



REVIEW

Вх. № PA20-777/22.05.2025г.

by a member of scientific jury for obtaining the educational and scientific degree "PhD"
within a procedure of the University of Economics - Varna

1. General information

- author of the review: Assoc. Prof., PhD, Georgi MARINOV Georgiev, UE-Varna;
- basis for writing the review: participation in the composition of the Scientific Jury for the defence of the dissertation according to the Order Nr. ПД-06-71/23.04.2025 of the Rector of the UE-Varna and the decision of the first meeting of the Scientific Jury held on April 25, 2025, regarding which members of the jury will write a review;
- author of the PhD thesis: Gergana Kamenova Kaloyanova;
- topic of the PhD thesis: **IMPACT OF BREXIT ON THE SUPPLY CHAINS IN GREAT BRITAIN;**

2. PhD student data: Gergana Kamenova Kaloyanova was enrolled in the full-time PhD study in the PhD programme "World Economy and International Economic Relations", managed by the department of International Economic Relations of UE-Varna. The PhD student Kalyanova has fulfilled the minimum requirements of her individual studies plan within the programme and has published the required number of scientific publications. She has been exmatriculated with the right of a defence of a thesis within 5 years, starting from 30.09.2024. I have known Gergana Kaloyanova personally, starting from her student time, as a bachelor student in International Economic Relations major at UE-Varna. She has been among the most prominent students of her cohort, later she has demonstrated very good teaching skills, as a lecturer who is able to attract the attention of the students and to evoke interest in the studied material. Gergana Kaloyanova has covered all the required activities in her individual plan within the deadlines, incl. the PhD exams and publication of scientific papers and participation in scientific events. She has a successful career in the field of management and data analysis, being for a long time a manager within the structure of "Coca-Cola", a fact which additionally contributes to the quality of her scientific publications.

3. The presented dissertation thesis is organised in a standard structure consisting of an introduction, three chapters, where the empirical study is contained in the last chapters, a conclusion, a list of bibliography, and appendices. The volume of the thesis is 170 pages, of which 142 are the core text with 14 figures and 40 tables, and 28 pages contain the list of bibliography and the appendices. Cited are 207 literature sources in Bulgarian and English language. The first chapter, after a general representation of the importance of the supply chains together with their evolution, their global dimensions and the factors leading to their need of development, emphasizes their strategic management (SCM, Supply Chain Management), underscoring the importance of concepts such as JIT and Lean Six Sigma. The chapter is affixed by a digest of risks and challenges to the supply chains, paying attention to the changes in trade treaties, global economic trends, significant exceptional events etc.



leading to shocks and shortages. The second chapter is dedicated to the possible scenarios of Brexit and their effects on the supply chains. The No deal Brexit, "hard Brexit" and "soft Brexit" are discussed in detail both from the organisational point of view - i.e. as changes in border procedures and the activity of the respective services, as well as from the point of view of the cash effects from these changes. Emphasis is placed also on the importance of the foreign workers in the UK and the free movement of labour, the stability of the British economy and the pound, and the fears and expectations from Brexit. The text includes practical examples of EU leave, such as the customs procedures, the dependencies of raw material imports, nonconformity of standards, crossborder investments etc. Analysed is the impact on the supply chains and the new immigration scheme. The third chapter contains the core research of the author. The chapter starts with a brief introduction to the fuzzy Analytical Hierarchical Process (AHP). After building a research hierarchy, following the fuzzy AHP methodology, containing the views of the industry on the challenges for the supply chains, a survey is conducted with the help of managers in various companies. On the basis of the results obtained, several propositions are made about the optimisation of the processes and strategies for coping with the challenges. The text ends with a summary of the results in the conclusion. The abstract of the thesis contains 46 pages, there are also a declaration of originality, as well as other documents, required by the procedure. The minimal national requirements for a "PhD" are covered.

4. Assessment of the structure and the contents of the PhD thesis - the structure and the contents of the presented PhD thesis comply with the current requirements (Art. 34 (2) and (3) of the Order about the development of academic staff in the University of Economics - Varna). As a core goal the author sets the challenge to analyse the impact of Brexit on the supply chains in Great Britain, and respectively researching and emphasising to outline which factors and consequences are linked to the EU leave, as well as whether certain measures can be identified for counterbalancing the unfavourable trends. The thesis is that Brexit exercises a strong influence on the supply chains, and that the effects will force the organisations to undergo certain steps for adaptation, as well as more flexibility in their operations. The author uses a very interesting application of the fuzzy AHP approach, as well as analyses of statistical information. The thesis stands very well as lexical and stylistic usage. The abstract fully and precisely reflects the achievements of the paper.

5. Identification and assessment of scientific and scientific-applicable contributions in the PhD thesis - the author explored and proofed mainly the hypothesis that the supply chains are strongly impacted by Brexit, and that substantial organisational changes in the organisations are needed, mainly towards more flexibility, and to me, this is a very important result. Methodologically - I consider the research methods used being well chosen and correctly applied. A special contribution of the thesis is the application of a specific fuzzy AHP approach with consecutive comparative study of the structures emerged, combined with documental analysis and analysis of statistical data. This allows to point out plausible conclusions on data for the specific study. The proposition drawn among the results from the



study about increasing the readiness for reaction of the supply chains in future challenges and crises can also be reckoned as a strongly valuable scientific result, possessing in the same time also significant practical dimensions, and this ranges the thesis among the well done both as a result and as importance in the contemporary Bulgarian economic science about the international markets.

6. Publications and participation in scientific events: the presented related to the PhD thesis publications and participations in scientific events comply with the minimum national requirements for the granting of the educational and scientific degree "PhD", according to Art. 26, (2) and (3) of the Law about the development of the academic staff in the Republic of Bulgaria and with the Art. 35, p. 1-4 of the Order about the development of the academic staff in UE-Varna. Related to the PhD thesis, Gergana Kaloyanova has published 4 scientific papers (resulting in points in the group of indicators "G" above the min. 30 points), of which 3 scientific reports and 1 scientific journal paper. The scientific reports are presented in various scientific events in Bulgaria and abroad, incl. at the UNWE and Tsenov Academy-Svishtov, a circumstance which significantly widens the visibility of the results obtained.

7. Detected or not detected plagiarism in the PhD thesis and in the abstract - I do not find any traces of plagiarism in both the thesis and the abstract, as well as in the collateral scientific publications. In addition, the author demonstrates a high level of originality of expression and of the ideas presented.

8. Critical remarks and recommendations - as far as the research is elaborated on the base of data for Great Britain, and in the same time the results obtained demonstrate a significant importance, incl. in the social dimension, I think of an extension of the study, naturally only as modelling of the effects by potential participation or non-participation in the EU, to include other groups of similar countries - i.e. the Bulgarian neighbour (or the Balkan) countries, EU and non-EU. An additional check of the results on more detailed data would also be a plus. However, reflecting the existing reality, both as the volume of PhD theses, and more importantly the scope of available data, this comment has to be regarded rather as an advice for future research.

9. Questions to the author - does the author have any additional concerns about the plausibility of the statements (the answers) in the survey? What would be the applicability of the results to other countries in the EU, mainly to the Balkan countries? What are the current prospects under a possible future EU leave for the impacts for the supply chains of the countries to differ substantially from that of Brexit?

10. In conclusion - the PhD thesis of Gergana Kaloyanova is a comprehensive scientific study on a relevant economic issue. The study comprises both theoretical and empirical components and has been elaborated at the level of contemporary science. The research adheres to the highest standards for similar works. The thesis contains both scientific and practical contributions, offering originality in the field. The thesis is entirely an achievement of its author, who demonstrates in-depth knowledge about the problem studied, as well as ability for independent thinking. Taking all of the above into account, I strongly support the



awarding of the academic title "PhD" to Gergana Kamenova Kaloyanova and I encourage the scientific jury to also vote positively.

Reviewer:

Заличена информация съгласно
ЗЗЛД и регламент (ЕС) 2016/ 679

(Assoc. Prof. Georgi MARINOV, PhD)

21.05.2025.

REVIEW

by Prof. Virginia Ivanova Zhelyazkova, DSc

from the Economic Research Institute at the Bulgarian Academy of Sciences and from
YUZF University

of the dissertation titled:

"The Impact of Brexit on Supply Chains in the United Kingdom"

by Gergana Kamenova Kaloyanova,

submitted for the award of the educational and scientific degree "Doctor" in the doctoral
programme "World Economy and International Economic Relations"

at the University of Economics – Varna

Grounds for preparing the review This review has been prepared pursuant to Order No. RD-06-71/23.04.2025 of the Rector of the University of Economics – Varna, which appoints a scientific jury for the award of the educational and scientific degree "Doctor" under the present procedure.

Information about the PhD candidate

Gergana Kaloyanova is a full-time doctoral student at the Department of International Economic Relations at the University of Economics – Varna. She holds a Master's degree in Economics and possesses excellent academic preparation in international trade and logistics. During her doctoral studies, she successfully passed the required examinations and actively participated in the research activities of the department. Her interest in Brexit and supply chains

has been consistently developed through participation in scientific forums and publications reflecting the stages of her research.

The candidate also has substantial professional experience in the corporate sector. Between 2013 and 2024, she held various positions related to supply chain operations in different companies, including the last five years at Coca-Cola. This experience has enabled her to deeply understand the processes she explores and to analyse them in the context of Brexit. Gergana Kaloyanova has also been gaining experience as a lecturer, teaching the course "Global Supply Chain Management," which is directly related to her research interests.

General presentation of the dissertation Gergana Kaloyanova's dissertation is a comprehensive, logically consistent, and methodologically grounded research project that addresses a significant issue in the field of international economics and logistics—how disintegration processes such as Brexit affect the configuration, efficiency, and resilience of supply chains. The dissertation spans 170 pages and includes 21 appendices. It is structured in three main chapters, each of which contributes to the logical and analytical development of the research thesis. A total of 207 bibliographic sources have been used, reflecting the breadth of the research scope and academic rigour. The general approach is interdisciplinary, combining elements of international trade, logistics, economics, and risk management.

The first chapter (pp. 7–47) presents the theoretical framework of the study in detail. The author reviews the conceptual evolution of the term "supply chain," offering an original definition (pp. 18–19) that enhances existing ones by integrating digital transformation, sustainability, and strategic adaptability. The development of supply chains from linear to networked and digital structures is traced, highlighting the importance of integration and resilient functioning under shocks. A comparative analysis of terminology is provided (pp. 8–13), as well as a systematisation of classifications by length, width, synchronicity, and flexibility (pp. 30–35). Management approaches such as Lean, Six Sigma, and JIT are discussed critically in terms of their vulnerabilities to external crises like Brexit. A notable contribution is the emphasis on the interrelation between digitalisation and sustainability as sources of supply chain resilience (pp. 40–46).

The second chapter (pp. 48–97) analyses the institutional, economic, and regulatory transformations resulting from Brexit and their impact on UK supply chains. The author systematises the different exit scenarios from the EU and tracks the consequences of the realised

"hard" Brexit on trade flows, customs procedures, regulations, and the labour market. The new immigration framework and its impact on access to low-skilled labour—critical to the logistics and agri-food sectors—are examined (pp. 61–66). The chapter focuses on FX volatility and regulatory fragmentation as major sources of uncertainty. The analysis is supported by up-to-date statistical data, graphs, and reports from the OECD, UK Trade Statistics, and the House of Commons. Particular attention is paid to vulnerabilities in sectors such as automotive (pp. 72–75), pharmaceuticals (pp. 76–78), and food processing (pp. 79–83), with specific supply chain challenges and business responses identified for each.

The third chapter (pp. 98–137) is entirely empirical and presents original research using the Fuzzy AHP method—a technique that allows the evaluation of multiple factors under uncertainty. The theoretical foundation of the method is set out (pp. 99–106), followed by a description of the construction of the hierarchical model, the definition of criteria, a survey of 18 logistics experts from the UK, data processing, and the ranking of influencing factors (pp. 107–130). The analysis reveals that administrative burden, currency volatility, and regulatory uncertainty are the most influential factors, followed by labour shortages and customs delays. On pp. 131–137, the author proposes concrete business adaptation strategies, including supplier diversification, reshoring, digitalisation, and the development of buffer capacities.

Scientific and applied contributions

The dissertation stands out with notable contributions at the theoretical, methodological, and applied levels. Theoretically, the author's definition of the term "supply chain" (pp. 18–19) expands upon classical interpretations by integrating key concepts such as sustainability, digital transformation, and adaptability. This definition is grounded in a thorough comparative analysis (pp. 8–13), highlighting the limitations of existing formulations and the need for conceptual renewal. A second theoretical contribution lies in the systematisation of supply chain classifications (pp. 30–35) and the focus on resilience as a central paradigm in modern supply chain management.

Methodologically, the dissertation contributes through the adaptation and application of the Fuzzy AHP method to the specific research objective—assessing the multiple factors influencing supply chains post-Brexit. The study (pp. 99–130) shows deep understanding and seamless integration of this technique within the structure of the dissertation. The author constructs a sound

hierarchical model and conducts an expert survey, yielding valid and applicable results for managerial decision-making.

At the applied level, the author provides clear strategies for business adaptation in the logistics and industry sectors (pp. 131–137). These strategies include measures to address administrative and regulatory burdens, mechanisms for maintaining operational flexibility and buffer capabilities, and recommendations for supplier diversification and digital tool adoption. Moreover, the author effectively isolates the effects of Brexit from other global shocks such as the COVID-19 pandemic and geopolitical crises (see introduction, p. 6), which strengthens the analytical clarity of the findings.

A particularly important contribution is the sectoral vulnerability analysis and business response assessment, including case studies from the automotive, pharmaceutical, and agri-processing sectors (pp. 72–85). The findings are relevant not only to the UK but also to other countries that are closely linked to global supply chains or considering reforms in their trade relationships.

Publications and academic activity of the PhD candidate

The PhD candidate has published four scientific papers related to the topic of her dissertation. Two of them have been published in peer-reviewed proceedings of international conferences dedicated to sustainable supply chain management and logistics after Brexit, where the author presented initial results of her research.

The other two publications appear in academic journals. These focus on the methodological framework and the application of Fuzzy AHP in supply chain analysis. The thematic scope of the publications covers both theoretical aspects—definitions and conceptualisation of resilient supply chains—and applied research, including sectoral analyses, the effects of new trade regimes, and adaptation proposals. The candidate's participation in scientific forums and conferences, including English-language presentations in front of international audiences, demonstrates her active engagement and integration within the academic community.

Critical notes and recommendations

Although the dissertation fully meets academic requirements, future research could benefit from extending the comparative dimension by incorporating data from other countries strongly linked to the British economy.

It would also be valuable to explore the long-term implications for corporate environmental goals and ESG standard integration within supply chain governance frameworks.

Questions for the PhD Candidate

1. How would you adapt the strategies you propose for other economies that might withdraw from trade unions?
2. According to your findings, what role do digital technologies play in enhancing supply chain resilience?

Conclusion

The dissertation by Gergana Kaloyanova is a well-structured, original, and methodologically sound piece of research that holds both theoretical and practical significance. Its results are well-founded, clearly presented, and empirically substantiated. The dissertation meets all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and the internal rules of the University of Economics – Varna. Based on the above, I propose that the esteemed scientific jury award Gergana Kaloyanova the educational and scientific degree "Doctor" in the doctoral programme "World Economy and International Economic Relations."

22 May 2025

Sofia

Reviewer:

Заличена информация съгласно
33/Д и регламент (ЕС) 2016/ 679

/Prof. Virginia Ivanova Zhelyazkova, DSc/