

REVIEW

of a PhD thesis entitled "Financial Aspects of the Transition to a Circular Economy" by PhD candidate Nikolay Vasilev Todorov, PhD No. D010221235, Department of Finance and Credit, D. A. Tsenov Academy of Economics

Prepared by Prof. Stoyan Prodanov, PhD

Scientific specialty 05.02.05 "Finance, Monetary Circulation, Credit and Insurance", registered in NACID on 01.12.2018

Form of doctoral studies: Full-time PhD candidate

Leading department: Department of Finance and Credit, Faculty of Finance

Scientific supervisor: Prof. Stefan Simeonov, DSc

Doctoral programme: "Finance, Monetary Circulation, Credit and Insurance" (Finance)

Dear colleagues,

The topic of the dissertation of PhD candidate Nikolay Vasilev Todorov is "Financial Aspects of the Transition to a Circular Economy". The review has been prepared in accordance with the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, its implementing regulations, and the internal regulations of the D. A. Tsenov Academy of Economics.

1. General information about the PhD candidate

PhD candidate Nikolay Vasilev Todorov has been enrolled in the doctoral programme at the Department of Finance and Credit at the D. A. Tsenov Academy of Economics, in the scientific specialty "Finance, Monetary Circulation, Credit and Insurance (Finance)". His education as a Master of Economics from the D. A. Tsenov Academy of Economics, combined with his current doctoral training in finance, provides a solid theoretical foundation which, together with his extensive practical experience, ensures a high degree of applicability and realism of the

research results.

Nikolay Todorov is an economist with long-standing practical experience in public finance, local governance and tax control, which significantly enhances the scientific value of the dissertation. Professionally, he has been actively involved in local governance as a municipal councillor in the Municipality of Troyan, including experience as Chairman of the Municipal Council, where he has participated in the development and updating of local regulations, strategic documents and policies. In parallel, he has substantial experience in the tax administration as a tax inspector at the National Revenue Agency, which provides him with in-depth knowledge of fiscal mechanisms, control and accountability in the public sector.

His professional activity also includes managing a private business and active participation in the civil sector as a project manager and expert in circular economy, where he develops and implements initiatives related to sustainable development, environmental policies and public participation. His involvement in the drafting of officially adopted нормативни acts and institutional analyses in the field of waste management and green systems at the municipal level represents particularly valuable practical experience, directly reflected in the dissertation.

2. General presentation of the dissertation, assessment of its format and structure

The dissertation comprises 383 pages, of which 353 pages constitute the main body of the text, appendices and bibliography, and is prepared in accordance with good academic practices and the нормативни requirements for a doctoral dissertation. It is structured into an introduction, three chapters, a conclusion, bibliography and appendices, following the classical academic model. Each chapter is clearly defined and contributes to achieving the overall objective of the study. The structure ensures a good balance between theoretical foundations, empirical analysis and practical recommendations.

The bibliography includes a significant number of Bulgarian and international sources, нормативни documents, EU strategic frameworks and reports of international organisations. It contains 169 sources, including нормативни acts, strategic documents, academic literature and publications indexed in reputable international databases. Citation is carried out correctly in APA style, with consistency between in-text references and the bibliography. The dissertation includes 31 figures and 40 tables. The conclusion summarises the main findings, highlights the scientific and applied contributions, and formulates recommendations for institutional practice and future research. A declaration of originality is included.

3. Scientific and substantive assessment of the research

The dissertation addresses one of the most relevant and strategically significant topics in contemporary economic science – the financial aspects of the transition to a circular economy, with a focus on its applicability at the municipal level. The research problem is positioned within the context of European policies for sustainable development, the Green Deal and the need to transform the linear “take-make-dispose” model into a resource-efficient, low-carbon and regenerative economic model.

The object of the research comprises circular economy models related to key municipal activities, while the subject encompasses the нормативни, administrative and financial-economic mechanisms through which circular economy principles can be implemented and institutionalised at the local level. This distinction is clearly defined and allows a focused analysis on the financial dimension of the process.

The main research thesis is that the implementation of circular economy mechanisms at municipal level is not only environmentally and socially justified, but also economically efficient, provided that an integrated managerial and financial model is established.

The research objective – to identify applicable circular economy models and

develop scientifically grounded financial instruments for their implementation in Bulgarian municipalities – is logically linked to the research tasks and hypotheses. The tasks progress from theoretical and historical analysis, through comparative review of international practices (including the Japanese model), to the development and testing of specific financial instruments, notably a new methodology for determining municipal waste fees based on circular economy principles.

The methodological framework is robust and includes comparative and system analysis, induction and deduction, cost-benefit analysis (CBA), scenario analysis, sensitivity analysis, and calculation of key financial indicators such as NPV, IRR, BCR and Payback Period. The inclusion of SROI extends the traditional financial framework by incorporating social impact assessment.

The empirical part, focused on the Municipality of Troyan, constitutes a significant contribution. Through the development of three scenarios for the period 2025–2035 and the analysis of discounted cash flows, the author demonstrates the economic viability of the proposed model. The analysis includes risk assessment, sensitivity analysis and alignment with European and national policy frameworks.

The research demonstrates consistency, analytical depth and critical thinking. The author goes beyond descriptive analysis and proposes concrete managerial and financial solutions adapted to the Bulgarian institutional environment.

4. Content of the dissertation

The dissertation “Financial Aspects of the Transition to a Circular Economy” is structured into an introduction, three logically interconnected chapters, a conclusion, bibliography, and appendices. The internal composition of the study follows a clear scientific logic – from the conceptual and regulatory understanding of the circular economy, through the development of financial and managerial models, to their empirical validation at the municipal level.

In the introduction, the author substantiates the relevance of the topic in the context of global resource constraints, climate challenges, and the need to transform the existing linear model of economic development. The object and subject of the research, the research thesis, the aim and specific tasks, as well as the working hypotheses guiding the overall logic of the study, are clearly formulated. At this stage, it is explicitly stated that the focus is on the financial and economic dimensions of the transition to a circular economy and on the possibilities for their institutionalisation at the local level.

Chapter One is devoted to the theoretical foundations, regulatory framework, and current state of the circular economy. It presents a historical overview of the emergence and development of the concept, from early ideas about economic equilibrium and resource limitations to contemporary interpretations of the circular economy as a systemic model of sustainable growth. The chapter examines theoretical foundations, including the economics of efficiency, industrial ecology, and concepts of material and energy flows. Special attention is paid to the legislative framework of the European Union and the role of the circular economy within the Multiannual Financial Framework 2021–2027, as well as to the degree of implementation of circular principles in national and local legislation. Thus, Chapter One establishes the theoretical and regulatory foundation of the study and identifies the key problem areas requiring financial and managerial solutions.

Chapter Two focuses on the development of new models based on the principles of the circular economy. It has a clearly expressed analytical and constructive character. Initially, the Japanese model of transition to a circular economy is examined, including the normative and fiscal instruments through which it has been institutionalised. The author derives lessons and opportunities for adaptation to the Bulgarian context. Subsequent sections explore the social dimensions of the circular economy within the concept of “Society 5.0”, including the role of information technologies, blockchain, and digital platforms for resource traceability. A significant emphasis is placed on the development of a model for

circular urban agriculture, viewed as a tool for integrating environmental, social, and economic objectives within the urban environment. A central element of Chapter Two is the financial model for a new methodology for determining municipal waste fees in the context of the circular economy. The author analyses the existing regulatory framework, proposes a new model for fee administration, and outlines financing mechanisms for waste management activities under conditions of transition to separate collection and resource efficiency. In this way, Chapter Two serves as a bridge between theoretical foundations and concrete financial solutions.

Chapter Three has an empirical and applied character and presents the validation of the proposed models at the municipal level, focusing on the Municipality of Troyan. Initially, the causes of environmental regulatory breaches and the factors hindering the implementation of the circular model in the region are analysed. A classification of these factors is made according to economic, social, and territorial criteria. The main emphasis is placed on the cost-benefit analysis (CBA) of introducing the new methodology for municipal waste fees and mandatory separate waste collection for the period 2025–2035. The author calculates discounted cash flows, net present value (NPV), internal rate of return (IRR), benefit-cost ratio (BCR), and payback period, developing three scenarios of implementation. A sensitivity analysis is conducted with respect to the discount rate and key parameters, as well as an assessment of social return on investment (SROI). Additionally, a survey is conducted among the population regarding attitudes towards separate waste collection and local environmental policies, complementing the financial analysis with behavioural and social dimensions.

The conclusion summarises the main findings, confirms or rejects the research hypotheses, and formulates recommendations for improving the regulatory and financial framework of the circular economy at the municipal level. The appendices contain нормативни references, models, and additional calculations that enhance the transparency and verifiability of the analysis. Overall, the dissertation demonstrates consistency, logical coherence, and

methodological robustness.

5. Scientific and Applied Contributions of the Dissertation

The dissertation contains substantial scientific and applied contributions that can be systematised in theoretical, methodological, and practical terms. These contributions are a logical outcome of the research thesis and the structured development of the analysis across the three chapters.

First, a significant scientific contribution is the systematisation and further development of the conceptual framework of the circular economy through the perspective of public finance. The author does not treat the circular economy merely as an environmental or industrial concept, but positions it as a financial-economic model requiring adequate fiscal instruments, budgetary mechanisms, and sustainable cash flows.

Second, a key contribution is the development of an integrated financial model for determining municipal waste fees based on circular economy principles. The model builds upon the existing regulatory framework and introduces a methodology aimed at encouraging separate waste collection, reducing mixed waste, and creating economic incentives for resource efficiency.

Third, the application of financial and investment indicators such as net present value (NPV), internal rate of return (IRR), benefit-cost ratio (BCR), payback period, and social return on investment (SROI) in the evaluation of municipal environmental policies represents an important methodological contribution. Through the cost-benefit analysis over the 2025–2035 horizon, the study demonstrates the financial sustainability and economic viability of the circular model.

Fourth, the dissertation contributes through the adaptation of elements of the Japanese circular economy model to the Bulgarian institutional environment. The author identifies fiscal and regulatory mechanisms that can be transferred and applied under local conditions.

Fifth, an important applied contribution is the empirical validation of an integrated circular model in a specific municipal context (Municipality of Troyan).

The combination of financial analysis, risk assessment, sensitivity analysis, and survey research provides a comprehensive view of the economic, social, and institutional applicability of the model.

Sixth, the integration of the social dimension through SROI and the analysis of public attitudes towards separate waste collection expands the financial evaluation beyond traditional investment criteria.

Thus, the scientific and applied contributions of the dissertation can be formulated as: conceptual understanding of the circular economy as a financial and economic model; development of an applicable fiscal instrument for the municipal level; methodological enrichment through the use of investment analysis in the public sector; empirical verification of the economic viability of circular policies; and adaptation of international experience to the Bulgarian institutional environment.

6. Assessment of the Publications Related to the Dissertation

The PhD candidate has presented publications directly related to the dissertation topic, reflecting the main research results. The publications are thematically consistent with the issues of circular economy, financial mechanisms of transition, and their application at the municipal level.

The candidate is the author of seven publications, including four articles and three conference papers, all of which are single-authored.

In terms of content, the publications demonstrate consistency in the author's scientific work, clearly formulated research questions, and well-argued conclusions. Some of the publications develop specific aspects of the financial model for municipal waste fees and the cost-benefit analysis, indicating a gradual dissemination and validation of the research results. The overall assessment is positive.

7. Assessment of the Abstract

The abstract accurately and concisely presents the required elements of the dissertation, including its relevance, object, subject, research thesis, objectives,

methodology, structure, and results. The scientific and applied contributions are clearly formulated, and the publications are presented in accordance with regulatory requirements. The abstract adequately reflects the dissertation and fulfils its purpose.

8. Critical Remarks, Recommendations, and Questions

I have no fundamental critical remarks and recommendations. Despite the high scientific level of the work, several recommendations can be made:

- The comparative analysis could be expanded to include more Bulgarian municipalities in order to increase the generalizability of the results.

- Further development of the analysis of macroeconomic risks would enrich the financial sustainability of the model.

But this does not reduce the positive overall assessment of the dissertation. I would like to ask the following questions to the doctoral student:

1. Considering the developed financial model for determining the municipal waste fee, how do you assess the risk of social unacceptability of differentiated charging and what mechanisms would you propose to achieve a balance between economic efficiency and social justice?

2. In view of the proposed integration between regulatory, financial and institutional mechanisms, what are the critical factors for coordination between local and central government, without which the implementation of the circular economy would remain fragmented and ineffective?

9. General Conclusion and Evaluation

The presented dissertation for the award of the educational and scientific degree "Doctor" possesses the required quantitative and qualitative characteristics and is well structured and supported by analyses and conclusions. The dissertation represents an independent, in-depth, and scientifically grounded study with clearly defined objectives, appropriate methodology, and significant applied results. It combines theoretical reasoning with empirical validation and

offers practical financial solutions for the transition to a circular economy at the municipal level.

My overall evaluation is positive. The dissertation meets the requirements of the Law on the Development of Academic Staff and its implementing regulations. This provides sufficient grounds to recommend that the scientific jury vote positively for awarding the educational and scientific degree the degree “Doctor of Philosophy (PhD)” to Nikolay Vasilev Todorov in the field of higher education 3. Social, Economic and Legal Sciences, professional field 3.8 Economics, scientific specialty “Finance, Monetary Circulation, Credit and Insurance (Finance)”.

31 March 2026

Reviewer:

/Prof. Stoyan Prodanov/