

## EUROPEAN FUNDS AND SUSTAINABLE DEVELOPMENT: MAPPING THE RESEARCH LANDSCAPE AND FUTURE DIRECTIONS

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**Abstract:** *In the broader context of European integration and regional convergence, European Structural and Investment Funds have become the main channels through which the European Union achieves balanced territorial development and, progressively, the transition to sustainability. Besides the impressive number of academic papers on these instruments, the structure of this field of research has been rarely mapped systematically. This paper aims to fill this gap by conducting a bibliometric study of the scientific literature based on the publications in the Web of Science Core Collection covering the period 1998-2026. The study finds that the field has experienced a major thematic reshuffle: whereas initially the focus was on the macroeconomic impact and regional convergence, the current scholarly works identify sustainable development as the most pivotal topic in the academic debate, thus signifying the increasing congruence between the EU funding instruments and the European Green Deal as well as the 2030 Agenda. The results also show that governance, management, and quality have become the main themes in the recent research, thereby indicating a move to the institutional and procedural aspects of fund implementation. Geographically, the research highlights a continuing imbalance in scientific output, mainly from beneficiary countries such as Romania and Poland. On the other hand, the academic impact is still concentrated in Western European countries. These outcomes provide a well-structured view of the field and suggest several lines for further research.*

**Keywords:** *European Structural and Investment Funds, sustainable development, bibliometric analysis*

**JEL:** Q01, O52, R11.

### Introduction

The European Structural and Investment Funds represent the largest public policy instrument of the European Union and, at the same time, a privileged object of international academic research, generating a constantly expanding body of literature, heterogeneous in discipline and difficult to synthesize through traditional review methods. While the first waves of studies focused mainly on

assessing the macroeconomic impact of European investments and measuring regional convergence, the recent literature reflects a significant thematic reorientation, determined both by the maturation of the academic field and by the normative pressure of the new multiannual financial framework 2021–2027, which explicitly integrates the objectives of the European Green Deal and the 2030 Agenda into the programmatic logic of the funds. However, a systematic mapping of the way in which this academic production has been structured and evolved of the dominant themes, the intellectual dynamics, and the geographical profile of the contributions remains a relevant gap in the specialized literature, which this study aims to address.

This paper is organised as follows: the literature section situates the study within the broader context of the academic discourse on European structural funds, identifying the gap addressed by the bibliometric approach adopted. The methodology section details the corpus construction procedure, the selection of analytical techniques, including keyword co-occurrence network analysis, thematic mapping, and trend topic identification, and the software tools employed. The results section presents the findings across six dimensions: the frequency and structure of keywords, emerging and declining research trends, the co-occurrence network and its thematic clusters, the thematic map of the field, the temporal evolution of research themes, and the geographic distribution of scientific output and academic impact. Finally, the conclusions summarise the key findings, discuss their implications for the theoretical development of the field, and outline directions for future research.

### **Literature review**

The European Union has gradually increased its emphasis on sustainable development through its policies and especially with the launch of various European Funds (Constantin et al., 2021). This financial framework, and specifically its main component, the European Structural and Investment Funds, is a core vehicle for pursuing territorial cohesion and easing the disparities among member states (Nishimura et al., 2021), disparities that extend beyond income gaps to encompass structural macroeconomic vulnerabilities, as peripheral EU economies are significantly more sensitive to GDP growth contractions than their central European counterparts (Mota et al., 2012).

Besides the broad objectives of promoting innovation, enhancing the competitiveness of SME's, improving infrastructure, and economic growth, the ESIF also plays an important role in shaping the regional development-oriented agenda of the European regions (Di Santo et al., 2023). A considerable number of studies have focused their attention on the effectiveness and impact of these funds towards achieving sustainable development goals (Pricope et al., 2024).

Several bibliometric studies have mapped the evolving research landscape of Sustainable Development Goals and sustainability more broadly, highlighting a substantial annual growth in publications and citations in this domain (Raman et al., 2024; Belmonte-Ureña et al., 2021). This growing academic discourse frequently examines the alignment of EU financial instruments with the Sustainable Development Goals and national sustainable development strategies, employing diverse methodologies to assess their regional impact and effectiveness (Cavalli et al., 2023). While there is a recognized increase in research related to the Sustainable Development Goals since the adoption of the UN 2030 Agenda, systematic comparative evidence on the contributions of EU27 countries to SDG-related knowledge production remains limited (Belényesi & Sasvári, 2025). This paper addresses this gap by mapping the current research landscape concerning European Funds and their role in advancing sustainable development, thereby identifying key themes, methodologies, and areas requiring further investigation.

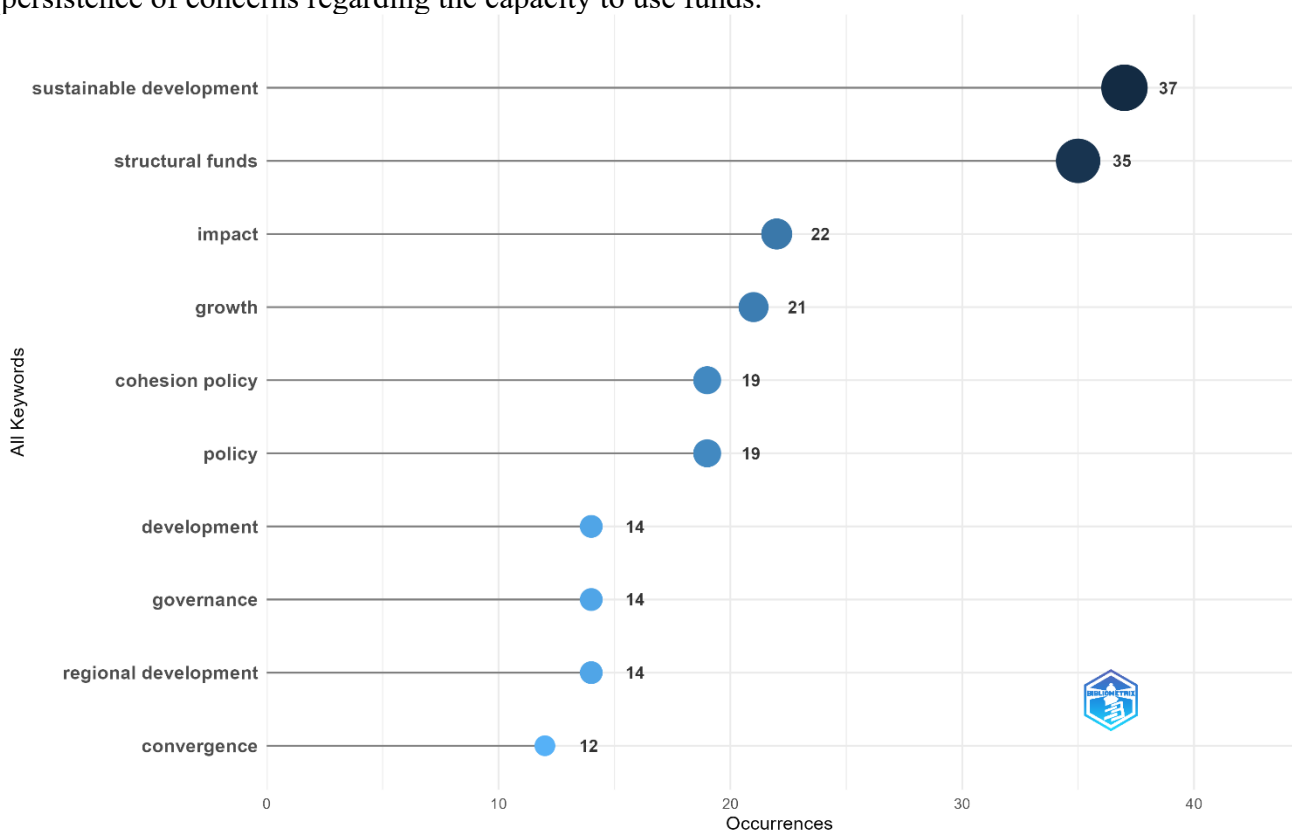
### **Data and methodology**

The necessary data were extracted from the Web of Science - Core Collection database, considered to be one of the most suitable tools for scientometric analyses (Mongeon & Paul-Hus, 2016). The search strategy included two reference terms: "European structural funds" and "sustainable development". The data sample generated 192 documents, which were subsequently limited to those written in English, resulting in 178 scientific papers published in the period 1998–2026.

In order to visualise and analyse bibliometric data, we selected the Bibliometrix package, developed in the R environment (Aria & Cuccurullo, 2017), as the main investigation tool. It provides a robust methodological framework for building and interpreting bibliometric networks. The bibliometric approach undertaken in this paper encompasses several analysis indicators, including: the frequency and relevance of keywords, the co-occurrence network of keywords, the thematic map and temporal evolution of keywords, as well as the geographical distribution of scientific production and the scientific impact of national contributions measured by the number of citations.

## Results

The frequency analysis of keywords (Figure 1) reveals the overall thematic structure of the examined literature, providing a first insight into the central concerns of researchers in the field. The term with the highest frequency of occurrence is sustainable development (37 occurrences), followed by structural funds (35), impact (22), growth (21), cohesion policy (19), and policy (19). This distribution indicates that the examined literature significantly combines the discourse on European structural funds with the dimension of sustainable development, suggesting a reorientation of research towards the integration of sustainability objectives in the evaluation of European financial instruments. The presence in the top of the terms governance (14), regional development (14), and rural development (10) confirms that the analysis encompasses both the territorial-regional and sectoral dimensions of European funding policies, while concepts such as absorption (4) and efficiency (2) signal the persistence of concerns regarding the capacity to use funds.

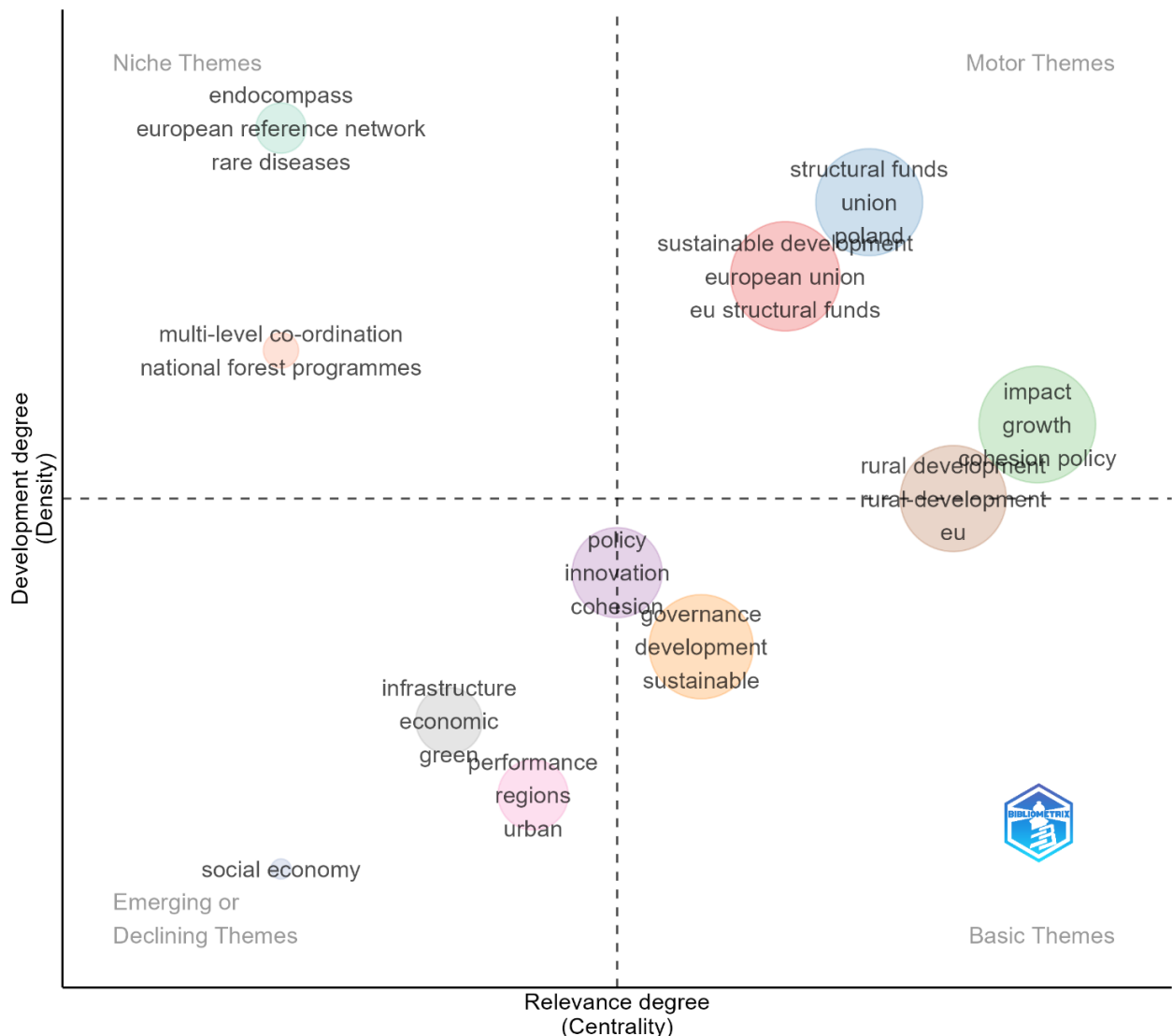


**Figure 1. Most occurred words**

*Source: Author's computation through Bibliometrix*

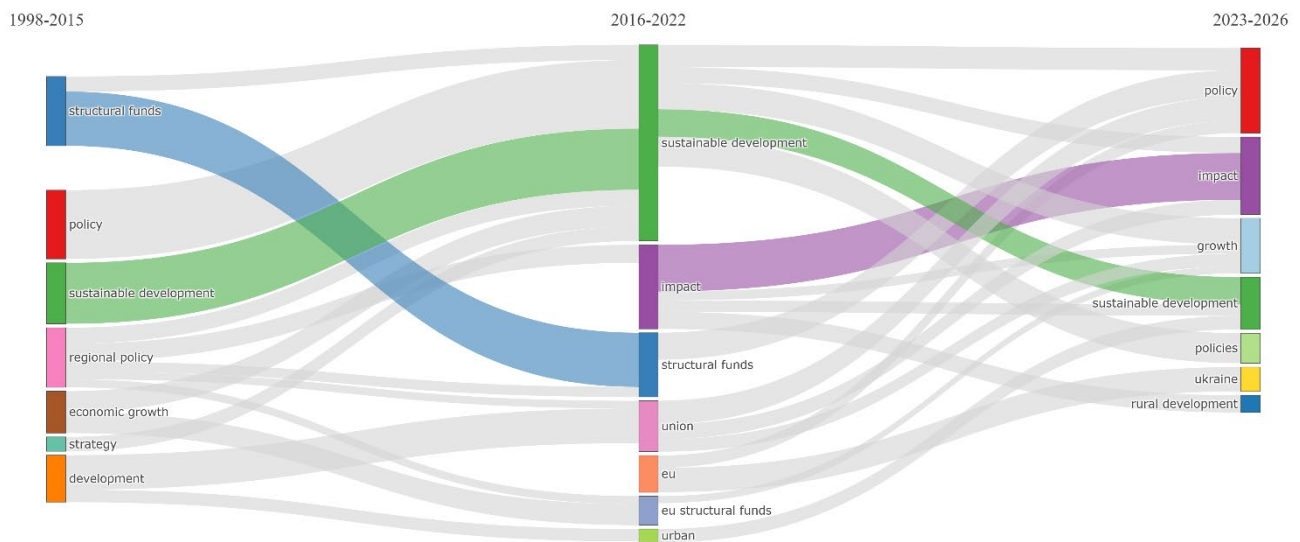
The keyword co-occurrence network (Figure 2) identified eleven thematic clusters, reflecting a more diverse intellectual structure than in previous studies on European funds. The first cluster, centered on the term sustainable development, brings together concepts such as rural development, the European Union, EU structural funds, and the common agricultural policy, outlining the axis of sustainability in the context of European funding policies. This central position of the term sustainable





**Figure 3. Thematic map of keywords**  
 Source: Author's computation through Bibliometrix

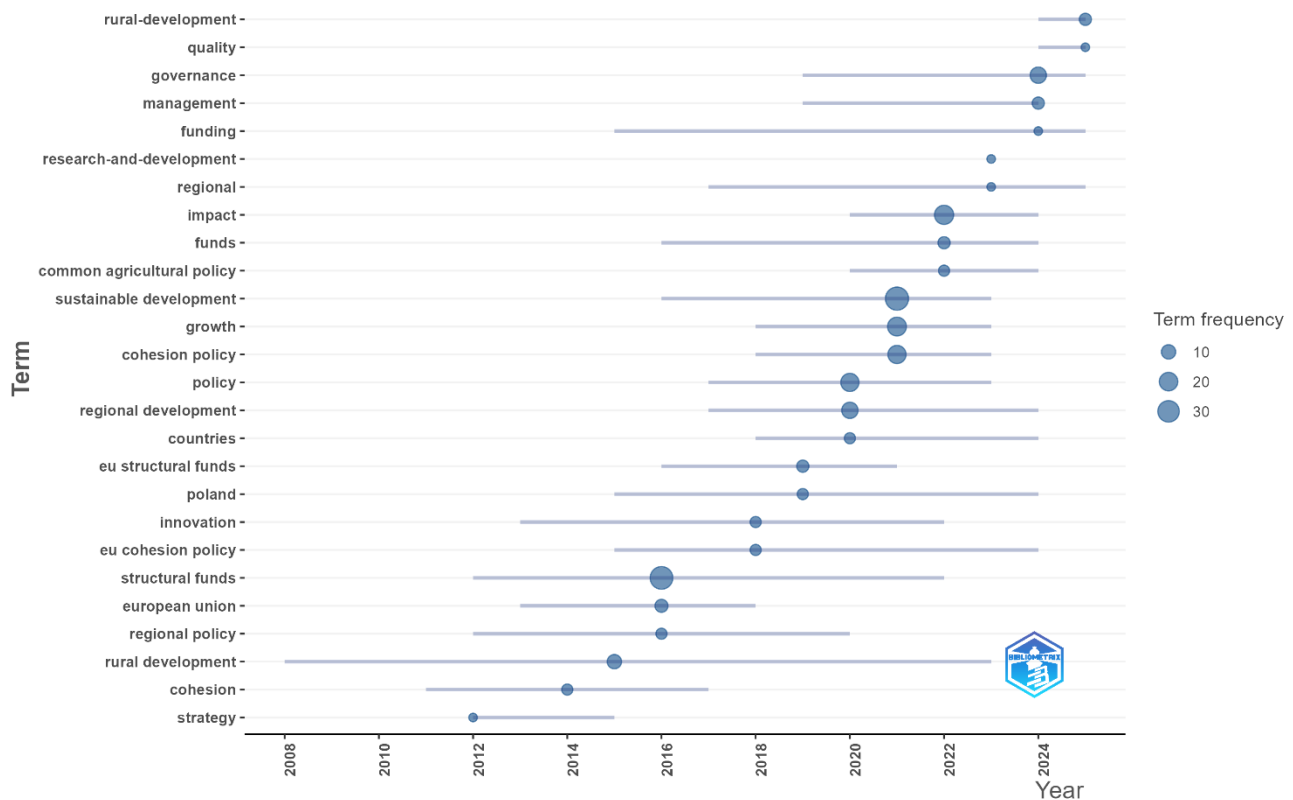
The analysis of thematic evolution (Figure 4), carried out over three time periods (1998–2015, 2016–2022, and 2023–2026), highlights the transformations that have occurred in the thematic structure of the specialized literature. In the first period, the academic discourse is structured around the axes of structural funds, economic growth, regional policy, and sustainable development, reflecting the analytical framework of the first programming cycles of the European funds and the debates on regional convergence. The term structural funds demonstrates remarkable continuity, maintaining a strong connection with itself and with cohesion policy throughout all three periods (stability index 0.091; PageRank cross-period 0.527). In the period 2016–2022, the axes of sustainable development and structural funds — both with high PageRank scores in this period — are consolidated, while new connections to themes such as policy, union, growth, and impact appear. The period 2023–2026 is dominated by a re-articulation of the thematic network: growth, impact, rural development, policy, and sustainable development become central nodes of attraction, signaling a shift in researchers' attention towards the long-term effects of cohesion policy, rural sustainability and the multiannual financial framework 2021–2027. The transition to terms such as governance and management in this latter period indicates the maturation of concerns related to institutional capacity and the quality of fund management.



**Figure 4. Thematic evolution of the keywords over three time intervals (1998-2015, 2016-2022, and 2023-2026).**

*Source: Author's computation through Bibliometrix*

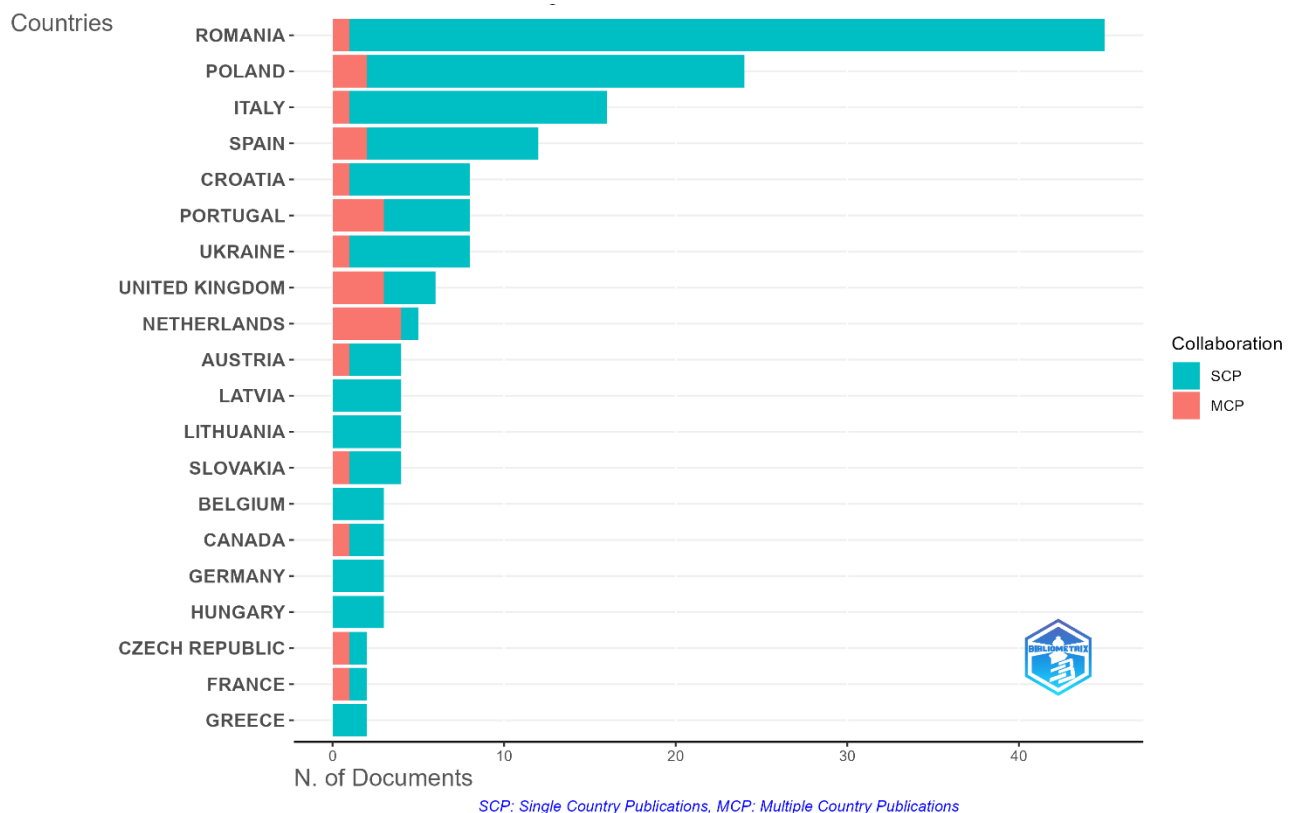
The trending topic analysis (Figure 5) highlights the temporal dynamics of scientific interest in the themes identified in the corpus, by reporting the median year of publication of the articles containing each term. The results indicate a clear transition from early concerns — centered on concepts such as strategy (median 2012), cohesion (median 2014) and rural development (median 2015) — to recent topical themes, such as governance (median 2024), management (median 2024), funding (median 2024), rural development (compound variant rural-development, median 2025) and quality (median 2025). The terms structural funds (frequency 35, median 2016) and the European Union (median 2016) represent the stable core of the academic discourse, around which emergent concepts that reflect contemporary concerns gravitate. Also notable is the appearance in the area of maximum relevance of the terms impact (median 2022), funds (median 2022) and common agricultural policy (median 2022), which suggests that recent literature is diversifying the analytical perspective from structural funds to sectoral mechanisms and the post-2021 multiannual financial framework.



**Figure 5. Trend Topics**

*Source: Author's computation through Bibliometrix*

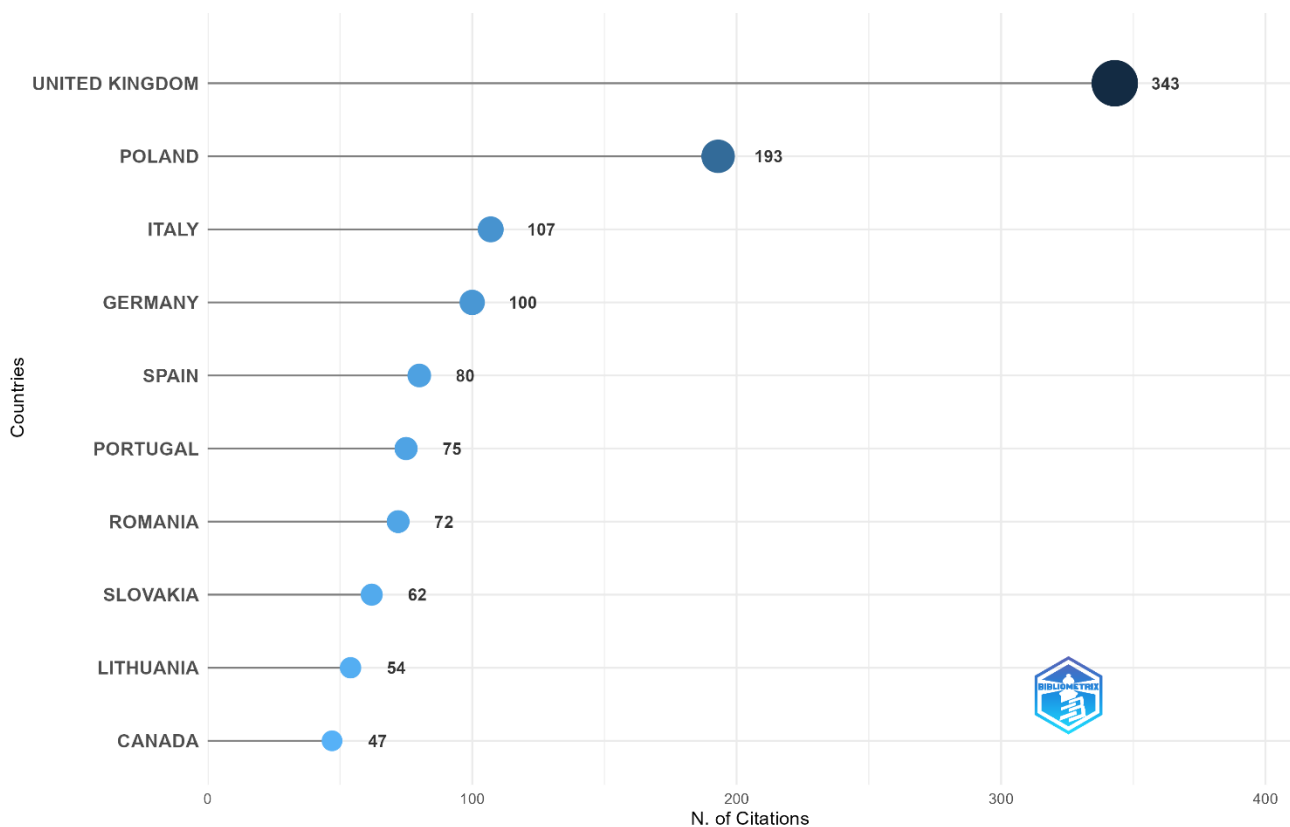
The analysis of the geographical distribution of corresponding authors (Figure 6) reveals a significant concentration of scientific production in a few European Union member states. Romania ranks first with 45 articles (25.28% of the total), followed by Poland (24 articles, 13.48%) and Italy (16 articles, 8.99%), which underlines the particular interest of researchers from the countries that are net beneficiaries of European funds in the analyzed issue. Spain (12 articles, 6.74%), Croatia, Portugal, and Ukraine (8 articles each, 4.49%) complete the top of the production, indicating a wide distribution among the Central and Eastern European states, which account for considerable shares of the total volume. In terms of international collaborations, the Netherlands has the highest rate of publications in international collaboration (MCP = 80%), followed by the United Kingdom (50%), the Czech Republic (50%), and France (50%), indicating a stronger integration of these countries into global research networks. In contrast, Romania (2.22%), Poland (8.33%), and Italy (6.25%) have relatively modest shares of international collaboration, suggesting that their academic output remains predominantly oriented towards national contexts.



**Figure 6. Corresponding Author's Countries**

*Source: Author's computation through Bibliometrix*

The analysis of citations by country of affiliation (Figure 7) highlights notable discrepancies between the volume of production and its scientific impact. The United Kingdom records the highest total number of citations (343) and the highest average of citations per article (57.2), signaling a particular influence of its contributions in the specialized literature. Germany ranks second in terms of average per article (33.3 citations/article, 100 total), followed by Poland (193 total citations, average 8.0), Italy (107 citations, average 6.7), and Spain (80 citations, average 6.7). Romania, the most prolific country in terms of production, records 72 total citations, with an average of only 1.6 citations per article, which suggests that although the volume of publications is high, their impact in the international academic community remains limited compared to contributions from Western European countries. A similar situation is observed in the case of Ukraine (average 0.9 citations/article) and Croatia (1.8), in contrast to Slovakia (15.5), Canada (15.7), and the United States (25.0), which, with more modest productions, record significantly higher citation averages. These discrepancies indicate that the international impact of research on European funds is generated mainly by contributions from Western European and English-speaking countries, while net beneficiary states numerically dominate production, but not academic visibility.



**Figure 7. Most Cited Countries**

*Source: Author's computation through Bibliometrix*

## Conclusions

The bibliometric analysis of the literature reveals a complex thematic dynamic, marked by the gradual convergence between the discourse on European structural funds and the sustainable development paradigm. If in previous periods the center of gravity of scientific production was occupied by the evaluation of the effectiveness of cohesion instruments and the macroeconomic impact of European investments, recent literature demonstrates a shift towards the qualitative dimensions of implementation — governance, institutional management, absorption capacity, and long-term sustainability. This transition reflects, on the one hand, the maturation of the academic field and the accumulation of a critical mass of evaluative studies, and on the other hand, the pressure exerted by the new priorities of the 2021–2027 multiannual financial framework, which explicitly integrates the objectives of the European Green Deal and the 2030 Agenda into the programmatic logic of the structural and investment funds. At the same time, the central position of the term sustainable development in the keyword co-occurrence network, with the highest intermediation score and PageRank index in the entire corpus, is not a simple lexical artifact, but indicates the epistemic restructuring of the field: European funds are increasingly evaluated not only in terms of direct economic effects, but also through their contribution to the green transition, multidimensional territorial cohesion and the achievement of sustainable development goals.

From the perspective of the geographical distribution of scientific production and impact, the analysis confirms a persistent pattern of decoupling between the volume of publications and international academic visibility. Romania, although it ranks first as a producer of specialized literature, with 45 articles and a share of 25.28% of the total number of corresponding authors, records an average of citations of only 1.6 per article, in clear contrast to the United Kingdom (57.2 citations/article) or Germany (33.3 citations/article). This asymmetry suggests that research from net beneficiary states of structural funds tends to concentrate in publications with limited international visibility, to use

national case studies with a low degree of theoretical generalization, and to remain mainly connected to local or regional academic networks, an aspect also confirmed by the low rate of international collaborations (MCP 2.22% for Romania, compared to 80% for the Netherlands). Remedying this impact deficit requires not only increasing the methodological quality of research but also a better integration of comparative perspectives, consolidated theoretical frameworks at the European level, and transnational inter-institutional partnerships, which can amplify the relevance and dissemination of contributions from the Eastern European space within the global academic community.

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