

STANDPOINT

**for the acquisition of an educational and scientific degree "Doctor" in the
doctoral program "Finance, money circulation, credit, and insurance"
(finance)**

Prepared by: Assoc. Prof. Sergey Rumyanov Radukanov, Department of Finance and Credit, Faculty of Finance, D. A. Tsenov Academy of Economics, Svishtov.

Author of the dissertation: Antoni Valenov Dichev – doctoral student, full-time education, field of higher education: Z. Social, economic, and legal sciences, professional field 3.8. Economics, doctoral program "Finance, money circulation, credit, and insurance" (Finance).

Thesis topic: "Financial risk assessment through machine learning"

Scientific supervisor: Assoc. Prof. Alexander Petrov Ganchev

Assoc. Prof. Krasimira Borisova Slaveva

This opinion has been prepared in accordance with the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria, the Regulations for the Implementation of the Law on the Development of Academic Staff in the Republic of Bulgaria, and the Regulations for the Development of Academic Staff at D. A. Tsenov Academy of Economics - Svishtov.

I. General presentation of the dissertation

The presented dissertation has a total volume of 197 standard pages and contains: an introduction – 9 pages, main text divided into three chapters – 154 pages, conclusion – 4 pages, list of cited and used literature sources – 120 (113 in English, 7 in Bulgarian) and a declaration of originality. The dissertation is illustrated with 34 figures, 43 tables, and 26 equations.

The introduction and conclusion are written in accordance with generally accepted requirements. The three chapters are well balanced and form a complete, logically connected whole.

The dissertation has clearly defined object, subject, purpose, hypotheses, and tasks of scientific research and dissertation thesis. The *object* of the study is financial risk, and the *subject* is the specific algorithms, tools, and methods of machine learning that can be used for quantitative modeling and building effective tools for assessing the main types of financial risk—credit, market, and operational. *The aim of the dissertation* is to reveal the potential added value of applying machine learning as a tool for assessing individual types of financial risk. The approach for selecting algorithms and methods is based on a comparison between two families of algorithms – the so-called traditionally established (classical) methods for assessing financial risk and algorithms based on machine learning.

The doctoral student defends the *thesis* that the application of machine learning methods can significantly improve financial risk assessment by facilitating the detection of otherwise hidden dependencies and interactions through automated processing of large volumes of data, including the ability to quickly adapt to dynamically changing conditions.

The author is very familiar with the problem area, both in theory and in practice. A sufficient amount of specialized literature has been studied—a bibliography of 120 titles is attached to the dissertation. Modern methodology and relevant tools have been used. Useful conclusions, recommendations, and summaries have been made.

II. Assessment of the form and content of the dissertation

The topic discussed in the dissertation is highly relevant, given the growing complexity of financial markets and the increasing role of quantitative models in risk management. Rapid digitization and the significant increase in available data

call into question the effectiveness of some traditional risk assessment approaches and draw attention to machine learning methods. At the same time, the active interest of regulatory authorities and the need for transparency, comprehensibility, and reliability of the models used make the research particularly relevant from both a scientific and practical point of view.

The first chapter of the dissertation establishes the theoretical and conceptual foundation of the research. The author systematizes the main types of financial risk and outlines their significance in the context of contemporary risk management, while also examining key concepts, approaches, and the evolution of machine learning. Special attention is paid to the regulatory framework and institutional requirements, which provides the necessary link between theoretical analysis and the practical application of the methods discussed.

In the second chapter, the author presents the methodological foundations of quantitative financial risk assessment, examining both traditional statistical approaches and machine learning-based methods. A systematic review of the algorithms used, performance evaluation indicators, and model validation techniques is provided, creating the necessary methodological framework for the subsequent empirical analysis. The chapter is logically structured and provides a clear link between the theoretical framework and the practical applications in the next part of the dissertation.

The third chapter is devoted to the practical application of the methods discussed through the development and testing of models for assessing key types of financial risk. The author conducts a comparative analysis between classical and machine learning approaches in specific cases—credit, market, operational, and ESG risk—using realistic data and established performance evaluation criteria. The results obtained are interpreted in a reasoned manner and support the conclusions made regarding the advantages, limitations, and conditions for the applicability of modern algorithms in risk management practice.

The doctoral student's dissertation is distinguished by a high degree of scientific maturity and professional precision. The study is well-founded, consistent, and combines theoretical analysis with empirical research, which gives the work both theoretical value and practical applicability. The presented results and conclusions are convincing and distinguished by their originality, relevance, and significant contribution to the development of the researched topic. On this basis, the following **positive characteristics of the dissertation can be highlighted:**

- 1) Clear and logically consistent structure, ensuring a smooth transition from theoretical analysis to methodology and practical applications;
- 2) Good balance between classical and modern methods for assessing financial risk, presented in the context of current regulatory requirements;
- 3) Methodological correctness and sound reasoning in the selection, application, and comparison of the quantitative models used;
- 4) High degree of practical orientation and applicability of the results obtained, supported by realistic case studies and adequate evaluation criteria.

The author has complied with the rules of scientific ethics - originality of the scientific product, correct citation and referencing, accuracy of the information presented.

The abstract (31 pages) accurately and sufficiently reflects the content of the dissertation.

The doctoral student presents 4 publications – 3 articles and 1 report, thus fulfilling the national requirements. All publications correspond to the subject matter of the dissertation.

III. Scientific and applied scientific contributions of the dissertation

I accept the scientific and applied scientific contributions formulated by the author:

Scientific contribution No. 1. A systematic analysis of the concept of financial risk assessment using machine learning tools has been performed. As a result, the key categories related to financial risk and their place in the construction of financial stability models have been identified, and it has been revealed that machine learning is a key catalyst for innovation in the study of economic and financial processes.

Scientific contribution No. 2. Empirical analysis reveals that in most cases, machine learning-based risk assessment models perform significantly better than those based on traditional methods. This, in turn, justifies the expectations placed on machine learning tools.

Scientific contribution No. 3. The application, resource constraints, and situations in which machine learning models for financial risk assessment are not sufficiently effective, including in comparison with classical models, are outlined, emphasizing the need for their very precise contextual selection and application.

Scientific contribution No. 4. Through a broad empirical analysis, key challenges and limitations in the practical implementation of machine learning-based financial risk management models have been identified, leading to the conclusion that this toolkit is not a temporary technological phenomenon, but a natural and, in practice, a new evolutionary stage in the development of quantitative methods in finance.

II. Questions on the dissertation

I have no questions for the doctoral student.

III. Summary assessment of the dissertation and conclusion

In summary, it can be said that the presented dissertation represents a comprehensive, logically consistent, and methodologically correct scientific study devoted to a topical and significant problem in the theory and practice of financial risk management. The author demonstrates in-depth theoretical knowledge, a very good understanding of contemporary quantitative methods,

and the ability to apply them in a practical context. The results achieved are well-argued and clearly practical in nature, while at the same time taking into account the limitations and challenges of using machine learning methods.

The dissertation meets the basic academic requirements in terms of its structure, the scientific apparatus used, the accuracy of references to sources, and methodological argumentation. The declared scientific contributions are clearly systematized and differentiated in theoretical, methodological, and applied terms, and are logically linked to the subject, objectives, and research tasks set. At the same time, the study is highly relevant and socially significant, contributing to the development of the scientific field of "Finance, money circulation, credit, and insurance (Finance)".

In view of the above, it can be concluded that the dissertation possesses the necessary scientific qualities, originality, and practical value characteristic of a doctoral degree.

Against this background, I give a positive assessment of the dissertation of Antonio Valentinov Dichev for the acquisition of the educational and scientific degree of "Doctor" in the doctoral program "Finance, money circulation, credit, and insurance" (Finance) and propose to the distinguished members of the scientific jury that Antonio Valentinov Dichev be awarded the educational and scientific degree of "Doctor" in the field of higher education 3. "Social, economic, and legal sciences," in the professional direction 3.8. Economics and scientific specialty "Finance, money circulation, credit and insurance" (finance).

Svishtov, December 30, 2025 Member of the Scientific Jury:.....

(Assoc. Prof. S. Radukanov, PhD)