

**TO THE SCIENTIFIC JURY
DEFINED BY ORDER №38/15.03.2021
OF THE RECTOR OF
VUZF UNIVERSITY
PROF. GR.VAZOV, PHD**

REVIEW

by prof. Daniela Feschiyan, PhD,

Department of Accounting and Analysis, Faculty of Finance and Accounting, UNWE.

Scientific area: "Accounting, control and analysis of economic activity".

Subject: dissertation for the award of the scientific degree "Doctor of Science", field of higher education 3. Social, economic and legal sciences, professional area 3.8. Economics

Author: prof. Virginia Ivanova Zhelyazkova, PhD

Topic: Management of Bank Risks in the Transition to Circular Economy

1. General description of the submitted materials

According to Order № 38 of 15.03.2021 of the Rector of the VUZF University prof. Grigorii Vazov, PhD I have been assigned to be member of the scientific jury under the procedure for defense of dissertation on “Management of Bank Risks in the Transition to Circular Economy” for obtaining the scientific degree “Doctor of Science” in the field of higher education 3. Social, economic and legal sciences, professional field 3.8. Economics. During the first session of the scientific jury, held on March 19, 2021, I was appointed as reviewer according to the current procedure.

The author of the dissertation is prof. Virginia Ivanova Zhelyazkova from VUZF University - Sofia.

Prof. Zhelyazkova has presented the following materials:

- Dissertation work for acquiring the scientific degree “Doctor of Science”;
- Author's abstract of the dissertation for the acquisition of the scientific degree "Doctor of Science";

- Information on the contributions in the dissertation work for acquiring the scientific degree "Doctor of Science";
- Information on the implementation of the minimum national requirements according to the Law on the Development of the Academic Staff in the Republic of Bulgaria (LASRB) and the Regulations for its implementation;
- Reference to the citations of the works of Prof. Zhelyazkova by other scientists;
- Three reviews for the implementation of scientific and applied projects managed by the candidate - one from the Bulgarian Stock Exchange and two from Postbank Bulgaria;
- Copies of the texts of the scientific publications of Prof. Zhelyazkova for the purposes of the present procedure;
- Summaries of the scientific publications of Prof. Zhelyazkova for the purposes of the present procedure;
- Curriculum vitae;
- Copy of the master's degree diploma;
- A copy of the diploma for educational and scientific degree "Philosophiae Doctor" (PhD);
- Abstract of the dissertation for the acquisition of the PhD.

Conclusion on item 1: The candidate Prof. Dr. Virginia Zhelyazkova has submitted a total of 15 scientific publications on the topic of her dissertation: one chapter from a book by an international research team, one study, 12 scientific articles and one scientific report. Of all publications, 4 are in Bulgarian and 11 are in English.

2. Biographical data about the candidate

Prof. Zhelyazkova was born in 1981 and completed her secondary education at the Ivan Vazov Language High School in Plovdiv. In 2004 she obtained a Bachelor's degree in International Relations at the University of National and World Economy - Sofia and a Master's degree in International Economic Relations in 2007 at the same university. After that she continued his studies at the PhD level at the Institute for Economic Research at the Bulgarian Academy of Sciences, in the area of "World Economy and International Economic Relations" with dissertation topic: "Economic Effects of the Price of Crude Oil in International Trade." In 2010 she defended PhD degree before the relevant Specialized Scientific Council at the Higher Attestation Commission.

From 2010 to the present, Prof. Zhelyazkova teaches at VUZF, initially as a non-habilitated lecturer in various disciplines in the field of finance (2010-2013), and then as an associate professor (2013-2018) and professor (2018 - so far). From 2013 to the present, she holds the position of Vice-Rector for Academic Affairs and Quality Management of the university. For the last three years she has been the director of the Finance and Financial Management Department at the Laboratory for Applied Research of VUZF (VUZF Lab).

In her capacity as Director of Finance and Financial Management at VUZF Lab, Prof. Zhelyazkova initiated the formation and headed the Working Group on Circular Economy and Sustainable Finance. Both scientists from the country and three internationally recognized researchers are involved in this group. As part of the activities of this group, Prof. Zhelyazkova successfully leads two research teams, whose work ends with the publication of collective volumes with scientific review, both on the topics of her dissertation: “Circular Economy and Sustainable Finance” and “Sustainability of the Financial System - Long-Term Prospects. (Ontological and Empirical Grounds)”.

Apart from that, over the years Prof. Zhelyazkova is a leader and participant in a total of 9 international and national educational and research projects. Specifically in connection with the topic of the dissertation, the management of a scientifically applied project commissioned by the Bulgarian Stock Exchange (BSE) on the attitudes of Bulgarian companies towards the new environmental requirements that are to come into force is impressive, and the satisfaction of the BSE management of the team should be highlighted, as can be seen from the submitted feedback from BSE management.

Prof. Zhelyazkova participates as a guest lecturer on the topic of her dissertation in various universities in the country and abroad - University of Economics-Varna, Aldo Moro University, Italy, University of Central Lancashire, University of Macedonia, Thessaloniki, Greece. In this way, she enriches her experience from the international academic environment, disseminates the results of her research and receives feedback and guidance from her fellow scientists on her research path.

In addition to these activities, Prof. Zhelyazkova performs review work as a reviewer of research projects, scientific papers and as a participant in scientific juries not only at VUZF, but also at leading universities in the country - University of National and World Economy - Sofia, Sofia University, "St. Kliment Ohridski", the University of Economics-Varna, the University of Plovdiv "P. Hilendarski", as well as in the Bulgarian Academy of Sciences.

Separately, over the years Prof. Zhelyazkova has participated as a chairwoman and as a member of organizational and scientific committees of scientific forums both in Bulgaria and abroad. All this experience in scientific activity develops her qualities as a scientist.

Prof. Zhelyazkova is a member of four editorial boards: that of VUZF, and three of international editions in English. She is also the supervisor of two successfully defended foreign doctoral students. These activities support the formation of critical research thinking in her, which contributes to the depth of her work.

The results of Prof. Zhelyazkova's research on topics related to the circular economy and environmental risks are directly applicable in the educational process at VUZF. This happens as she:

- leads the team at VUZF for the development, launch and teaching and learning process of the first in Bulgaria master's program dedicated to circular economy: "Circular Economy and Sustainable Management" with the support of the business organization Cleantech Bulgaria;
- Develops and teaches a new course "Circular Economics" in Bulgarian for undergraduate students;
- Develops and teaches a new course "Environmental and social risk in the investment process", in English and in Bulgarian, for graduate students.

In addition to academic experience, Prof. Zhelyazkova has extensive administrative experience in business - for the past 15 years (2006 - present) she has been working in one of the systemic banks in Bulgaria – Postbank Bulgaria, where for 7 years she has been responsible for the expenditure part of the budget, and from 2011 until now - for the environmental policy of the institution. Prior to that, she gained experience working in an international environment, working in the export department of Mercedes-Benz in Istanbul (2005-2006). Prof. Zhelyazkova's experience in the banking field contributes significantly to the development of the applied side of her research, as well as to the identification of the need for training and educational programs on the topic of the circular economy and the new risks for banks. She has the rare chance over the years to constantly test the results of her research directly in practice, which contributes to the development of her ideas.

In parallel with her academic and administrative work in higher education and in the banking field, Prof. Zhelyazkova has gained substantial experience in the field of public, as well as closely scientific, scientific-applied and expert activities. In the period 2013-2016 she performed the functions of National Contact Points for the Republic of Bulgaria on financial issues of the Horizon 2020 Program at the European Commission in Brussels. In the period

2013 - so far Prof. Zhelyazkova participates in various high-level expert groups: to the United Nations (UN), in particular to the UN Environmental Programme - Financial Initiative (UNEP FI), as well as to the European Commission in Brussels - Energy Efficiency Financial Institutions Group (EEFIG). These expert groups are tasked with creating and testing various methodologies for reporting on climate change and environmental risks on the banking sector. Prof. Zhelyazkova's participation in them for eight years played an important role in her formation as a scientist in her chosen field of research, and also gave her the opportunity to test her ideas and receive feedback on them from established international experts.

Over the years, Prof. Zhelyazkova has given a number of trainings to employees of public sector and business organizations - examples of such trainings are for the Agency for Promotion of Small and Medium Enterprises and for Postbank Bulgaria. During these trainings she has had the opportunity to receive information about the needs of knowledge and skills in the new areas of expertise, object of her dissertation.

Prof. Zhelyazkova actively participates in various media - television, print, online, giving expert interviews on the topic of her dissertation and other important issues for our country. In this way, her thoughts become available to the general public, and this is important for the dissemination of the results of her research.

Prof. Zhelyazkova speaks English, French, Russian and Greek and this significantly helps her to realize her research goals.

Conclusion on item 2: Prof. Zhelyazkova has developed as a scientist who has had the opportunity to combine and develop her research and practice, and then apply them successfully in business and in higher education.

3. Topicality of the topic and expediency of the set goals and tasks

The topic of the transition from a linear to a circular economy is gaining increasing relevance. This is due to the growing problems for economic actors arising from climate change and environmental challenges, which have led to a declaration of determination at international level to change the economic model so that the world can overcome them. The European Union (EU), of which our country is a part, has decided to announce the so-called "Green Deal", which launched active policies in all areas of economic and social life, so that by 2050 achieve climate neutrality. This will be done by taking the path of transformation of the existing linear into a circular economic model. Banks as the main source of credit resources are called to play a central role in this process. To meet the challenge, however, they need to develop and

implement methodologies to assess the various new risks that both they and their customers will face.

As it is completely new, the topic of the connection between the transition to a circular economy and the risks for banks is relatively poorly developed in the scientific literature in English, and in that in Bulgarian the work submitted for review is the first study of its kind. The candidate's approach is interesting - to start by presenting the basis on which new risks for banks are developing - climate change and environmental problems and the determination of a number of countries around the world to start efforts to change the familiar linear economic model, and then move on to the essence of the problem, object of work - the risks for the banks and their management. The interdisciplinary connection made with the accounting issues is also interesting, emphasizing the importance of accounting and reporting for the formation of indicators for the environmental performance of the companies-clients of the banks, so that the banks have the information necessary for their risk management.

Conclusions on item 3:

1. The topic of the dissertation - "Management of banking risks in the transition to a circular economy" is relevant for both theory and practice.
2. The goals, subject, object, hypotheses and tasks of the research are correctly and adequately formulated and reflect the idea of the candidate for the presentation of the chosen research problem.

4. Knowledge of the problem

The author of the dissertation knows the research problem very well and this is evident from the significant number of literature sources used - a total of 158 in different languages, the clarity of the exposition of the work, as well as the two reviews of the empirical part of the study received by representatives of the top management of the bank, in which this part has been tested for a year and a half. In the course of the exposition in a number of places the author makes critical analysis of the information she has gathered during her research, showing her opinion on the issues considered and the awareness of their specificity both in theoretical and in practical terms.

5. Research methodology

For the purposes of the realization of the tasks of the dissertation work Prof. Zhelyazkova applies a set of methods in the field of both qualitative and quantitative analysis. Thus, in the

first four chapters she uses the historical review, the literature review, the comparative critical analysis and synthesis and it is appropriate considering the peculiarities and purposes of this part of the exposition - to present in chronological order the origin and formation of the idea of the circular economy and to analyze the scientific literature on the subject, to present the experience of the leading countries in the implementation of the circular economy in the world, to analyze the state of accounting of the green economy, as well as the overall importance of the research through the eyes of banks.

In the fifth, last chapter, methods in the field of quantitative analysis are used, as in this part of the paper the results of the simulations of the model proposed by the applicant for environmental and social risk assessment in bank lending are presented. I believe that this approach is appropriate and helps to achieve the objectives of the study as defined in the introduction.

6. Characteristics and evaluation of the dissertation

The dissertation submitted for review consists of an introduction, five chapters, a conclusion, a list of references and appendices. I believe that the chosen structure of the exhibition is appropriate and adequate and provides very good opportunities to achieve the research goals. The overall impression is of a work with a markedly eclectic character - the author applies a set of approaches and conducts research in various fields of economic knowledge to characterize the specific object of her research - banking risks in the transition to a circular economy. The work is characterized by pronounced interdisciplinarity and innovation in the approach to the researched problem.

The introduction has an introductory character in the studied issues. Within its framework, the goal, tasks, object, subject and hypotheses of the research are clearly and consistently outlined. The candidate has defined two scientific hypotheses, namely that "... among the main problems before the transition to a circular economy can be outlined: 1) the way the financial system works. Banks, which are the main sources of financial resources, especially in Europe, continue to finance the linear economy and 2) the lack of standardization in the ways of accounting and tracking progress in this direction. Both hypotheses are properly motivated and developed within the introduction. The methodological tools are presented, explaining the choice of the author of the combination of quantitative and qualitative analysis in the study. The restrictive conditions of the study are correctly outlined.

The object of study in the first chapter are climate change as one of the most serious phenomena of modern times, its nature and manifestation. Consequently, based on a wealth of factual material from a variety of sources, the impact of climate change on economic agent is presented. The main directions in which these changes are manifested and their connection with the business environment are outlined. Emphasis is placed on the main problem related to climate change - the rate at which they occur and the exponential increase in the so-called extreme weather events over the past 20 years. The applicant has clearly defined the most immediate problem as a result of these changes - the significant increase in various types of costs for economic entities, which directly affects their financial results, and which forces them to seek non-standard solutions for future development. The exhibition then turns to presenting a taxonomy of financial risks and their relationship to climate change. Climate risks are defined and their manifestation is shown within the well-known, classic for financial theory risks - credit, market, operational, reputational, supply chain risk, legal, regulatory and others. The presentation of the taxonomy of these risks shows the very good awareness of the candidate both regarding the theory in this issue and the financial practice. Finally, in the third part of the first chapter, the candidate presents historically and analytically the global regulatory framework for combating climate change, thus showing the decisiveness to manage climate change at geopolitical level.

Logically, the exposition moves from the first to the second chapter, where the candidate presents and analyzes the genesis and etiology of the concept of "circular economy" and then - the practice in the face of the policies of some of the leading countries in this field. As part of the theoretical review in the first part of the second chapter, the candidate has analyzed a large number of literature sources. As a result, this part of the work presents a complete, concise analysis of how the idea of circular economy was born, who are the scientists and practitioners who contributed to its formation, what are the main theoretical approaches and concepts underlying and building on it, as well as what major scientific controversies it raises over time. Furthermore, based on various literature sources, the international perspectives of the circular economy are outlined, presenting and analyzing the practices of a number of countries - Japan, China, the EU as a whole and some leading countries in the application of policies towards circular economy - Germany, the Netherlands, France and Denmark. In this way, the circular economy is revealed not only as a theory, but also from practical point of view - historically and at the present time, which contributes to the illustration of the theory behind it in the economic life of the countries chosen by the author.

From the macroeconomic perspective of the issues presented in the first and second chapters, the exposition in the third chapter moves to the level of sectoral policies and practices. The focus of this chapter is first on banks and their role in the process of transition to a circular economy and, secondly, on capital markets. The author's motive is that these are the two main sources of attracted resources for economic entities, and it is rightly stated that the role of banks in Europe is significantly greater than that of the capital markets.

The fourth chapter presents the issues related to environmental accounting and reporting and the relationship of their development with the transition to a circular economy. Here the candidate examines the various existing international non-binding standards, as well as good practices for organizing environmental accounting. Further attention is paid to international practices in the field of environmental reporting. Analytically, the problems in the field of accounting theory and the main directions of the application in the accounting practice are outlined, based on publications of foreign authors. The treatment of this issue in Bulgaria is practically not affected.

The focus of the fifth chapter is the issue of monitoring the environmental and social risk in bank lending. The exposition begins with the presentation of the author's conceptual model of the essence of green banking and the idea of a green bank. The candidate offers her own interpretation of what it means for a bank to be "green" and defines four levels of development of the bank in this direction. This is the candidate's contribution, as the concept of a "green bank" is widespread in both scientific and popular science literature, but there is no clear definition of what exactly lies behind it.

Then, the stages of environmental and social risk management in corporate lending are analyzed according to good international banking practices, as well as according to the guidelines of the European Bank for Reconstruction and Development (EBRD). The main points of these stages, the difficulties and challenges for the management of the banks and for their employees in the implementation of the process are outlined. This part of the work shows the good knowledge of the practice on the part of the applicant and this can be explained given her many years of experience in the banking field in this area.

The results of the empirical research, which the candidate has performed as part of her research work on the topic of the dissertation, are presented after that. Within this part of the exposition a mathematical model for assessing the environmental and social risk in bank corporate lending is presented, which the author offers and which has been tested in one of the systemic banks in Bulgaria. This model is based on an upgrade of the EBRD's four-factor scoring card model. To

the standard four factors for environmental and social risk assessment - type of business activity, loan term, loan amount and type of collateral, the author has added four new ones - type of credit product, type of beneficiary (large, medium, small client) of the bank according to its internal classification), method of loan repayment, number of years of the client's activity in the bank. These four new factors complement and expand the scorecard and contribute to a more accurate and clearer assessment of the degree of environmental and social risk to which the bank is exposed. The two scorecards have been tested on a significant number of records - data on individual credit transactions - more than 15,000 per year, which ensures the reliability of the results of the simulations that have been performed. The results of the simulations show that when applying the upgraded scorecard on the data from the corporate loan portfolio, the share of transactions with high and medium environmental and social risk decreases compared to that when applying the standard scorecard of the EBRD. This is understandable, as the upgraded scorecard proposed by the author includes twice as many elements as that of the EBRD and this leads to a higher accuracy of the assessment. I believe that structuring this model within an alternative scorecard has a high practical value, especially in view of the latest regulations and guidelines of the European Banking Authority and the European Central Bank on the management of new risks, especially environmental and climate risks. This is the statement of two of the representatives of the top management of the bank, in which the model was tested - the Chief Operating Officer and the Chief Risk Officer - within the framework of special reviews on the qualities and benefits of this model.

It is valuable and facilitates the reader that each of the five chapters ends with conclusions. In this way the author draws attention to the accents of her work.

The conclusion correctly presents the main inferences of the overall study.

Conclusion under item 6: The dissertation has a clear structure that corresponds to the goals, object, subject and tasks set in it. This structure is consistent, but at the same time in itself represents an innovative approach to the research topic, characterized by pronounced eclecticism and interdisciplinarity - an approach that is becoming extremely relevant in modern research. The presentation is smooth, the analyzes in it are based on numerous literary sources in different languages, which shows the very good awareness of the candidate regarding the issues internationally. As a result of the research work carried out in the course of the presentation, the two hypotheses set forth in the introduction have been convincingly proven.

7. Contributions and significance of the development for science and practice

The candidate has identified a total of six contributions in her dissertation. I believe that they are correctly formulated and accurately reflect what has been achieved within the work. In my opinion, however, they could have been presented in more detail in order to more fully reflect the realized scientific and scientific-applied results.

First of all, a new scientific field related to the study of the role of banks in the transition from a linear to a circular economic model has been formulated and substantiated. The role of banks as a basic source of attracted resources for the world economy and their leading role for the realization of the transition from a linear to a circular economy is defined and systematized. However, banks are conservative institutions and the main task of their management is to manage the various types of risks that arise for them from the activities of their customers. What are the new risks they will face in the transition to a circular economy and how can these risks be managed? Prof. Zhelyazkova's dissertation offers answers to these two central questions, firstly, it presents a taxonomy of new risks and secondly, it offers a specific model for assessing the environmental and social risk in banks' loan portfolios.

Secondly, an innovative interdisciplinary approach has been applied to analyze the above new issues, and the success of banking risk management is related to the need to build clear and binding for all economic entities international standards for accounting and reporting the effects of activities of organizations on the environment and hence on climate. The existing practices and standards in this field are systematized and the main problems before compiling the environmental reporting are presented. The importance of environmental accounting for the success of the transition to a circular economy has been proven, because, as the applicant correctly points out, it is not possible to manage a process without it being tracked and measured, and the information about the performance of economic entities is generated mainly in their accounting departments.

Third, the author offers a new concept for the content of the concept of "green bank", systematizes the stages of its development and assesses the degree of development of their "green" business at which banks are at the moment. The interpretation of this concept is important because in the scientific literature, as well as in practice, there is more and more talk about "green banking" and "green banks", but there is no clarity about what exactly are the characteristics of these banks and this type of banking.

Fourth, in the context of analyzing the notion of a green bank and the stages of its development, existing international methodologies are presented, which prescribe rules for managing

environmental and social risks in banks - an activity that is invariably related to the notion of a green bank and is central to it. The critical analysis of the EBRD's widely used methodology in banking has a pronounced applied character, as it outlines the advantages and disadvantages for banks from its application.

Based on the conclusions of this analysis, in the fifth place, the author has proposed a new model of scorecard for environmental and social risk assessment and, which is the most valuable from an applied point of view, has tested it in a systemic bank in Bulgaria.

Last but not least, I consider as a theoretical contribution the clarification of the essence of the term "circular economy", the analysis of its etiology, the development over time of its connotations in various scientific and applied research of scientists and experts from around the world, and the presentation the experience of a number of leading countries in the transition to circular economy.

Conclusion under item 7: The dissertation work in its entirety and the specific contributions in it are important for science and practice and can be used in banks.

8. Evaluation of the publications on the dissertation

The candidate has presented a total of 15 scientific publications on the topic of her dissertation, of which 4 are in Bulgarian, 11 - in English. Their distribution by types is as follows: one chapter of a book by an international scientific team, one study, 12 scientific articles and one scientific report. Within these publications, the candidate has presented some of the conclusions that are embedded in her dissertation. Part of the publications present a theoretical overview of terminology related to the circular economy, another part discuss the applied aspects of environmental and social risk management in bank lending.

9. Assessment of compliance with the minimum national requirements

From the report submitted by Prof. Zhelyazkova on the implementation of the minimum national requirements set out in the Law on the Development of Academic Staff in the Republic of Bulgaria and the Regulations for its implementation, in connection with the present procedure, it is evident that she meets and exceeds these requirements. With a required minimum of 350 points, she has achieved a total of 585 points by all criteria.

10. Personal participation of the doctoral student

I believe that the dissertation submitted for review and the publications in connection with the topics discussed in it are the personal work of the candidate. At the time of writing, there is no evidence of plagiarism in these works. The requirements of Art. 29, para. 6 of the Law on the Development of Academic Staff in the Republic of Bulgaria are fulfilled.

11. Abstract

The abstract presented for review correctly reflects in a concise form the essence and the main contributions and conclusions in the dissertation. It meets the requirements for the preparation of such a work and contains a list of scientific publications on the topic of the dissertation, as well as a reference to the contributions in it.

12. Critical remarks and recommendations

I would like to recommend Prof. Zhelyazkova to continue and deepen the study of the problems related to environmental accounting and reporting and the connection of their development with the transition to the circular economy, both in the field of accounting theory and the main directions of cases in accounting practice. It is noteworthy that the candidate is well acquainted with this matter and the relevant publications of foreign authors, but the study of the issue in Bulgarian theory and practice is not reflected in her work. This is an area that I recommend to be further developed in the author's future research.

13. Personal impressions

Prof. Zhelyazkova is a scientist and professional practitioner who works on current problem areas and aspects of still limited research at the national level, namely the financial dimensions of climate and environmental change, as well as the circular economy and their manifestation in banks. The candidate has built her own, at the same time emphatically modern style of writing. Personally, for me Prof. Zhelyazkova is a respected and deeply ethical colleague and an established professional, clearly recognizable in academia with an excellent reputation.

14. Recommendations for future use of dissertation contributions and results

I would like to recommend the candidate to start approbating the contributions with scientific-applied and applied significance.

CONCLUSION

As a result of my acquaintance with the dissertation, abstract and the scientific publications of the candidate attached for the purposes of this procedure, I am convinced that they contain scientific, scientific-applied and applied results that represent an original contribution to science and meet all requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria and the Regulations for its implementation.

Based on the above, I give my positive assessment of the research presented by the above peer-reviewed dissertation, abstract, results and contributions, and I invite the esteemed scientific jury to award the degree of "Doctor of Science" to Prof. Dr. Virginia Ivanova Zhelyazkova in the field of higher education 3. Social, economic and legal sciences; Professional field 3. 8. Economics; doctoral program "Finance, Insurance and Insurance" at VUZF Unviersity.

April 11, 2021.

Reviewer:

(Prof. Daniela Feschiyan, PhD)