REVIEW

of a dissertation submitted for the award of the educational and scientific degree of **"Doctor"** in: field of higher education 3.0 Social, Economic and Legal Sciences, professional field 3.8 Economics, doctoral programme "Economics and Management (Agriculture)"

Author of the dissertation: **Hristo Vangelov Kostov,** full-time doctoral student at the Department of Economics, Agricultural University - Plovdiv

Title of the dissertation: **The Role of Bank Lending in the Sustainable Development of Agriculture**

Reviewer: **Assoc. Prof. Radosveta Yordanova Krasteva-Hristova, PhD,** D. A. Tsenov Academy of Economics - Svishtov, Department of Accounting, field of higher education: 3. Social, Economic and Legal Sciences; professional field: 3.8 Economics; scientific specialty "Accounting, Control and Analysis of Economic Activity (Accounting)", appointed as a member of the Scientific Jury by Order No. RD-16-737/08.06.2026 of the Rector of the Agricultural University.

1. Brief Presentation of the Candidate.

Hristo Vangelov Kostov has a consistently developed background in economics and substantial practical experience directly related to the subject of the dissertation. He graduated from the D. A. Tsenov Academy of Economics - Svishtov, where he obtained a Bachelor's degree in Industrial Economics and a Master's degree in Industrial Management. He additionally acquired the professional qualification of teacher of economics at St. Cyril and St. Methodius University of Veliko Tarnovo.

His professional development during the period 2004-2022 encompassed different levels of banking practice - retail customer service, lending to individuals, sales coordination, small-business banking, and the management of relationships with corporate clients. The positions he held at Societe Generale Expressbank AD, Piraeus Bank Bulgaria AD, and DSK Bank AD involved the preparation and evaluation of credit proposals, the negotiation of financial terms, and the completion of lending transactions. Since 2022, he has worked as a teacher of economics-related subjects. This combination of banking and pedagogical expertise is an important prerequisite for understanding the research problem both from the perspective of the financial intermediary and from the standpoint of economic theory and agricultural-sector practice.

The submitted dissertation is the result of independent research in which the doctoral candidate's personal professional experience has been transformed into a basis for scientifically grounded analysis. The choice of topic is logical and demonstrates an ability to formulate and address a significant economic problem with a clearly expressed practical orientation.

2. Relevance of the Research Problem.

The topic of the role of bank lending in the sustainable development of agriculture is unquestionably relevant. The agricultural sector is both strategic for food security and particularly vulnerable to climatic, price, market, and biological risks. The transition towards resource-efficient, technologically modernised, and environmentally responsible agriculture requires substantial long-term financial resources, and bank credit remains one of the principal channels through which such resources are provided.

The scientific significance of the problem arises from the need to consider credit not only as a source of liquidity and investment resources, but also as an instrument that may support or hinder the achievement of economic, social, and environmental outcomes. Particularly valuable is the author's attempt to determine whether increased lending activity is automatically transformed into balanced sustainability or whether its effect is heterogeneous and dependent on the institutional environment. In this way, the dissertation contributes to the contemporary debate on sustainable banking, green finance, and the adaptation of financial products to the specific characteristics of agricultural holdings.

The relevance of the study is further strengthened by the selected national context. Integrated empirical studies comparing the dynamics of agricultural lending with measurable economic, social, and environmental indicators remain relatively limited in Bulgarian academic literature. The dissertation responds to this need and has the potential to support decision-making by banks, agricultural producers, and public institutions.

3. Aim, Objectives, Hypotheses, and Research Methods.

The object of the research is the process of bank lending and its manifestation in Bulgaria's agricultural sector, while its subject is the role of bank credit as a factor in sustainable development, assessed through its impact on the economic, social, and environmental dimensions of sustainability. The principal aim is clearly formulated: to investigate and assess the role of bank credit in the sustainable development of agriculture by analysing lending mechanisms, their impact on the agricultural sector, and the possibilities for integrating sustainability principles into credit policy.

To achieve this aim, seven interrelated objectives are set: theoretical clarification of credit and sustainable development; identification of the specific characteristics of agriculture as an object of lending; analysis of the dynamics and structure of agricultural loans; empirical assessment of their influence on key indicators; structural analysis of employment; and formulation of recommendations. The relationship between the aim, the objectives, and the structure of the dissertation is logical and consistent.

The research thesis is that bank credit is a key, but not self-sufficient, instrument for the sustainable development of agriculture, and that its impact is multidimensional and heterogeneous. The thesis is specified through four hypotheses: a positive effect on investment in tangible fixed assets; an effect on employment; an effect on environmental pressure measured through animal and plant waste; and a positive effect on the average wage.

The methodological framework is appropriate to the stated objectives and includes theoretical analysis and synthesis, comparative, descriptive, and structural analysis, calculation of the Agricultural Orientation Index, Pearson correlation analysis, and four single-factor OLS regression models. The information base consists of official data from the Bulgarian National Bank, the National Statistical Institute, Eurostat, and the FAO. The main period for testing the hypotheses is 2009-2023, comprising 15 annual observations, while the period 2000-2022 is used for the international comparison and preliminary analysis.

A positive assessment is warranted for the model diagnostics applied through the Durbin-Watson and Breusch-Godfrey tests for autocorrelation, the Augmented Dickey-Fuller test for stationarity, and re-estimation using first differences. The author correctly acknowledges the risk of spurious regressions in upward-trending time series and limits causal interpretations. This methodological caution increases the reliability of the conclusions.

4. Visualisation and Presentation of the Results.

The dissertation has a total length of 215 pages and is structured into an introduction, three chapters, a conclusion, and a list of references. The research is illustrated with 33 tables and 19 figures. These do not serve merely an illustrative function, but systematise theoretical propositions, methodological decisions, and empirical results.

Particularly useful are the hierarchical structure of agricultural sustainability, the comparison of international indicator systems, the conceptual model of the relationship between credit and sustainable development, and the scheme of the methodological design. In the empirical chapter, the dynamics and structure of loans are presented by size and type, while the regression models are summarised through comparable indicators of correlation, determination, significance, and diagnostic testing. The hypothesis-verification table and the recommendation matrix establish a clear link between the results and the proposed managerial solutions.

The exposition is logical and easy to follow. The results obtained are interpreted in economic terms rather than being reduced to a mechanical presentation of statistical coefficients. The author distinguishes between statistical association and causality and demonstrates awareness of the limitations of time-series data. From a technical perspective, there are some inconsistencies in table numbering and several editorial omissions that do not affect the substantive quality of the dissertation, but should be corrected in its final version.

5. Discussion of the Results and Literature Used.

The empirical analysis reveals a differentiated impact of bank lending. With regard to the economic dimension, a positive and statistically significant relationship is established between loans and investment in tangible fixed assets ($R^2 = 0.628$; $p = 0.0004$). The result supports the understanding of credit as a factor in modernisation and capital renewal, while also showing that investment activity is influenced by subsidies, own funds, and market conditions.

In the social dimension, the results are mixed. No statistically significant effect is established on the number of employees ($R^2 = 0.063$; $p = 0.367$), which is explained by increasing capital intensity, demographic processes, and the substitution of low-skilled labour. At the same time, a strong positive relationship with the average wage is identified. The author's qualification that the high explanatory power in levels is affected by a common time trend, inflation, and the statutory increase in the minimum wage is important. Testing with first differences preserves the significance of the relationship, but in a considerably more moderate form.

In the environmental dimension, no statistically significant relationship is demonstrated between lending and the generated animal and plant waste ($R^2 = 0.080$; $p = 0.307$). This result is interpreted in a balanced manner: credit in itself neither guarantees improvement nor causes a systematic deterioration in environmental indicators. Bank products need to be specifically oriented towards environmentally responsible technologies and measurable sustainability outcomes.

A significant result is the identified asymmetry among the three dimensions of sustainability. Bank credit has its clearest manifestation in investment activity and income, but a limited direct effect on employment and environmental pressure. This conclusion is theoretically and practically significant because it rejects the simplified assumption that an increase in financial resources automatically leads to balanced sustainability.

The literature used comprises 142 sources - classical works on credit theory, Bulgarian and international studies in agricultural finance and sustainability, legislation, reports, and statistical sources. The literature review demonstrates broad awareness of the field and provides the necessary theoretical foundation.

6. Contributions of the Dissertation.

The contributions are logically related to the aim, the research thesis, and the empirical results. I consider them genuine and substantiated within the subject and information scope of the research.

Scientific Contributions

• The theoretical propositions concerning bank credit have been systematised and further developed, and an original definition has been proposed that combines the principles of repayment, maturity, remuneration, and trust with the redistributive function and an orientation towards sustainable economic development.

• An integrated conceptual and analytical framework has been developed for assessing the role of bank lending, combining the economic, social, and environmental dimensions of agricultural sustainability.

• A system of indicators has been proposed and operationalised, combining lending activity, the Agricultural Orientation Index, investment in fixed assets, employment, income, educational and age structure, and environmental pressure.

• The asymmetric nature of the impact of bank credit has been established empirically: a significant relationship with investment activity and labour income, and the absence of a statistically significant direct relationship with employment and waste. The conclusion has been tested through diagnostic procedures and regressions using first differences.

- The relationship between lending activity and the qualitative characteristics of human capital has been revealed - an increase in educational attainment accompanied by ageing and a decline in the share of young employees, which complements the assessment of social sustainability.

Scientific and Applied Contributions

- A practically applicable approach to the analysis of agricultural lending has been developed, which can be used by banks, public institutions, and researchers when assessing financial support in relation to the sector's economic contribution.
- A substantiated system of recommendations has been formulated for banking institutions concerning specialised investment products, seasonally adjusted repayment schedules, improved scoring models, and the integration of environmental and social criteria into credit assessment.
- Practical guidelines have been proposed for agricultural producers regarding the allocation of credit resources to long-term investment, their combination with public funding, the improvement of financial literacy, and the attraction of young professionals.
- A matrix of recommendations for public authorities and regulators has been developed, including the expansion of guarantee mechanisms, the linking of credit support to environmental standards, and the establishment of a national system of sustainability indicators.

7. Critical Comments and Questions.

The critical comments do not diminish my positive assessment, but identify opportunities for further development of the research. First, the limited number of observations, the use of aggregated national data, and the single-factor models do not allow the effect of credit to be isolated from subsidies, interest rates, inflation, climatic conditions, and structural differences among agricultural holdings. The author correctly acknowledges these limitations, but future research using panel microeconomic data and deflated values would allow a more reliable causal interpretation.

Second, the environmental dimension is represented mainly through the quantity of animal and plant waste. The indicator is relevant, but relatively narrow. Expanding the analysis with data on greenhouse-gas emissions, water and energy consumption, fertiliser and pesticide use, soil condition, and biodiversity would increase the comprehensiveness of the assessment.

I would like to pose the following questions to the doctoral candidate:

- The recommendations to the banking sector (Section 3.5.1) outline a fundamental direction - the integration of environmental criteria into credit assessment. How would you transform the proposal for "green" agricultural lending into a specific banking product? Which measurable environmental and social criteria, contractual terms, and incentives would you include when granting the loan and subsequently monitoring it?

• Who is the specific addressee that would implement the dissertation's recommendations in actual banking practice in Bulgaria? Which department or unit within a bank should initiate the proposed changes, such as the criteria for "green" lending or the improved credit-risk assessment models, and what would be the main obstacles to their practical implementation - regulatory, organisational, or related to the lack of data?

8. Published Articles and Citations.

The results of the dissertation research have been validated and publicly presented through three scientific publications reflecting the principal areas of the study.

The article by Hristo Kostov, Nadezhda Blagoeva and Vanya Georgieva (2025), "Credit Support for the Agricultural Sector in Bulgaria: Structural Analysis and Economic Dimensions", published in Scientific Papers. Series "Management, Economic Engineering in Agriculture and Rural Development", Vol. 25, Issue 1, pp. 549–558, presents the results of a structural analysis of credit support for the agricultural sector in Bulgaria. It examines the structure and dynamics of agricultural lending, as well as the Agricultural Orientation Index, which makes the publication directly related to the empirical part of the dissertation.

The impact of lending on the economic sustainability of agribusiness enterprises is examined in the publication by Hristo Kostov (2025), "Impact of Agricultural Loans in Bulgaria on the Sustainability of Agribusiness Companies", accepted for publication in Scientific Works of the Agricultural University – Plovdiv, Vol. LXVII, Issue 4, pp. 80–90, ISSN 1312-6318 (print), 2367-5845 (online), DOI: 10.22620/sciworks.2025.04.008. The article presents part of the empirical results of the dissertation research relating to the role of agricultural loans in the financial stability and sustainable development of agricultural enterprises. The journal is included in the National Reference List of Contemporary Bulgarian Scientific Publications with Scientific Peer Review.

The social dimension of sustainability in the agricultural sector is further developed in the article by Hristo Kostov (2026), "Bank Lending and the Dynamics of Human Capital in Bulgarian Agriculture: Relationship with the Level and Structure of Employment (2009–2023)", published in E-Journal VFU, Vol. 25, pp. 866–878, ISSN 1313-7514, available at: https://ejournal.vfu.bg/index.php/vfu/article/view/326. The publication presents the results of an analysis of the relationships between bank lending, employment dynamics, and the structure of human capital in Bulgarian agriculture. The journal is also included in the National Reference List of Contemporary Bulgarian Scientific Publications with Scientific Peer Review.

Taken as a whole, the three publications demonstrate the consistent and systematic validation of the results of the dissertation research. They cover interrelated aspects of agricultural lending—its structure and economic dimensions, its impact on the sustainability of agribusiness enterprises, and its relationship with employment and human capital in agriculture. In this way, the doctoral candidate's publication activity presents the principal results of the dissertation in peer-reviewed scientific journals and confirms their scientific and practical significance.

The submitted abstract provides an objective account of the structure and content of the dissertation.

CONCLUSION:

On the basis of the various research methods mastered and applied by the doctoral candidate, the properly conducted research, and the generalisations and conclusions drawn, I consider that the submitted dissertation meets the requirements of the Development of Academic Staff in the Republic of Bulgaria Act and the Regulations of the Agricultural University for its implementation, which gives me grounds to evaluate it **POSITIVELY**.

I respectfully propose that the esteemed Scientific Jury also vote in favour and award **Hristo Vangelov Kostov** the educational and scientific degree of ***"Doctor"*** in the doctoral programme **"Economics and Management (Agriculture)"**.

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Svishtov

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