OPINION

by Associate Professor Dr. Gergana Valcheva Taneva-Angelova, University of Plovdiv

of the materials submitted for participation in the competition of dissertation for the award of the educational and scientific degree *Doctor*

by field of higher education **3. Social, Economic and Legal sciences**

Professional field **3.8 Economics**

Doctoral Program: **Finance and Accounting**

Author: **Todor Slavchev Anev**

Title: ***Financial and Economic Effects of Stimulating Climate-Neutral Growth.***

Scientific Supervisor: **Prof. Dr. Stanimir Ivanov Kabaivanov, University of Plovdiv "*Paisii Hilendarski*", Department of *Finance and Accounting*.**

1. General Presentation of the Procedure and the PhD student

By Order No. RD-21-2369/19.12.2024 of the Rector of the University of Plovdiv "Paisii Hilendarski" I have been appointed as a member of the scientific jury for the defense procedure of the dissertation ***Financial and economic effects of stimulating climate-neutral growth*** for the award of the degree *Doctor*. The author of the dissertation is a full-time PhD student Todor Slavchev Anev in the *Faculty of Economic and Social Sciences* at the *Department of Finance and Accounting*.

The materials submitted by the PhD student in electronic format comply with Article 36 (1) of the Academic Staff of Plovdiv University *Paisii Hilendarski*. The set of materials includes the following key documents: *1. Application to the Rector for initiation the dissertation defense procedure; 2. Curriculum vitae in European format; 3. Opinion of the scientific supervisor; 4. Dissertation 5. Abstract in Bulgarian and English 5. Declaration of originality and authenticity of the submitted documents 6. List of publications related to the dissertation; 7. Compliance report with the minimum national requirements (prepared by the candidate).*

The PhD student has attached three publications related to the dissertation topic, published 2022-2023. All materials align with the professional field and comply with Article 36 of the Academic Staff Development Regulation of the University of Plovdiv. The compliance report and supporting materials confirm that the candidate meets the necessary requirements for the degree.

2. Relevance of the topic

The dissertation topic is highly relevant in the context of global efforts toward sustainable development and the commitments under the Green Deal and examines the financial and economic dimensions of the transition to climate-neutral growth. In this regard, the study is of great significance for national economies. The research requires innovative approaches to harmonize economic efficiency and sustainability. The analysis of environmental, economic and financial aspects of climate-neutral growth provides a basis for strategic decision-making at both state and corporate levels.

2. Understanding of the Problem

The PhD student demonstrates a deep understanding of the problem, integrating various statistical and econometric approaches to support the main thesis. The analysis covers both theoretical concepts and practical aspects of the economic effects of environmental policies. The PhD student has systematically reviewed existing scientific research related to statistical and econometric methods and models and has presented knowledge on institutional documents, such as the Paris Agreement and the European Green Deal.

3. Research Methodology

The dissertation presents a methodology combining quantitative analysis, mathematical modeling, and statistical methods. The research design (p. 56) is well-structured, logically sequenced, and precise. The PhD student aims to derive quantitative relationships between economic, financial and environmental indicators, developing models to assess the impact of environmental policies on the economy. The study includes:

- simulations and optimization to predict economic effects of climate-neutral growth,
- regression analysis to determine statistically significant relationships between variables, such as greenhouse gas emissions and financial indicators,
- evaluation of dependencies, both at micro and macroeconomic level by sectoral breakdown.

The econometric methods applied include: ARIMA, *Ridge Regression* for time series modeling, *Monte Carlo* simulations to assess the variation of stochastic variables and examine stationary distributions and mathematical modeling and linear optimization to define the optimal structure of the national economy under emission constraints. The research uses economic, financial, and environmental data, processed mainly with R software. The candidate also applies stationarity analysis (ADF test) and interprets the derived relationships.

5. Evaluation of the Dissertation and Its Contributions

The methodology integrates economic and financial analyses, and this combination of regression models and simulations provides statistically significant results with practical applications. The dissertation’s contributions are evident in the applicability of its results for both national institutions and the private sector. Key contributions include quantitative relationship between value added and environmental indicators across industries, modeling of financial effects from regulatory constraints on greenhouse gas emissions, recommendations for financial instruments, such as green bonds, for financing sustainable energy projects and carbon emission reductions, proposals for financial incentives, for example tax reliefs for companies investing in environmental innovations, tools for assessing the economic effects of environmental policies to inform sustainable development strategies, and optimization models applicable to various industries to support climate-neutral growth.

There are some linguistic and technical aspects in this dissertation that could be improved to enhance clarity and readability:

- In some parts of the text, incorrect or missing punctuation makes it harder to read and understand the content.
- Many sentences are either unclear or unnecessarily complicated, making it difficult to grasp the presented ideas.
- The text lacks uniform formatting, which affects the overall structure of the dissertation. For example, on page 8, the phrase *Scientific research in the field* is a verbless construction, giving the impression of a subheading, even though it is not numbered as such.
- There are errors in the use of definite and indefinite articles, affecting the correct syntactic structure of sentences.
- Some terms used in the dissertation are inaccurate or uncommon in academic writing. For example, *reference person* is used incorrectly in the context of CDS (Credit Default Swaps), where the standard term in Bulgarian is *reference institution* or *reference debtor*. Similarly, the term *confidential interval* on page 67 is incorrect; the correct term in Bulgarian financial literature is *confidence interval*. Additionally, the dissertation introduces non-standard abbreviations and terminology that do not align with established financial literature. For instance, alternative names are used for CDS, synthetic CDOs, and other financial instruments.
- Throughout the text, certain sentences are unclear or too lengthy. For example, the sentence "*The total amount of nominal value for which it can be sold upon the occurrence of a credit event is called the 'notional principal of the credit default swap*" likely intends to convey that: the notional principal of a CDS represents the maximum amount the buyer of the financial instrument can receive if a credit event occurs. Another example is on page 52, where the sentence: "*Debt-backed liabilities are instruments where the collateral is bonds*." could be more clearly stated as debt-backed liabilities are financial instruments secured by bonds.

In conclusion, the dissertation is well-founded, relevant, and offers significant practical and applied contributions. However, the text is affected by overly complex expressions, lengthy sentences, unclear terminology, as well as stylistic and punctuation errors, which impact its readability and clarity.

6. Assessment of Publications and Personal Contribution

The PhD student has published several scientific articles related to the dissertation topic, demonstrating the ability to analyze and summarize complex problems. The personal contribution is evident in the application of econometric models to examine environmental and financial effects. The quality of the publications confirms the scientific value of the research.

7. Abstract

The abstract has a volume of 34 pages and meets the requirements of the Law on the Development of the Academic Staff in Bulgaria. It correctly reflects the dissertation's content and provides a comprehensive overview of the main findings.

8. Recommendations for Future Applications of Dissertation Findings

The quantitative relationships derived between added value and environmental indicators can serve as a foundation for national authorities in designing sustainable development policies. Models assessing the financial effects of regulatory restrictions on greenhouse gases can support the creation of economic incentives for businesses adopting eco-innovations. Additionally, financial instruments for climate-neutral growth can be tailored to different sectors, including energy, transport, and agriculture. For future research, the methodology could be expanded by incorporating additional variables or conducting international comparisons, which would enrich the analysis and enhance its applicability. The author's methodological approach employs a diverse range of analytical methods and models, but broader international comparisons would help validate the findings. Furthermore, if the PhD student continues this research, they could explore nonlinear dependencies using neural networks (LSTM, GRU) and apply machine learning models such as XGBoost to improve the prediction of the economic effects of environmental policies.

CONCLUSION

The dissertation of Todor Anev is methodologically well-founded, highly relevant, and, despite the remarks noted, meets academic standards. It is a comprehensive and meaningful study with significant contributions. Despite the identified shortcomings, I recommend that the scientific jury award Todor Anev the educational and scientific degree of *Doctor*.

05.01. 2025 **He has prepared the opinion..................**

(signed)

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(*ak. dl., n. st., name, surname*)