ESIF Policies and Their Impact on The Development of EU Members: A Review and Research Agenda

Adriana Z. F. C. NISHIMURA^{1*}, Manuel AU-YONG-OLIVEIRA², Maria José SOUSA³

¹Ph.D. Student, University of Aveiro, Department of Economics, Management, Industrial Engineering, and Tourism. GOVCOPP, Aveiro, Portugal; E-mail: adriana.nishimura@ua.pt

²Professor, Ph.D., INESC TEC, University of Aveiro, Department of Economics, Management, Industrial Engineering, and Tourism. GOVCOPP, Aveiro, Portugal; E-mail mao@ua.pt

³Professor, Ph.D., Business Research Unit (BRU-Iscte), University Institute of Lisbon (ISCTE-IUL), Lisbon, Portugal; E-mail: maria.jose.sousa@iscte-iul.pt

*Corresponding Author

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Abstract

The European Structural and Investment Funds (ESIF) represent the main instrument of European Cohesion Policy to sustain territorial development and to eliminate regional disparities between the EU member states. The study of the impacts of ESIF on the economic growth and development of EU members has gained increasing attention in the academic community, and there has been significant scientific production on this topic. This study consists of a bibliometric analysis of articles published in the period from 2011 to 2020 and indexed in two of the main scientific databases: Web of Science (WoS) and Scopus. The results of the bibliometric analysis point to relevant trends on the subject, such as the growing number of publications over the years; the great concentration of studies applied in Central and Eastern European (CEE) countries, namely Romania; and the current interest of researchers in important topics associated with European funds, such as the competitiveness and innovation of SMEs, climate change, economic impact of global crises, sustainable development, institutional capacity of organisations, and cross-border cooperation.

Keywords: ESIF Policy Analysis, Bibliometric Study, European Funds, European Development, Research Agenda

1. Introduction

The European Structural and Investment Funds (ESIF) are the main instrument of the European Union (EU) investment policy to support economic growth and develop the convergence of EU Member States (MS), fostering competitiveness and promoting the reduction of territorial disparities. For many EU members, funds represent the largest source of financial investment (European Commission, 2017), accounting for up to 70% of total investment.

In the last decade, studies on the programming, management, absorption and effectiveness of European funds have gained increasing interest from the international scientific community, mostly from the European Union, mainly due to the impacts of the global economic crisis (from 2008 to 2012) on the sustainable growth of member states. In the current pandemic context in which we find ourselves, responsible for an unprecedented economic and social crisis and the deepest global economic recession since the 1930s (OECD, 2020), the EU funding should gain even more prominence in society, since in addition to the multi-annual programming of ESIF, whose next period runs from 2021 to 2027, with expected resources of 1.07 trillion euros, a substantial amount of resources will be disbursed into the fund for the economic recovery of EU members, an additional amount of 750 billion euros, known as the “bazooka” (Dedola et al., 2020).

The European Commission (EC), in conjunction with the MS, has established a multiannual financial framework for the implementation of the European Structural and Investment Funds (ESIF), which were set up to promote the development and socio-economic cohesion of EU members, in an integrated, sustainable and harmonious manner (EUR-Lex, 1957). The five main European funds are: European Regional Development Fund (ERDF); European Social Fund (ESF); Cohesion Fund (CF); European Agricultural Fund for Rural Development (EAFRD); and the European Maritime Affairs and Fisheries Fund (EMFF).

The studies that assess the effectiveness of European funds in achieving their objectives are mostly represented by econometric analyses, and use indicators such as GDP Per Capita, Employment, Gross Value Added, among others. Apparently, there is no consensus among the authors on the effectiveness of the funds. Several studies have found positive effects on the economic growth of MS (Oliveira and Leitão, 2020; Becker et al. 2018; Gagliardi and Percoco, 2017; Maynou et al., 2014; Crescenzi and Giua, 2014; Fiaschi et al., 2011; Checherita et al., 2009; Bähr, 2008; Puigcerver-Peñalver, 2007; Ederveen et al., 2006; Beugelsdijk and Eijffinger, 2005; Dall’erba, 2005; Rodríguez-Pose and Fratesi, 2004; Cappelen et al., 2003; De la Fuente and Vives, 1995). However, some of these studies refer to a few conditionalities, such as:

- the application of funds achieves a more significant effect in regions whose GDP per capita is below 75% of the EU

average (Fiaschi et al., 2011);

- there is a higher efficiency of funds in rural areas close to urban centres (Gagliardi and Percoco, 2017);
- funds produce immediate effects on the increase in per capita income, but these do not last beyond the programming period (Becker et al., 2018);

- incentives for education and human capital have a positive medium-term effect (Oliveira and Leitão, 2020). Malakhova et al. (2020) state that there is an economic gap between less developed and developed EU members.

Nevertheless, other studies (Mohl and Hagen, 2010; Dall'érba et al., 2009; Mohl and Hagen, 2008; Dall'érba and Le Gallo, 2008; Esposti and Bussoletti, 2008; Ederveen et al., 2003; Garcia-Milá and McGuire, 2001; Boldrin and Canova, 2001; Sala-i-Martin, 1996) have found practically no significant effects of the funds on the economic growth of EU members, or even negative effects in the long run.

The EU budget for the programming period of 2014-2020 was approximately of 640 billion euros. Figure 1 exhibits the distribution of total budget by MS, according to the typology of the funds. In addition to the main five funds (ERDF, ESF, CF, EAFRD and EMFF), it includes the Youth Employment Initiative

(YEI), which was topped up in 2017 for regions with youth unemployment higher than 25% in 2016 (EU Data, 2021).

Due to the relevance that this topic has gained, it is important to know the scientific production on the impact of ESIF for the economic growth and development of the EU members in the last decade (from 2011 to 2020).

The data collection for this study is based on Bibliometric Analysis, a quantitative and statistical technique that allows measuring indices of knowledge production and dissemination, tracking the development of multiple scientific areas and the patterns of authorship, publication and use of research results (Costa et al. 2012; Okubo, 1997; Araújo, 2006). The contributions and novelty of this work can be attributed to the fact that no other bibliometric study was found that specifically used the search terms adopted in this data collection.

The remainder of this paper is structured as follows. The second section describes the research methods for this bibliometric analysis. The fourth section describes and discusses the empirical results. Finally, the fifth section presents our final conclusions, limitations of the study and prospects for future research.

Figure 1: Total ESIF budget by country (EC data, 2021)

2. Methodological Approach

2.1 Bibliometric Analysis

This research is based on a bibliometric analysis, which is a quantitative and statistical technique that allows the measurement of knowledge production and dissemination indexes, monitoring the development of several scientific areas and the standards of authorship, publication and the use of research results (Costa et al. 2012; Araújo, 2006; Okubo, 1997).

Previously referred to as Statistical Bibliography, the term Bibliometrics was consolidated by Pritchard (1969), with the publication of the article "Statistical Bibliography or Bibliometrics?". The Information Science known as Bibliometrics is performed by different metrics, which measure scientific production and its importance, either in terms of an author, an institution, a country, through its productivity (article count), to an article through its relevance, influence on other researchers (number of citations), or to a journal through the relevance of the articles published (impact factor) in recent years (University of Lisbon, 2021).

According to Župič and Čater (2015), synthesizing past

research findings is one of the most important tasks for advancing a particular line of research; and bibliometric methods provide a useful aid in literature reviews even before the reading begins, guiding the researcher to the most influential works and mapping the field of research free of subjective bias, common in literature reviews.

2.2 Data Collection

Data collection was carried out on two of the most relevant scientific databases: Clarivate Analytics' Web of Science (WoS) and Elsevier's Scopus, during the period from 12 to 20 October 2020.

2.3 Search Criteria

The search criteria adopted was guided to map the scientific production related to the object of the study: the European structural and investment funds (ESIF), and their relationship with the development and economic growth of the EU members. The search expressions with Boolean operators were limited to the terms (Chart 1):

European funds OR ESIF OR European structural and investment funds
AND development OR economic growth OR economic impacts

Chart 1: Search expressions

We searched for documents that contained these terms in the title, abstract or keywords, and limited the search to articles published in journals, in the last ten years (2011-2020). All areas of knowledge were considered in the search. The reason for limiting the type of documents to articles is that their publication processing is more accredited, as they are based on recognized evaluation criteria, such as blind peer-review (scientific arbitration).

The search resulted in three different samples of documents: articles from Scopus (n = 124), articles from Web of Science (n = 104) and the sum of all articles from the two databases, excluding duplicates (n = 170), as 58 articles are common to the Scopus and WoS databases.

2.4 Bibliometric Analysis Categories

The bibliometric analysis categories of this study were selected from the main indicators available in the Scopus and Web of Science databases and take into account the categories consolidated in the literature on bibliometric analysis. Thus, the categories of bibliometric analysis for this study are the following:

1. Year of publication
2. Authorship

When comparing the distribution of articles published in the Web of Science (n=104) and Scopus (n=124) databases over the years under analysis (Graph 1), we can observe in WoS a generally increasing trend until 2017, when it reaches the maximum number of publications (24), followed by a drop in 2019, and a rise in 2020. 90% of WoS publications are

3. Source (journals)
4. Country
5. Affiliation
6. Subject area
7. Funding sponsorship
8. Language
9. Open access
10. Factor impacts
11. Keywords
12. Research agenda and trends

2.5 Statistical Data Analysis

The data mined from the two databases were exported to Microsoft Excel, and statistical analyses were applied, for each of the categories listed in the previous subsection.

3. Results and Discussion

The results of this study will be presented and discussed by the categories defined for the bibliometric analysis, as shown in the former section.

3.1 Year of publication

concentrated in the period from 2016 to 2020. In turn, publications in Scopus were more distributed over the years, reaching their peak in 2019 (22), and followed by a steep drop in 2020, when it returned to the initial number of articles of 2011 (8). The average number of articles published per year in Scopus was 12.4, and in WoS, 10.4.

Graph 1: Documents by year- Scopus vs WoS

Graph 2 shows the sample distribution of the total non-duplicated articles from the WoS and Scopus databases (n = 170), where we can observe a higher concentration of articles

published in the years 2017 and 2018 (28 in both years), and a decreasing trend since then. For this sample, an average of 17,0 articles were published per year.

Graph 2: Documents by year- Scopus + WoS

3.2 Authorship

The articles found in Scopus database were written by 254 different authors, and the authors with the largest number of documents are Bostan, I., Hapenciuc, C.V., Moroşan, A.A. and Stanciu, P., with 3 articles each. In the WoS database, articles

were written by a similar number of authors (258), and the authors with the highest number of articles are Neculita, M., with 5 articles, followed by Vladu, M., Cretu, D., with 4 articles each; and Mogodan, A., with 3 articles. These authors are all from Romania. Graphs 3 and 4 present the authors who wrote at least 2 articles, as the main author or co-author, and refer to the Scopus and WoS Databases, respectively.

Graph 3: Documents by author - Scopus

Graph 4: Documents by author – WoS

3.3 Source (journals)

As for the source of the documents, the articles from the Scopus database sample (n = 124) were published in 78 different journals. The journal with the highest number of articles is Quality - Access to Success, with 26 documents, which corresponds to 20.9% of the sample. In turn, the articles from the WoS database sample were published in 69 different journals, and the most represented is the Scientific Papers-Series Management Economic Engineering in Agriculture and Rural Development, with 14 documents (13.5% of the sample),

followed by Quality - Access to Success, with 5 documents (4.8% of the sample). Graphs 5 and 6 demonstrate journals that had more than 2 documents published in the Scopus and WoS databases, respectively.

The Quality - Access to Success Journal, from Romania, presents an H Index 20, and a Q3 in the Business, Management and Accounting area, in the Scimago Journal & Country Rank (SJR). The Scientific Papers-Series Management Economic Engineering in Agriculture and Rural Development is not indexed in the Scopus database, the reason why it is not ranked by SJR.

Graph 5: Documents by source - Scopus

Graph 6: Documents by source – WoS

In the sample of non-duplicated articles from the WoS and Scopus databases ($n = 170$), the articles were published in 105 different journals. Graph 7 shows journals that have had more than 3 publications in the period of analysis. The first position is

for Quality - Access to Success Journal, with 26 documents, followed by Scientific Papers-Series Management Economic Engineering in Agriculture and Rural Development, with 14 documents.

Graph 7: Documents by source - Scopus + WoS

3.4 Country

The articles found in the Scopus Database are from 24 different countries, represented in 135 documents (taking into account the co-authorships). The country that published the most is Romania, with 55 documents (40.7% of the sample), followed by Spain, with 13 documents (9.6%), Poland, with 11 documents (8.1%), the Netherlands, with 8 documents (5.9%), Italy and Portugal, with 7 documents each (5.2%) and Belgium, with 5 documents (3.7%).

In turn, the articles found in the WoS Database also come

from 24 different countries, but six of them differ between the two databases: Croatia, Latvia, Oman, Serbia, Ukraine and Greece, with one document each. The country that published the most is also Romania, with 41 documents, corresponding to 32.8% of the sample, followed by Poland, with 14 documents (11.2%), Spain, with 13 documents (10.4%), Portugal, with 7 documents (5.6%), the Netherlands, Italy and the United Kingdom with 6 documents each (4.8%), and Belgium, with 5 documents (4.0%). Graphs 8 and 9 show the document count by country in the Scopus and WoS databases, respectively.

Graph 8: Documents by country - Scopus

Graph 9: Documents by country – WoS

If we consider the spatial distribution of where the studies were empirically applied (which does not always correspond to the location of the authors' home institution), the sample of 170 non-duplicate articles does not have a normal distribution across the 28 EU members (before the UK left the EU), as

shown in Graph10. For this sample, the MS that presented the highest application of the studies were Romania, with 74 articles, followed by Poland (21 articles), Spain (20), Italy (10), and Portugal (8).

Graph 10: Spatial distribution of the studies (Scopus + WoS)

Additionally, if we consider the empirical application of non-duplicated studies ($n = 170$) by European regions where they were applied (graph 11), we have a predominance of Central

and Eastern Europe (CEE), with 66% of the studies, followed by Southern Europe (18% of the studies), and EU cross-border studies (12%).

Graph 11: Empirical application of the studies (Scopus + WoS)

3.5 Affiliation

In the Scopus database articles are from 127 different institutions of affiliation. The most representative institution is Bucharest University of Economic Studies, which published 22 documents, corresponding to 17.7% of the articles, followed by Universitate a Stefan cel Mare din Suceavac, with 7 documents (5.6%) and Academia Româna, with 4 documents (3.2%). All of them are Romanian. As for the WoS database, articles are from

121 different institutions. The institutions that have published the most are also from Romania. The first one is Bucharest University of Economic Studies, with 14 documents (13.5% of all documents), followed by the University of Agronomic Science Veterinary Medicine Bucharest, with 9 documents (8.7%), Dunarea de Jos University Galati, with 5 documents (4.8%) and University of Craiova, with 4 documents (3.8%). Graphs 12 and 13 exhibit institutions that had more than 2 documents published in the Scopus and WoS databases, respectively.

Graph 12: Documents by affiliation – Scopus

Graph 13: Documents by affiliation – WoS

3.6 Subject Area

The Scopus database refers to 18 different subject areas for classifying the selected articles, as shown in graph 14. The area that presents the greatest representativeness is Social Sciences, with 60 articles classified (48.4% of total documents), followed by Business, Management and Accounting, with 44

articles (35.5%), Economics, Econometrics and Finance, with 27 articles (21.8%); and Environmental Science, with 23 articles (18.5%). For the WoS database (graph 15), the articles were classified in 25 different areas. The most prominent areas are Business Economics (31 articles, representing 29.8% of total documents), followed by Agriculture (19 articles, 18.3%), Environmental Sciences Ecology (14 articles, 13.5%); and Geography (12 articles, 11.5%).

Graph 14: Subject area - Scopus

Graph 15: Subject area - WoS

3.7 Funding sponsorship

Regarding the sponsorship of the publications, in the Scopus Database (graph 16) there are 21 different sponsors.

individually or in cooperation, that financed a total of 28 articles, corresponding to 22.6% of the sample. In the WoS database (graph 17) there are 25 different sponsors that financed 24 papers (23.1%).

Graph 16: Funding sponsor - Scopus

Graph 17: Funding sponsor - WoS

3.8 Language

As shown in Graph 18, most of the documents analysed

were written in English (84.7% of the Scopus articles and 83.7% of the Web of Science articles), followed by Spanish (4.0% of the Scopus articles and 7.7% of the WoS articles) and Romanian (4.8% of the Scopus articles).

Graph 18: Language – Scopus vs WoS

3.9 Open access

Open Access types available in Scopus, besides all open access, are gold open (documents that are in journals which only publish open access); hybrid gold (documents that are in journals which provide authors with the choice of publishing

open access); bronze (published version of record or manuscript accepted for publication. The publisher has chosen to provide temporary or permanent free access); and green (published version or manuscript accepted for publication, available at a repository). As shown in graphs 19 and 20, Scopus performs a good percentage of open access. 86% of Scopus articles (n=124) are open access.

Graph 19: Scopus open access count

Graph 20: Scopus open access count by types

In the Web of Science (graphs 21 and 22), open access types are slightly different. The open access status can be one of the following: gold DOAJ (articles published in journals listed on the Directory of Open Access Journals (DOAJ), for which the journals must have a license in accordance with the Budapest Open Access Initiative); gold other (open access articles not

listed on the DOAJ, most of them are hybrid journals); bronze (free access to an article for a limited time); green published and green accepted (final published or accepted manuscripts). WoS open access status is not as extensive as Scopus (59.6% of the 104 WoS articles were open access, about 33% less than Scopus).

Graph 21: WoS open access count

Graph 22: WoS open access count by types

3.10 Factor impact

Times Cited

Times Cited is one of the most important metrics of factor impact. It represents the number of citations for a scientific publication. In the sample of articles from the Scopus database (n=124), the sum of all citations, which occurred in the period from 2011 to 2020, added up to 417. The average number of citations per article was 3.4, in an interval from 0 to 98 citations. 56 articles were never cited (45.2% of the sample), 23

articles were cited once (18.5%), 13 articles were cited twice (10.5%), 5 articles were cited three times (4.0%), 2 articles were cited four times (1.6%), 8 articles were cited five times (6.5%), 3 articles were cited six times (2.4%), 1 article was cited seven times (0.8%), 2 articles were cited eight times (1.6%), 2 articles were cited nine times (1.6%), 1 article was cited ten times (0.8%), 2 articles were cited 11 times (1.6%), 1 article was cited 18 times, 1 article was cited 20 times, 1 article was cited 21 times, 1 article was cited 27 times, 1 article was cited 30 times and 1 article was cited 98 times, each one corresponding to 0.8% of the sample. Table 1 shows the four most cited articles on the Scopus database.

Title	Author	Journal	Year of publication	Times Cited
An assessment of the regional potential for solar power generation in EU-28	Castillo, C.P.; Silva, F.B.E.; Lavalle, C.	Energy Policy	2016	98
Guest editorial on research and innovation strategies for smart specialisation in Europe: theory and practice of new innovation policy approaches	Landabaso, M.	European Journal of Innovation Management	2014	30
Rebalancing EU interest representation? Associative democracy and EU Funding of Civil Society Organizations	Salgado, R.S.	JCMS-Journal of Common Market Studies	2014	27
Cohesion policy after Brexit: the economic, social and institutional challenges	Bachtler, J.; Begg, I.	Journal of Social Policy	2017	21

Table 1: Most cited articles in Scopus

Graph 23 demonstrates the distribution of articles by times cited, on a logarithmic scale, where it is observed that the great majority of articles were cited less than 10 times.

Graph 23: Scopus articles times cited

In turn, articles from the Web of Science database (n=104), led to a total of 292 citations, in the period from 2011 to 2020. The average number of citations per article was 2.8, in an interval from 0 to 79 citations. 50 articles were never cited (48.1% of the sample), 18 articles were cited once (17.3%), 8 articles were cited twice (7.7%), 7 articles were cited thrice (6.7%), 4 articles were cited four times (3.8%), 4 articles were cited five times (3.8%), 1 article was cited six times 1.0%), 4

articles were cited seven times (3.8%), 2 articles were cited eight times (1.9%), 2 articles were cited nine times (1.9%), 1 article was cited 11 times, 1 article was cited 15 times, 1 article was cited 28 times, and 1 article was cited 79 times, each one corresponding to 1.0% of the sample. Table 2 shows the four most cited articles on the WoS database, three of them are the same as in the Scopus database. Graph 24 demonstrates the distribution of articles by times cited, on a logarithmic scale, where the great majority of articles were cited less than 10 times as well.

Title	Author	Journal	Year of publication	Times Cited
An assessment of the regional potential for solar power generation in EU-28	Castillo, C.P.; Silva, F.B.E.; Lavallo, C.	Energy Policy	2016	78
Rebalancing EU Interest representation? Associative democracy and EU Funding of Civil Society Organizations	Salgado, R.S.	JCMS-Journal of Common Market Studies	2014	28
Cohesion policy after Brexit: the economic, social and institutional challenges	Bachtler, J.; Begg, I.	Journal of Social Policy	2017	15
Using a VGI and GIS-Based multicriteria approach for assessing the potential of rural tourism in Extremadura (Spain)	Gonzalez-Ramiro, A.; Goncalves, G.; Sanchez-Rios, A.; Jeong, J.S.	Sustainability	2016	11

Table 2: Most cited articles in WoS

Graph 24: WoS articles times cited

Graph 25 shows a comparison between the Scopus and Web of Science samples of articles, presenting the times cited over the period from 2011 to 2020.

Graph 25: Citation count by year – Scopus vs WoS

Field-Weighted Citation Impact

Elsevier's Field-Weighted Citation Impact (FWCI) is the ratio of the total citations actually received by the denominator's output, and the total citations that would be expected based on the average of the subject field. A Field-Weighted Citation Impact <1 means that the output is cited less than expected according to the global average and >1 means that the output

is more cited than expected according to the global average. For example, 1.48 means 48% more cited than expected.

For the Scopus articles ($n=104$), 61 documents present this metric, which correspond to 58.7% of the sample. The average Field-Weighted Citation Impact was 0.97, in an interval from 0.08 to 6.02. Graph 26 presents the FWCI distribution of the 61 articles. We can note that most of the scores are concentrated below the average quartile line.

Graph 26: Field-Weighted Citation Impact – Scopus

H-Index

The Hirsch's *h-index* is defined as the maximum value of h such that the given author/journal has published h papers that have each been cited at least h times. The index is designed to improve upon simpler measures such as the total number of citations or publications. The average H-index of WoS analysed articles was 8. The Scopus database does not present the average of this index in a research citation report.

3.11 Keywords

In the sample of non-duplicate articles from the WoS and Scopus databases ($n = 170$), a total of 811 author keywords were found, of which 580 are distinct from each other. Then a clustering of keywords with the same meaning was applied (e.g., cohesion funds = cohesion fund, EU funds = European funds), which resulted in 525 different words. Table 3 shows the 45 most frequently grouped keywords, which appear at least 3 times.

Most frequent keywords (> 3 occurrences)	Occurrences
European fund(s)/EU funding/EU funds/European Union Funds/The European funds/Funding/Funds	55
ESIF/EU structural and investment funds/European structural and investment funds/Structural funds	24
Cohesion policy/Cohesion policy of the European Union/EU Cohesion policy	22
Regional development/Development regions	16

Sustainable development	13
EU/European Union/The European Union/The EU	12
Investment(s)	7
Romania	7
Rural development	7
EU regional policy/European regional policy/Regional policy	6
Agriculture	5
Efficiency	5
Smart specialisation	5
Absorption rate	4
Cohesion Fund(s)	4
Convergence	4
Development	4
ERDF/European Regional Development Fund	4
Evolution	4
Extremadura	4
Geographic(al) information system(s)/GIS	4
Operational program(s)	4
Absorption	3
Absorption capacity	3
Absorption of EU funds/European funds absorption	3
CAP/Common agricultural policy	3
Central and Eastern Europe	3
Cross-border collaboration/Cross-border cooperation (CBC)	3
Economic(al) development	3
Economic growth	3
Europe 2020/Europe 2020 strategy	3
European financial support/European financing/European support funds	3
Herfindahl-Hirschman index/The Herfindahl-Hirschman index	3
LEADER method/Leader method (2007-2013)	3
National Rural Development Programme 2007-2013/NRDP (Romania)	3
Poland	3
Principal component analysis	3
Project(s)	3
Regional economy/Regional economics	3
Regionalisation	3
Risk(s)/@Risk	3
Rural area(s)	3
SMEs (Small and medium-sized enterprises)	3
Social accounting matrix(ces)	3
Strategy(ies)	3

Table 3: Most frequent keywords

In order to illustrate the most used keywords by the authors, word clouds were created using the software called MAXQDA Analytics Pro. Figure 2 presents the cloud of one keyword, and

Figure 3 displays the cloud of two keywords. The keywords that appear at least 3 times were considered.

Figure 2: One keyword cloud (Scopus and WoS data)

Figure 3: Two keyword cloud (Scopus and WoS data)

3.12 Research agenda and trends

The identification of the study themes and publication trends was instrumentalized by reading the abstracts of the 170 non-

duplicated articles, in a more qualitative approach. Table 4 summarizes the research agenda addressed by the studies, over the period 2011-2020.

Year	Empirical application	Themes of research
2011	Romania (7); Croacia (1)	Trends of investments in post-crisis period; environmental protection; Common Agriculture Policy (CAP); rural development; competitiveness and entrepreneurial initiatives for young people; internal audit in public institutions; absorption of EU funds; sustainable development (SD); EU budget and financial burden distribution principle; local communities' development; regional development (RD); use of renewable energy.
2012	Romania (5), BELL (1); CEE (1); Turkey (1)	Impacts of ESIF in world economic crisis; sustainable development; absorption of EU funds; ESF funds for human resources development; beneficiary's satisfaction; Performance of banking institutions by supporting EU funds; rural development; EU efficiency to support economic growth; Regional Development Agencies; agricultural exploitation.
2013	Romania (4); Italy (1); Portugal (1); Latvia (1); EU (1)	Cross-compliance requirements (audit); CAP; enhancing level of education and access to the regional labour market; legal aspects for RD; inequality and economic growth; SD of higher education and research; absorption rate of EU funds; knowledge platform for the water technology sector; rural development; territorial division and cultural identity.
2014	Romania (9); EU (2); CEE (1); Poland (1); Slovak Republic (1); Czech Republic and Hungary (1); Spain (1); 7 European border regions (1)	Recovery of economic differences between West and East Europe; Pan-European Transport Corridors; Cross-border health care collaboration (hospitals); agriculture, fisheries and regional specialisation; funding for Civil Society Organizations (CSO) and associative democracy; smart specialisation for research and innovation (RIS3); investments in an airport; integration of disabled people on the labour market; RD and economic cohesion reinforcement; agricultural and rural development, CAP; funds management; consumption of non-renewable resources; SD; labour productivity and employees indicators; absorption of EU funds (fiscal capacity and local administration); impact of Programme for Rural Development (SAPARD) on the tourism supply; restoration of historical heritage; strategic decision making for RD; ESIF impacts in the employment.
2015	Romania (7); Italy (2); Spain (2); Europe (1); 7 European border regions (1)	Cross-border health care collaboration (hospitals); Marketing-mix of financed projects; LEADER method; changes in rural landscapes; CAP; rural development (sectors of organic farming, freshwater aquaculture and poultry meat); knowledge platform for sustainable rural development; credit to agriculture; influence of the corruption on the EU funds absorption; SD; websites as a marketing tool to improve RD; economic impact of the withdrawal of ESIF using Computable General Equilibrium Model (CGE); CGE) for analyse the impact of ESIF for the regional growth.
2016	Romania (5); Poland (4); Spain (2); Hungary (1); Lithuania (1); UE (1)	Solar power generation; (RIS3); renewable sources in energy production; local conflicts in wind farms; development of forensic medicine; ERDF for the tourism economy; impacts of EU funds in the rural labour market (HR development and employment); RD and growth; economic SD after Brexit; cohesion policy for diminishing external migration; waste sector and rehabilitation of contaminated sites; rural tourism; geographic information platforms; LEADER method.

2017	Romania (8); Poland (5); Spain (4); EU (3); Italy (2); Hungary (1); Greece (1); France and Spain (1); UK (1); Slovenia (1); Poland and Ukraine (1)	Challenges in cohesion policy after 2020; SD strategy in the energy sector; development of health equity; Europeanization of CEO due to economic crisis; integrated territorial investment for local urban development; impacts of transition on agriculture and rural areas; impact of institutional quality on regional economic growth; rural sustainability of the meat (parma ham DPO); cohesion policy and RD; public space transformation at regional level; investments to agritourism farms due to infrastructure modernization; changes in the landscape of rural villages; economic development; rural development (blueberries crop, SAPARD); agri-environment; EU funds absorption; projects for healthcare education, in perspective of user satisfaction; SD with organic agriculture; impact of non-reimbursable funds for social economy; education in rural areas during the crisis; development of educational sector; effects of austerity in institutional change, work organization and employment relations; revitalization of cultural heritage; CF funding of cultural projects; LEADER Method; sustainable forest management due to climate-change; impacts on the cohesion policy after Brexit.
2018	Romania (6); Poland (4); Spain (4); EU (3); Portugal (2); Czech Republic (2); Portugal and Spain (1); South Europe (1), Russia (1), CEE (1); Germany and The Netherlands (1); Eurozone (1); 7 cities in Britain, Ireland, France, Germany, Spain and Italy (1)	Urban infrastructure of old industrial cities and effects of climate changes; administrative capacity of institutions for ESIF absorption; improvement of PA quality with ESIF (reform after 2000); financing of corporate social responsibility activities in sugar-producing; social cohesion in EU urban areas, at local level; efficiency of EU funds to RD considering the transport sector; spatial analysis of EU funds effectiveness on regional growth; RD administration - role of municipalities; spill-over effects of 2013 structural funds reform (crises management); human SD within engineering studies; management system for a stable regional growth; preferences of residents on the ESIF allocation for RD; the reform of 2013 into the EU cohesion policy and implications on macroeconomics indicators; international financial transfers for economic development; municipal sustainability influence in fostering economic and social development; effect of the ESIF on overall local authority performance; evaluation of smart cities strategies for a smart growth and competitiveness; results of an agro-food programme; risk management as a method to improve the absorption of EU funds; rural development with financing of subsistence farms; seismic protection measures to preserve heritage buildings; absorption of ESIF for agriculture and forestry products; analysis of regional innovation strategies of Russia with RIS3; funding for ecological tourism, with a sustainable environmental management; impacts of ERDF funds for RD (R&D, ICT, SMEs); impact of FEDER on the growth and employment; ESIF impacts on SD and urban environment; impact of the reform of the cohesion policy in post-2020 horizon.
2019	Romania (10); EU (3); Portugal (2); Poland (2); Italy (2); Slovak Republic (1); Czech Republic (1); CEE (1); Bulgaria (1); EU-15 (1); 11 EU north and western countries (1)	EU fund selectivity skill and profitability; income convergence effects of EU funds in spatial spill-overs; environmental development of municipalities; influence of the cohesion policy and spatial analysis on regional growth; impact of ESIF on economic growth; influence of cohesion policy for the EU image on the citizens view; RIS3 on Energy (hydrogen technologies H2020); impact of ERDF on new firms formation (SMEs); SD with healthy tourism ("age-friendly"); circular economy in the construction sector; SD of urban areas: Jessica initiative (ecosystem services); governance and innovation on rural territory for RD; impact of H2020 programme on RD; cohesion policy and RD; social services for elderly people; developing the social economy and HR for the metallurgical industry; econometric model for analysing the economic and social development; public private partnerships to accelerate the absorption of EU funds; rural development: investments for meat processing industry; absorption effects of EU funds for the competitiveness of SMEs; EU funds for historical monuments and cultural heritage; storage capacities of field crops production; SAPARD and competitiveness of fruit farms; impacts of public procurement in tertiary education sector.
2020	Romania (9); Poland (3); Bulgaria (2); Poland and Romania (1); Bulgaria and Romania (1); Portugal and Spain (1); Scotland-UK (1); Slovak Republic (1); UE (1); CEE (1)	EU funds for higher education institutions; big projects and development of municipalities; impact of ESIF for CEE socioeconomic development; efficiency and economic performance of EU funds for agriculture; development of digital rural hubs; RIS3 projects; RIS3 for competitiveness of SMEs in the textile and clothing sector; results of SMEs investments for innovation and competitiveness; development of transnational industrial policies (SMEs); cross-border cooperation of eurocities; audit analysis and absorption of EU funds; CAP evolution and absorption rate; impact of EU funds on rural development and rural entrepreneurship; EU funds for research, development and innovation (FP7 and H2020 programmes); cohesion policy and territorial distribution of financing; SD strategies for rural areas; promotion of gender equality and mainstreaming; long term planning for Partnership Agreement on social development.

Table 4: Themes of research and trends

4. Final Considerations

The mapping of bibliometric data of this study, collected from two of the world's leading scientific databases, is relevant for scholars analysing the impacts of European funds on the development and economic growth of EU members and the Cohesion Policy. From the data analysis, reported in the previous section, some considerations are allowed. First, referring to the year of publication of the articles, although the sample of 170 articles points to a slight decrease in articles from 2017, in 2020 there was an increase in publications in the WoS, while in Scopus there was a sharp drop from 2019 to 2020. There may be a connection to the Coronavirus pandemic context experienced in 2020. However, we highlight the fact that a large number of the articles indexed in WoS in 2020 were published in a single journal.

As for the authorship of the articles, there is a prevalence of Romanian authors at the top of the ranking of publications in both databases. The same trend can be observed for the journals with the highest number of publications (from Romania). As regards the countries that published the most articles, there is a concentration of institutions of affiliation in Central and Eastern European countries (the leader is Romania, followed by Poland), and then Southern European countries (Spain, Portugal, and Italy). However, there is some cooperation with other countries, namely the Netherlands, the United Kingdom and Belgium.

When looking at where the empirical studies were conducted, however, the concentration of production in CEE countries becomes even more visible. It corresponds to 66% of the studies, followed by the Southern European countries (18% of the studies).

Considering that CEE countries joined the European Union more recently, in the 2000s, and that they are more vulnerable economies in the European scenario, alongside the southern countries, it is plausible that the scientific interest of researchers reflects the applicability of European cohesion policy investments. It should also be remembered that the CEE countries were under the domination of the Soviet Union and the socialist regime for over 40 years and that after the collapse of the Warsaw Pact, the economies had to undergo a process of transition to a market economy, territorial decentralisation and democratisation. It is assumed that European aid had a key impact on this process from earlier on, when they received pre-accession funds. The studies from Romania particularly show a central concern with the absorption rate of EU funds, a concern which is transversal to the different domains and territorial coverage of the studies analysed herein.

Another result to highlight is that Scopus presented a much wider coverage of open access than Web of Science, although it cannot be assumed that the results found here apply to the majority of publications indexed in these databases.

In the analysis of data on impact factors, which is very important in a bibliometric study, it is noted that almost half of the articles analysed were never cited. There were rare articles that were cited many times, and they appear as outliers in the statistical analyses. However, an increasing trend was observed in the number of citations over the years, especially in 2020.

Regarding the subject and knowledge areas of the studies, most articles focus on the areas of Social Sciences, Economics, Management and Environmental Sciences. The main research topics include the impact of European funds on regional development and socio-economic growth, EU cohesion policy and its spin-offs, the use of smart specialisation platforms for innovation, development and research (RIS3), institutional capacity to absorb EU funds, rural and sustainable development in a variety of approaches (linked to the Common Agricultural Policy, spatial urbanisation, and some more innovative such as

rural tourism). From 2017, a theme that has gained more interest is the incentives given to foster the competitiveness and innovation of SMEs (which is compatible with the Europe 2020 strategy).

Other current and innovative topics addressed are the investments to tackle climate change, social and economic repercussions after Brexit, the use of knowledge platforms, the image of the European Union from the citizens' point of view, the circular economy, cross-border cooperation, the preservation of cultural heritage, health initiatives, social policy for elderly people, gender equality, employment and the labour market, and the impacts of the economic crisis on EU funding.

This study has some limitations. Firstly, the literature searched was retrieved from journals indexed only in the Scopus and Web of Science databases, and publications indexed in other databases were not analysed. Secondly, the terms defined for the research were limited to European funds, economic growth, development and economic impacts, and possible synonyms for these terms were neglected in the search, such as "subsidies", "aid", "funding", just to name a few. Thirdly, the choice of the term development for the search of articles may have created a bias with the term "sustainable development", which can be observed by the expressive amount of articles found on this topic. Another limitation of the study is that the search was restricted to the English language, which may certainly have left out other relevant documents.

As this study unfolds, there are many opportunities for future research. The study did not analyse the occurrence of networks and co-authorship relations, which can be addressed in other studies. In addition, research in other databases, such as Google Scholar, could enrich this work, with a single or comparative analysis. Furthermore, this study has restricted the criteria search to scientific journal articles. It would be certainly interesting to know what has been published on the subject in scientific conferences and other types of publication, such as books and book chapters. Bibliometric analysis is a vast science, which allows the use of different tools and a variety of developments.

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