

Higher School for Insurance and Finance (VUZF University)

REVIEW

by Prof. Dr. **Mariana Mateeva Petrova**
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of dissertation for awarding the scientific degree „**Doctor of Science**“
in the field of higher education 3. Social, economic and legal sciences
Professional field 3.8. Economics
PhD program: „Finance, Insurance and Social Security“

Author: Maria Borovska, PhD

Topic: Increasing the financial and economic competitiveness of logistics companies using analytical models

1. General description of the presented materials

By order № 82 of 08.04.2021 of the Rector of the Higher School of Insurance and Finance Assoc. Prof. Dr. Grigoriy Vazov I was appointed as a member of the scientific jury for providing a procedure for defense of a dissertation on the topic of **Increasing the financial and economic competitiveness of logistics companies using analytical models** for obtaining the educational and scientific degree "Doctor of Science" in the field of higher education 3. Social, economic and legal sciences, Professional field 3.8. Economics, PhD program "Finance, Insurance and Social Security". The author of the dissertation is **Dr. Maria Borovska**.

The materials submitted by **Dr. Maria Borovska** include documents according to the presented inventory: reference for the scientific and scientific-applied contributions in the dissertation; reference for fulfillment of the minimum national requirements for acquisition of degree "Doctor of Sciences" in professional field 3.8. Economics; dissertation work; autoreferate. The doctoral student has attached a list of 18 publications on the topic of the dissertation, 3 are in print, includes a list of citations.

2. Relevance of the topic and expediency of the set goals and objectives

With the increase of the autonomy of the economic entities, operating in the conditions of increasing competition, it becomes topical to introduce significant changes in the methods of management of the economic entities, as well as in the methods for monitoring the level of financial and economic competitiveness of the logistics companies.

The modern innovative decision-making process requires the development of objective decisions, which are obtained on the basis of the results of the analysis of the reliability of the information. The complexity of the logistics system management process leads to the need for a wider application of mathematical modeling and related mathematical methods that allow rational management.

The formulated topic is dedicated to a relevant and significant for modern conditions economic problem: the theoretical and practical aspects of the functioning of the logistics system in order to increase the financial and economic competitiveness of logistics companies in various sectors of the economy.

The research thesis models the logic of the dissertation research and the applied analytical tools.

The dissertation is structured in a non-standard way, formed in sections and subsections, but in accordance with the set goal, hypotheses and the subject of the research and reflects the author's approach to the researched topic.

3. Knowledge of the problem

Dr. Maria Borovska shows a thorough and objective formulation and evaluation of the problems explored in the dissertation. 165 literary and internet sources of specialized scientific literature in different languages, normative documents were used and analyzed.

4. Research methodology

For the realization of the set goal and for the solution of the research tasks theoretical and empirical methods of research, methods for modeling and forecasting are used, which form the basis for the use of modeling in logistics.

Own and new research results are presented regarding the probabilistic description of the considered logistics system, which maintains the service center and the quantitative parameters of this system.

5. Characteristics and evaluation of the dissertation

The dissertation consists of an introduction, presentation formed in 10 thematic subsections, grouped in 3 sections, conclusions, literature, list of included figures, tables and formulas, conclusion, appendices. The development is in a total volume of 289 pages (191 pages without appendices), 5 tables and 28 figures are presented, 165 are the used literary and internet sources.

The object of the study is a logistics system that maintains a service center. The logistics system analyzed in the work delivers products to the warehouse, which the service center sells to its customers - recipients.

The subject of the dissertation covers the theoretical and practical aspects of the functioning of the logistics system of the service center, which provides increased financial and economic competitiveness of logistics companies.

The goal of the dissertation is to present a new - innovative method for forecasting, supporting the process of service management to increase the financial and economic competitiveness of logistics companies based on the laws of operation of a probabilistic logistics system, ie. analytical models of these processes in the form of certain systems of equations.

By presenting a new tool - an innovative methodology for determining forecasts that support the management of a service center, based on the analysis of the logistics system, which leads to two variants of the proposed in the work probabilistic model of the logistics system.

Based on the obtained model, the author presents his own innovative method for determining forecasts (in subsections 8 and 10). These forecasts depend on the parameters of the production subsystem, the transport subsystem and the level of filling of the warehouse.

The set goal is important for the economic system, and the solution of the tasks ensures its achievement. The probabilistic dynamic description of the functioning of the analyzed logistics system presented in the paper, the quantitative parameters of the activity of this system and their forecasts are tools with which the efficiency of the system in question can be studied and optimized, as well as a service center. This in turn has a significant impact on increasing the financial and economic competitiveness of this organization.

The first section consists of 3 subsections and is devoted to the theoretical aspects of the issues, and the next two contain an analytical analysis of the operation of the logistics system, which maintains a service center, and forecasts for the operation of logistics companies based on the models.

The results of the study are demonstrated by the example of a binary process of product delivery. Models expressing the obvious dependence of the parameters of the logistics system on the parameters of the system are obtained and analyzed.

A quantitative example is also presented, in which for the described parameters of the system, indicators for estimating the production losses of the system (recipient O and supplier P), indicator for estimating the degree of use of subsystem M, indicators describing the extreme (limit) determine the states of subsystem M, together with a check of the effectiveness of the system design.

Based on this description, a method has been developed for forecasting the characteristics (processes) of the studied logistics system. This description is available in four versions and takes into account both the dynamics of the parameters of the product delivery process from subsystem P and the dynamics of the process parameters describing the operation of the transport subsystem T, as well as various options for the subsystem M.

The results of the research presented in subsections 4, 5, 6, 9 allow to determine the forecasts of the described parameters of the functioning of the logistics system (subsections 8, 10). These forecasts may affect the factors on which the level of financial and economic competitiveness of logistics companies depends significantly.

6. Contributions and significance of development for science and practice

The scientific activity is meaningful when it provides tools for improving and supporting the process of management of the researched object and increases its financial and economic competitiveness. In the presented work, such tools are forecasts of process characteristics that describe the operation of logistics systems. The considered logistics system supporting the service center is universal and can be used comprehensively in different areas of business.

The acquaintance with the dissertation allows to assess that the goal of the research has been achieved, and the tasks arising from it have received adequate solutions. As a consequence, the belief is formed in me that in the dissertation there is enough evidence for scientific and applied contributions.

In the course of the research the following scientific results have been established, which have the potential for scientific contribution:

1. A new, original methodology for determining the forecasts that support the process of managing the services of a logistics system in order to increase the financial and economic competitiveness of logistics companies is presented.
2. The regulations of the functioning of the studied logistics system are derived and presented in the form of the obtained analytical models - systems of differential equations, describing the processes taking place in the logistics system and its subsystems.
3. The obtained and implemented model can be used to obtain quantitative characteristics of bottlenecks and to determine other quantitative indicators describing the operation and correctness of the developed test logistics system.
4. The novelty of the obtained forecasts lies in the fact that they depend on the parameters of the studied logistics system and its subsystems.

Practical and theoretical application of the solutions obtained by the author and presented in the doctoral dissertation:

1. The solutions obtained in the work are tools that improve and support the management process of an economic entity in order to increase its financial and economic competitiveness.
2. The studied logistics system is so flexible that it can be used to improve the quality of management of various systems of the economy.
3. The dependence of the quantitative characteristics of the system and their forecasts obtained in the dissertation on the parameters of the system is an advantage that allows to influence these values in both prognostic and unpredictable aspects in decision making.

7. Evaluation of dissertation publications

The results of the research on the topic of the dissertation are correctly presented to the scientific community with 18 scientific publications, independently and in co-authorship. They are an indicator of the deep scientific interests of the doctoral student, as well as that the scientific contributions to the dissertation are the personal work of the doctoral student. All publications (except those published in Bulgaria) are published mainly in local publications, collective monographs and conference proceedings, there are no publications in established international journals with IF / IR.

Two monographs are presented, one published in the publishing house "Prof. Marin Drinov" in Bulgaria. It is a pleasant impression that the candidate has published some of his peer-reviewed publications in Bulgarian publishing houses - BAS and VUZF.

The publications reflect the achievements of the dissertation obtained in the course of research. The reference shows reflected citations in Google Scholar - 32 citations, H = 3. No registrations are found in other scientific networks.

In most of the attached materials, the scanned publications are difficult to read.

Abstracts of publications accepted for publication are missing.

Separation protocols for joint publications have not been submitted.

8. Assessment of compliance with the minimum national requirements

Attached is a Certificate for fulfillment by the doctoral student of the minimum national requirements for acquiring the educational and scientific degree "Doctor of Science" in the professional field 3.8. Economics. The total number of points is many times higher than required.

9. Assessment of the applicant's personal contribution

The presented dissertation on the topic „**Increasing the financial and economic competitiveness of logistics companies using analytical models**“ is a conscientious scientific and applied research.

I have no doubt about the personal contribution of the doctoral student, expressed in in-depth research, creative thinking and further development of the theory and the problem solved in the work, namely studying and developing the theoretical and practical aspects of the functioning of the logistics system, in order to ensure increasing the financial and economic competitiveness of logistics companies in various sectors of the economy.

10. Autoreferate

The autoreferate consisting of 24 pages has been prepared in accordance with the requirements of LDAS and RILDAS. It is structurally correct and properly reflects the logic and consistency and contributions of the dissertation. It demonstrates the skills of **Dr. Maria Borovska** to synthesize and summarize in order to present her most important ideas and conclusions.

11. Critical comments and recommendations

Although the work is now being defended in 2021, it does not reflect the impact of the Covid-19 pandemic on economic efficiency.

The answer to the following question is also interesting: Would the conclusions of the work change due to the impact of the Covid-19 pandemic?

In some places there is some duplication and repetition of texts.

I recommend presenting the results in specialized international publications with IF / IR, which will allow higher visibility of scientific results and will create conditions for more intensive citation.

12. Personal impressions

I do not know the doctoral student personally. We do not have joint publications and developments.

My impressions come from the dissertation, author's autoreferate and dissertation publications. They show a serious and erudite researcher, a bona fide scientist with an extensive theoretical background and proven ability for independent research.

CONCLUSION

The dissertation contains scientific, scientific-applied and applied results, which represent an original contribution to science and meet all the requirements (s) of LDASRB and RILDASRB. The presented materials and dissertation results correspond to the specific requirements of the

Regulations for admission and training of doctoral students at the Higher School of Insurance and Finance.

The dissertation shows that **Dr. Maria Borovska** has in-depth theoretical knowledge and professional skills in Professional field 3. 8. Economics, demonstrating qualities and skills for independent research.

Due to the above, I give my positive assessment of the research presented by the above-reviewed dissertation, autoreferate, results and contributions, and I invite the scientific jury to award the educational and scientific degree "Doctor of Science" to **Dr. Maria Borovska** in the field of higher education 3. Social, economic and legal sciences; Professional field 3. 8. Economics; PhD program "Finance, Insurance and Social Security".

15.05.2021 г.

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Prof. Dr. Mariana Petrova