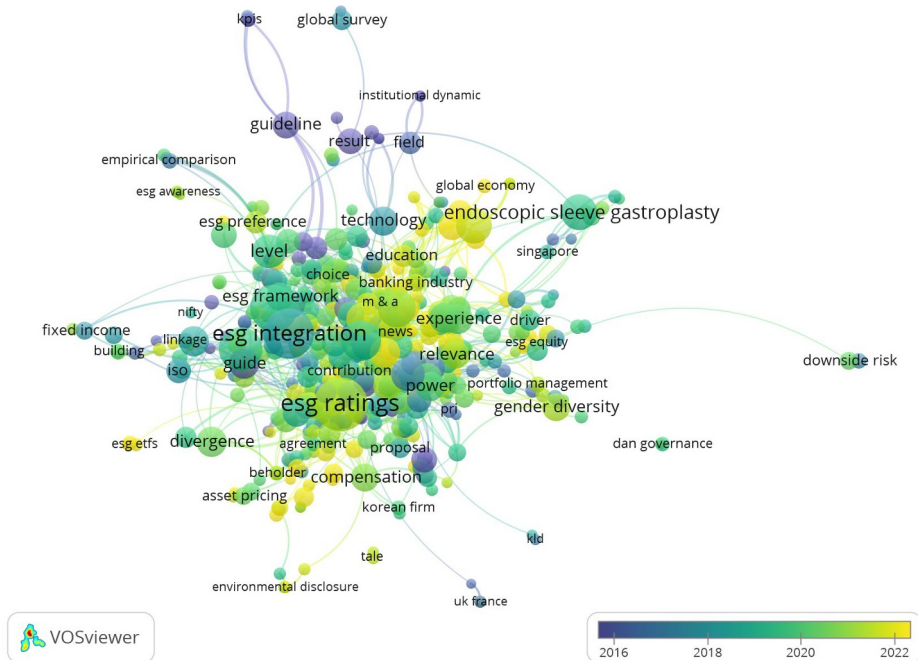
1. Quite a low positive correlation between the age of articles and the number of citations, which may indicate that with the age of an article, the number of citations does not increase significantly. This may indicate that long-lived articles do not always have a large number of citations. It can be assumed that in this area, new and relevant research is in demand than classical, old works;

2. Moderate positive correlation between the number of authors and citations, which may indicate that articles with a large number of authors are cited more often, however, an increase in the number of authors does not guarantee the relevance of the article. It can be assumed that articles written by extended teams of authors may have a broader scientific contribution and therefore attract more citations. However, according to the diagrams presented in Figures 1 and 2, it is clear that most often highly cited articles also have a higher average number of citations per author, and the total number of authors rarely exceeds three;

3. There is almost no linear relationship between the volume of material, expressed in the number of pages, and the number of citations (for works written up to 2021 inclusive).

However, the positive sign of the correlation suggests that, in general, articles with more pages have a greater chance of receiving more citations, but the relationship is not strong.

As emphasized earlier, it is necessary to take into account not only external links to publications, but also the evolution of the thematic area itself. Thus, we can note the presence of new terminology in the metadata of scientific publications, which serves as an indicator of the progressive development of this field (fig. 3).



**Fig. 3.** Terminology network in retrospect according to Crossref and Google Scholar as of 06.01.2023.

ESG research is evolving thematically. If early studies focused mainly on theoretical aspects and demonstrating the importance of ESG initiatives in the future, conducting financial analysis of the potential benefits of implementing an ESG approach, modern studies are more likely to complement this methodology. They discuss the role of technological innovations, such as blockchain and artificial intelligence, in the context of ESG initiatives, and analyze the long-term results and impact they have. New multidisciplinary studies are emerging; however, reviews systematizing the literature regarding innovative materials are beginning to occupy a large share.

## 4 Conclusion

Based on the results of the analysis, it can be concluded that the ESG topic continues to develop, however, there is a limited increase in interest in the form of citations, despite the presence of highly cited publications and a general increase in the body of work. Since the beginning of 2019, there has been stability in the level of publication activity, and this trend is likely to continue. Given the dynamics, there is no reason to assume the emergence of

new sharp bursts of activity, which were observed previously, in the near future without a significant change in topics.

The ESG field is seeing an evolution in thematic focus. With the advent of new terminology in the metadata of scientific publications, one can assert the progressive development of this field. However, at the moment, multidisciplinary and review studies that systematize existing literature are more in demand in the scientific community, rather than introducing new ones.

To summarize, the ESG agenda is currently developing inactively, but is quite in demand. For further development, innovative multidisciplinary research is needed that can attract attention and provide a new breakthrough in its development.

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