THE EVOLUTION OF THE RESEARCH INTERESTS
AT THE FACULTY OF AGRI-FOOD AND ENVIRONMENTAL ECONOMICS

Marius **CONSTANTIN**[1], Simona Roxana **PĂTĂRLĂGEANU**[2], Mihai **DINU**[3]
[1] PhD Student, Bucharest University of Economic Studies
Email: constantinmarius15@stud.ase.ro
[2] Associate Professor, PhD, Bucharest University of Economic Studies
Email: rpatarlageanu@eam.ase.ro
[3] Assistant Professor, PhD, Bucharest University of Economic Studies
Email: mihai.dinu@eam.ase.ro

Abstract
The Faculty of Agri-food and Environmental Economics is a well-established educational and research leader in Romania in the field of economics, focused on agri-food and environmental sciences. Part of the Bucharest University of Economic Studies, the Faculty provides higher education according to the Bologna Process, consisting of three-cycle higher education systems: bachelor's, master's and doctoral studies. With many economists professionally trained over the years and with a group of professors focused on research activities with impactful contributions in the field of agri-food and environmental economics, it has become important to study the evolution of research interests manifested in the research papers elaborated by the tenured teaching staff of the Faculty of Agri-food and Environmental Economics. This research paper aims at highlighting the emerging research interests using a quantitative method: bibliometry, a branch of scientometry, based on the scientific papers indexed in the Web of Science until 20 September 2020. The main findings in this paper refer to the fact that waste management, food safety, carbon emissions and decision-making are the topics most frequently approached in the scientific papers indexed in the 2018-2020 period, while topics such as: land-use, agricultural insurance, ecosystems, water, marketing-research are specific to the 2012-2014 period.

Introduction

The Bucharest University of Economic Studies was founded in 1913 by Royal Decree and has been a point of reference in Romania's economic higher education scene for more than a century (Ionascu and Ionascu, 2013). In Romania, the higher education is harmonized according to the Bologna Process, based on the three-cycle higher education systems: bachelor's, master's and doctoral studies – each with its own contribution toward consolidating the future economist (Cardoso et al., 2008). Part of The Bucharest University of Economic Studies, the Faculty of Agri-food and Environmental Economics provides the following specialisations according to the curriculum (2020): Bachelor's studies: *AgroFood and Environmental Economics* specialisation; Master's studies – three specialisations: *Management of rural and regional development projects*, *Economics and administration of agro-food businesses*, *Ecological economics*.

The accreditation to grant doctoral titles in the field of economics was gained in 1921, at the level of the Bucharest University of Economic Studies. In 2020, there are ten doctoral programmes available and eleven Doctoral Schools, one of which is organized by the Faculty of Agri-food and Environmental Economics: Economics II Doctoral School.

The tenured teaching staff at the bachelor's and master's programmes of the Faculty of Agri-food and Environmental Economics is highly focused on research activities, with important contributions in this field, quantified from the perspective of the scientific papers indexed in prestigious databases. Table 1 comprises the list of tenured teaching staff.

Table 1. The tenured teaching staff at the bachelor's and master's programmes, 2020

No.	Academic Rank	NAME Surname
1	Professor	BOBOC Dan
2	Professor	BRAN Mariana
3	Professor	ISTUDOR Nicolae
4	Professor	MARCU Nicu
5	Professor	NEGREI Costel
6	Professor	POPESCU Gabriel
7	Professor	STOIAN Mirela
8	Associate Professor	CONSTANTIN Florentina
9	Associate Professor	DOBRE Iuliana
10	Associate Professor	DRĂCEA Raluca-Mihaela
11	Associate Professor	IGNAT Raluca
12	Associate Professor	ION Raluca Andreea
13	Associate Professor	LĂDARU Georgiana Raluca
14	Associate Professor	PĂTĂRLĂGEANU Simona Roxana
15	Associate Professor	PETRESCU Irina Elena
16	Associate Professor	RĂDULESCU Carmen Valentina
17	Associate Professor	ŞTEFAN Marcela
18	Associate Professor	TRICĂ Carmen Lenuta
19	Lecturer	ANTOHE Radu-Gheorghe
20	Lecturer	PREDA Elena
21	Lecturer	TEODOR Cristian
22	Assistant Professor	CIOBANU Laura
23	Assistant Professor	DIACONEASA Maria-Claudia
24	Assistant Professor	DINU Mihai
25	Assistant Professor	PIŞTALU Maria
26	Assistant Professor	ZAHARIA Alina

Source: The Faculty of Agri-food and Environmental Economics, www.eam.ase.ro

While there are twenty-six tenured teachers at the bachelor's and master's programmes at the Faculty of Agri-food and Environmental Economics, the Economics II Doctoral School organized by the Faculty has only fourteen. Eight of fourteen can also be found in Table 1.

Following, Table 2 comprises the list of Economics II Doctoral School Members allowed to coordinate doctoral students.

Table 2. The list of the Economics II Doctoral School Members, 2020

No.	Academic Rank	NAME Surname
1	Professor	ANDREI Jean-Vasile
2	Professor	BEGALLI Diego
3	Professor	BOBOC Dan
4	Professor	BRAN Florina
5	Professor	ISTUDOR Nicolae
6	Professor	MANOLE Victor
7	Professor	MARCU Nicu
8	Professor	MIHNEA Adriana
9	Professor	POPESCU Gabriel
10	Professor	STOIAN Mirela
11	Professor	VOICU Radu
12	Associate Professor	ION Raluca Andreea
13	Associate Professor	LĂDARU Georgiana Raluca
14	Associate Professor	RĂDULESCU Carmen Valentina

Source: Economics II Doctoral School, The Bucharest University of Economic Studies

In Romania, over the years, important contributions to the field of agri-food and environmental economics were made by the tenured teaching staff of The Faculty of Agri-food and Environmental Economics and by the Economics II Doctoral School Members, by their research papers indexed in prestigious databases.

The main objective undertook in this research paper is to study the evolution of research interests manifested in the research papers elaborated by the tenured teaching staff of the Faculty of Agri-food and Environmental Economics and Economics II Doctoral School Members. The aim is to highligh the emerging research interests in 2020, while identifying the themes that are less attractive compared now compared to the time when the first research papers were published and indexed. Moreover, another undertook objective is compare the research interests between the Economics II Doctoral School Members and those of the tenured teaching staff the Faculty of Agri-food and Environmental Economics.

Based on the objectives undertook in this paper, the research hypothesis is that topics related to recycling, waste management and to the circular flow of a new model of economy are getting more attention than topics such as land-use and agromarketing. We expect minor discrepancies in terms of the emerging research interests in the published research papers of the Economics II Doctoral School Members compared to research papers of the tenured teaching staff the Faculty of Agri-food and Environmental Economics.

1. Materials and methods

In order to respond to the research question and determine the evolution of the research interests based on the published and indexed research papers, the most convenient research method is the bibliometric analysis, a quantitative research method.

Scientometrics is a term used to describe the study of science: growth, evolution, structure, interrelationships and productivity (Hood and Wilson, 2011). As a science, scientometrics involves the study of the quantitative aspects of the process of science as a communication system and has become essential in the measurement and evaluation of research performance (Mingers and Leydesdorff, 2015). The emergence of the research of scientific communication determined the need to quantify, measure performance and determine trends based on pieces of science (publications), first as a "science of science", later developed and consolidated as a science (Ball, 2017).

Bibliometrics is a branch of scientometrics that focuses on the quantitative analysis of scientific publications for statistical purposes. This branch involves the elaboration of a complex inventory of publishing activities at the many levels: countries, institutions, fields of knowledge (Van Eck and Waltman, 2018). Bibliometrics is used for comparative studies of productivity in the scientific field. The academic research performance can be looked upon from the perspective of the total number of publications of a researcher or group of researchers as a measure of quantity, while the total number of citations of these publications represents a measure of the quality of the publications (Fenner et al., 2018).

In this paper, the evolution of the research interests was studied based on the information obtained from querying the Web of Science database. Web of Science was developed by Thomson Scientific and it is dominating the field of academic reference (Falagas et al., 2008). Originally produced by the Institute for Scientific Information (ISI), it is currently maintained by Clarivate Analytics. The database is one of the world's most extensive resources for citation, indexing, and citation analysis of a wide variety of scientific works in all possible scientific fields. Through all its scientific resources, Web of Science provides the basis for designing quantitative studies on research evolution in the most diverse fields, including in the fields of agri-food and environmental sciences.

This research was conducted using a software product, VOSviewer version 1.16.15, created by Nees Jan van Eck and Ludo Waltman at the Center of Science and Technological Studies of the University from Leiden. VOSviewer is a specialized software product in the field of bibliometrics. It facilitates to develop studies related to the keywords used in the scientific papers, highlight the links between the keywords. The keywords are associated to the indexed research papers in the Web of Science database. These VOSviewer feature are essential in the case of this research, considering the undertook objective to study the evolution of the research interests manifested in the research papers elaborated by the tenured teaching staff of the Faculty of Agri-food and Environmental Economics and Economics II Doctoral School Members. VOSviewer excels at mapping links between the words that appear most frequently in the documents for which the query was performed in the Web of Science database. The maps are designed based on a file extracted from the Web of Science database with the extension ".ciw".

There were two queries performed on September 20, 2020 in the Web of Science database, based on the following criteria. At the level of the tenured teaching staff at the bachelor's and master's programmes, the query was the following: *AUTHOR: (ISTUDOR, Nicolae) OR (PATARLAGEANU, Simona Roxana) OR AUTHOR: (ION, Raluca Andreea) OR AUTHOR: (PETRESCU, Irina Elena) OR AUTHOR: (IGNAT, Raluca) OR AUTHOR: (DRACEA,*

Raluca Mihaela) OR AUTHOR: (LADARU, Georgiana Raluca OR LADARU GR) OR AUTHOR: (TRICA, Carmen Lenuta) OR AUTHOR: (RADULESCU, Carmen Valentina) OR AUTHOR: (BOBOC, Dan) OR AUTHOR: (MARCU, Nicu) OR AUTHOR: (CONSTANTIN, Florentina) OR AUTHOR: (NEGREI, Costel) OR AUTHOR IDENTIFIERS: (AAG-8054-2019) OR AUTOR: (STOIAN, Mirela) OR AUTHOR: (BRAN, Mariana) OR AUTHOR: (DOBRE, Iuliana) OR AUTHOR: (STEFAN, Marcela) OR AUTHOR: (SPONTE, Maria) OR AUTHOR: (TEODOR, Cristian) OR AUTHOR: (DINU, Mihai) OR AUTHOR: (CIOBANU, Laura) OR AUTHOR: (ZAHARIA, Alina) OR AUTHOR: (DIACONEASA, Maria Claudia) OR AUTHOR: (PREDA, Elena) OR AUTHOR: (ANTOHE, Radu Gheorghe). This query returned a number of 324 scientific publications of the authors mentioned before and in Table 1, out of which 193 were articles (59.56%) and 121 proceeding papers (37.34%).
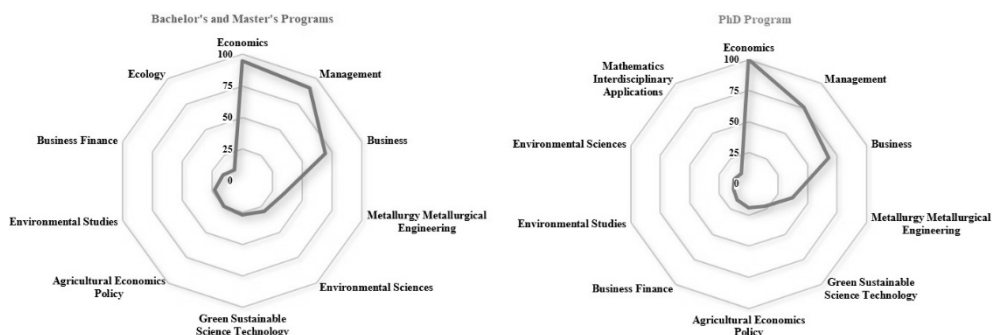
At the level of the Economics II Doctoral School Members, the second query was the following: *AUTHOR: (ISTUDOR, Nicolae) OR AUTHOR: (ION, Raluca Andreea) OR AUTHOR: (ANDREI, Jean Vasile) OR AUTHOR: (AGAPIE, Adriana) OR AUTHOR: (MIHNEA, Adriana) OR AUTHOR: (BEGALLI, Diego) OR AUTHOR: (LADARU, Georgiana Raluca OR LADARU GR) OR AUTHOR: (RADULESCU, Carmen Valentina) OR AUTHOR: (BOBOC, Dan) OR AUTHOR: (BRAN, Florina) OR AUTHOR: (MARCU, Nicu) OR AUTHOR: (MANOLE, Victor) OR AUTHOR: (VOICU, Radu) OR AUTHOR IDENTIFIERS: (AAG-8054-2019) OR AUTHOR: (STOIAN, Mirela).*

The second query returned a number of 259 scientific publications of the authors mentioned in Table 2, out of which 155 were articles (59.84%) and 94 proceeding papers (36.29%).

2. Research findings and discussions

Most of the publications felt under the "Economics", "Management" and "Business" Web of Science categories in both cases (query #1 vs query #2), as in Figure 1.

Figure 1. Publications per Web of Science categories and educational programs
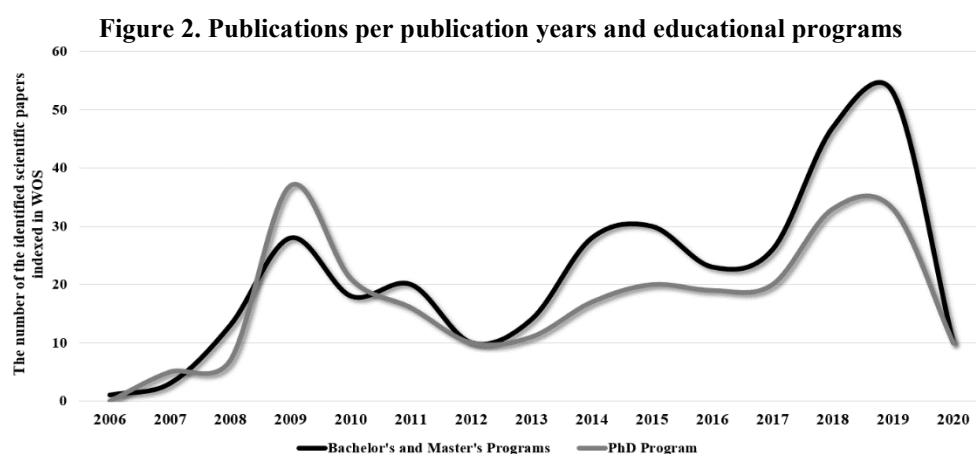

Source: Author's conceptualization, based on the Web of Science exported data

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What is specific to the Economics II Doctoral School is that the tenth most frequent Web of Science category based on the total number of the published scientific papers is the "Mathematics Interdisciplinary Applications" category.
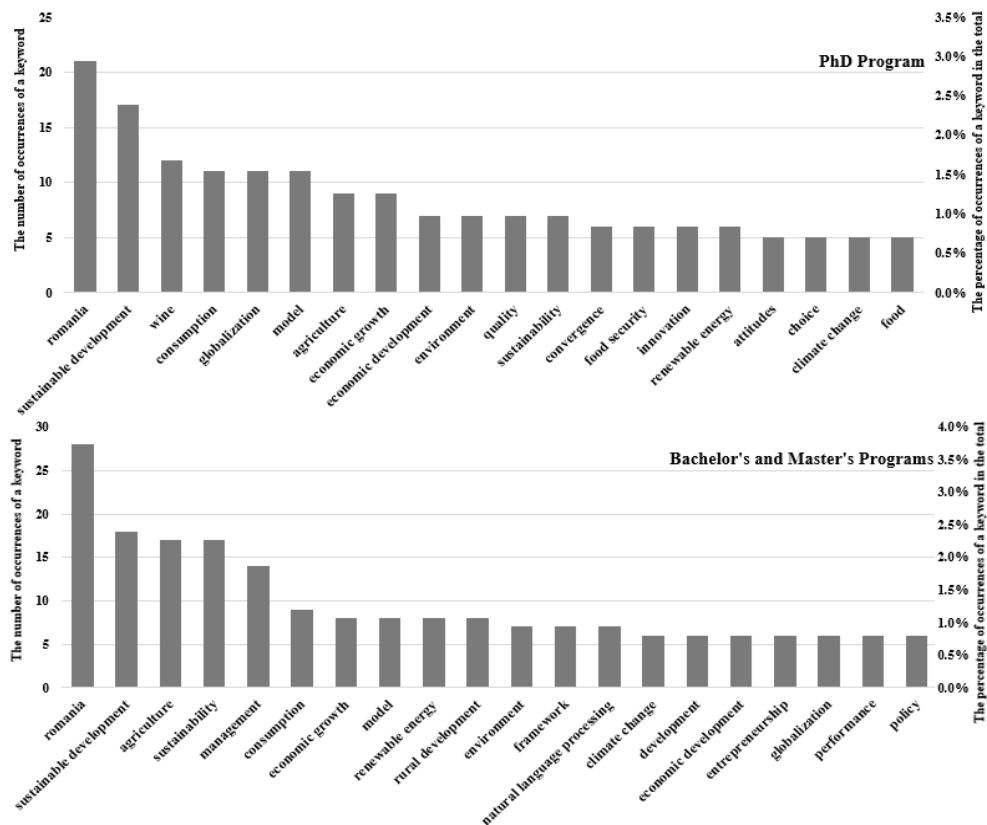
From a temporal perspective, most of the publications were indexed the Web of Science in 2019: 53 research papers in the case of the tenured teaching staff at the bachelor's and master's programmes (16.36% out of the total of 324 papers) and 33 research papers in the case of the Economics II Doctoral School Members (12.74% out of the total of 259 papers), as observed in Figure 2.

The first research paper indexed in the Web of Science is named "Approach on the application of Roland Berger analyze model in agriculture" (WOS:000245240200039). It was published in 2006 and has the following authors: Marioara Ilea and Pătărlăgeanu Simona Roxana. The first paper indexed in Web of Science associated to the second query (Economics II Doctoral School) was indexed in 2007.

Figure 2. Publications per publication years and educational programs

Source: Author's conceptualization, based on the Web of Science exported data
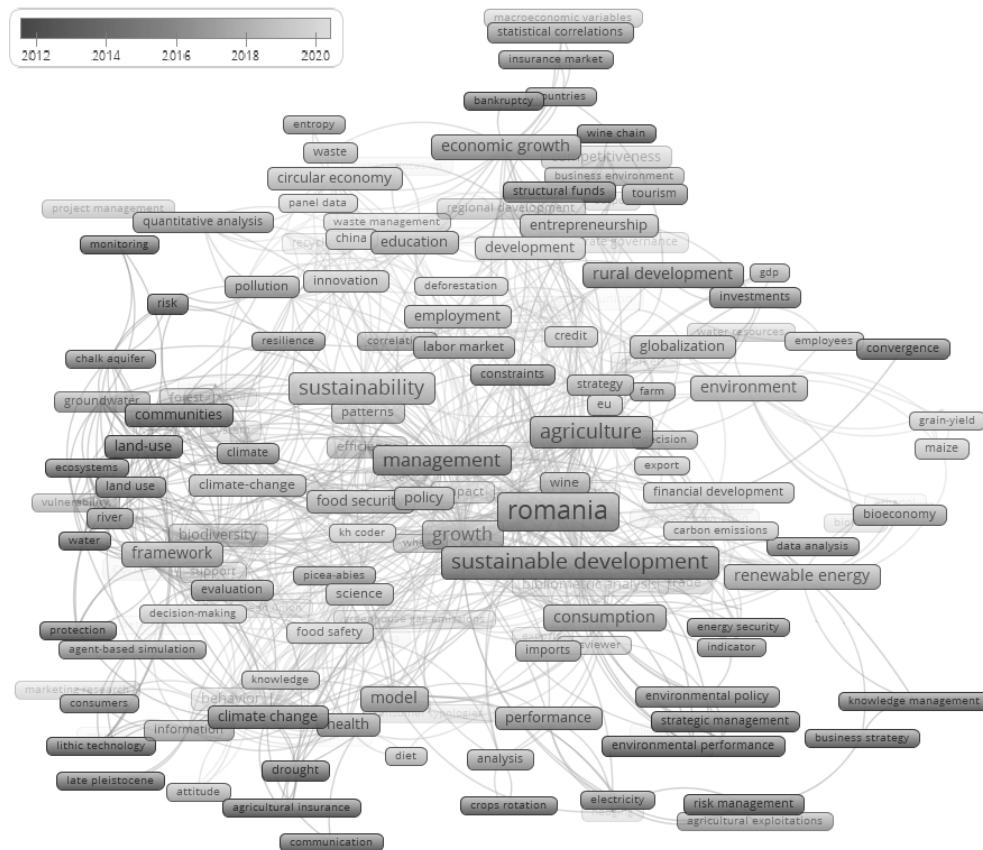
Figure 3. Top 20 most frequently occurring keywords associated to the publications, filtered per query (educational programs)

Source: Author's conceptualization, based on the Web of Science exported data

As in Figure 3, "sustainable development" is the second most frequently occurring keyword used by both the tenured teaching staff at the bachelor's and master's programmes and the Economics II Doctoral School Members. "Natural language processing", "rural development" and "entrepreneurship" are topics with higher importance for the tenured teaching staff at the bachelor's and master's programmes, while "wine", "innovation" and "attitudes" represent topics more important for the Economics II Doctoral School Members.
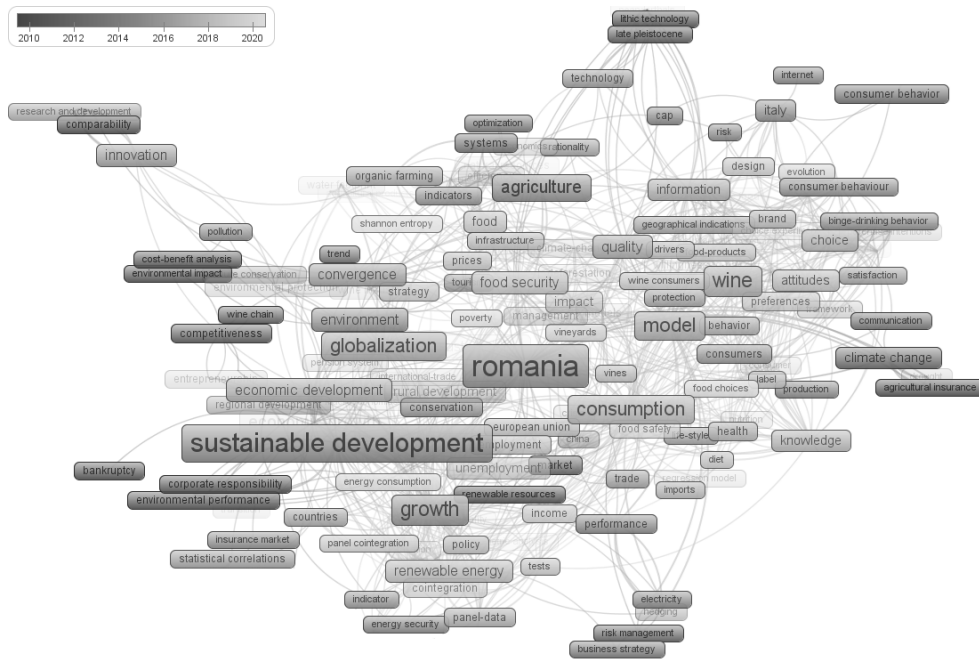
Figure 4. The evolution of the keywords associated to the publications of the tenured teaching staff at the bachelor's and master's programmes (first query)

Source: Author's conceptualization in VOSviewer, based on the Web of Science data

Considering the inital findings based on Figure 3, the last step before accepting the hypothesis that topics related to the circular flow of a new model of economy, recycling and waste management are getting more attention than topics such as land-use and agromarketing is to build a map of the evolution of the keywords based on occurance. Figure 4 was designed taking this into account. One can notice that "waste management", "carbon emissions" and "recycling", "circular economy", "food safety" are the keywords most frequently used in the scientific papers elaborated in the 2018-2020 period, while issues such as: land-use, agricultural insurance, ecosystems, water, groundwater, convergence, marketing-research, communication, were specific to the 2012-2014.

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Figure 5. The evolution of the keywords associated to the publications of the Economics II Doctoral School Members (second query)

Source: Author's conceptualization in VOSviewer, based on the Web of Science data

Figure 5 graphically illustrates the evolution of the keywords associated to the publications of the Economics II Doctoral School Members. Besides the previously mentioned keywords which validate the research hypothesis, there are new emerging interests observed via the keywords indexed in the 2019-2020 timeframe, such as: "shannon entropy", "poverty" and "choice experiment", "energy consumption", "deforestation". Topics such as "cost-benefit analysis", "competitiveness" and "regional development", "strategic management", "environmental policy" are seeing a decrease in attractivity in 2020, considering the intensity of the occurances as keywords in the publications indexed during the 2010-2014 timeframe in the Web of Science database.

Conclusions

The Faculty of Agri-food and Environmental Economics provides top-quality higher education services in Romania. Part of the Bucharest University of Economic Studies, the Faculty has consolidated its position of educational and research leader in the academia. The Faculty organizes bachelor's and master's programmes in economics, as well as a Doctoral School, Economics II Doctoral School.

In this paper, the evolution of the research interests of the tenured teaching staff at the bachelor's and master's programmes and of the Economics II Doctoral School members has been studied. The study of the evolution of the research interests was based on the published and indexed research papers of the authors according to the previously mentioned categories. The research method is the bibliometric analysis, based on the materials extracted from the Web of Science database.

The research hypothesis has been validated. The research interests related to the circular flow of a new model of economy, energy consumption, recycling and waste management are getting more attention in the 2018-2020 period, while research interests such as land-use, regional development and agromarketing were more popular in the 2010-2014 than in the 2018-2020 period.

This study can be extended and the same research methodology can be applied in order to study, for example, the evolution of the research interests of the Economics II Doctoral School students and compare it with the results discussed in this research paper. This type of search can be easily replicated in order to study the evolution of the research interests in the case of any other education institution.

References

1. Ball, R. (2017). An Introduction to Bibliometrics: New development and trends. Chandos Publishing.
2. Broadus, R.N. (1987). Toward a definition of "bibliometrics." Scientometrics, 12(5), pp.373–379.
3. Cardoso, A.R., Portela, M., Sá, C. and Alexandre, F. (2008). Demand for Higher Education Programs: The Impact of the Bologna Process. CESifo Economic Studies, 54(2), pp.229–247.
4. Falagas, M.E., Pitsouni, E.I., Malietzis, G.A. and Pappas, G. (2008). Comparison of PubMed, Scopus, Web of Science, and Google Scholar: strengths and weaknesses. The FASEB Journal, 22(2), pp.338–342.
5. Fenner, T., Harris, M., Levene, M. and Bar-Ilan, J. (2018). A novel bibliometric index with a simple geometric interpretation. PLoS ONE, 13(7).
6. Hood, W.W. and Wilson, C.S. (2001). The Literature of Bibliometrics, Scientometrics, and Informetrics. Scientometrics, 52(2), pp.291–314.
7. Ionascu, I. and Ionascu, M. (2013). 100 years of accounting as an academic discipline at the Bucharest University of Economic Studies: institutional context and epistemic views. Proceedings of the 8th International Conference Acounting and Management Information Systems (AMIS 2013), pp.1106–1121.
8. Mingers, J. and Leydesdorff, L. (2015). A review of theory and practice in scientometrics. European Journal of Operational Research, 246(1), pp.1–19.
9. The Bucharest University of Economic Studies (2020). The Faculty of Agri-food and Environmental Economics: Curriculum (SIMUR).
10. Van Eck, N.J. and Waltman, L. (2018). VOSviewer Manual. Leiden: Univeristeit Leiden.