

TO
THE UNIVERSITY OF
INSURANCE AND FINANCE

OPINION

by Prof. Dr. Bogomil Manov, Doctor of Economics, Professional Field 3.8 "Economics," Department of Finance, University of National and World Economy (UNWE) regarding the dissertation here below for the attribution of the scientific degree "Doctor of Sciences" in Higher Education Area 3: Social, Economic, and Legal Sciences; Professional Field 3.8: Economics

Author: Prof. Dr. Andrey Boyanov Zahariev

Topic: "Housing Revaluation in Bulgaria: Factors, Models, Trends"

1. General description of the submitted materials

By Order No. 322 dated July 24, 2026, issued by the Rector of the University of Insurance and Finance, Corresponding Member Prof. Boris Velchev, D.Sc. (Law), I was appointed as a member of the scientific jury for the defense hearing related to the dissertation "Revaluation of Housing in Bulgaria: Factors, Models, Trends" for the attribution of the academic degree of "Doctor of Sciences" in Higher Education Field 3: Social, Economic, and Legal Sciences. Professional Field 3.8. Economics. The author of the dissertation is Prof. Dr. Andrey Boyanov Zahariev – a candidate from the Department of Finance and Insurance at the University of Finance, Business and Entrepreneurship (VUZF). By a decision of the scientific jury at its first meeting, I was assigned to prepare an opinion for the purpose of the hearing.

Accordingly, this document has been prepared based on a template structure for an expert opinion regarding the procedure of hearing for attribution of the academic degree of "Doctor of Economics" at UZF, as well as the documents submitted for the same purpose.

For the purposes of this opinion, I received an electronic copy of the dissertation, written in Bulgarian and comprising 390 pages (including 328 pages of main text, 30 pages of appendices, and 32 pages of references and front matter). The submitted materials include a declaration of authenticity, a list of publications related to the dissertation topic, a statement of compliance with the requirements of the Regulations for the Application of the Act for the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), a scientific-metric report, the candidate's CV, and a copy of the PhD diploma. The candidate submits for evaluation a total of 32 publications related to the dissertation topic, issued between 2012 and 2026, distributed according to the criteria of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADASRB) as follows: indicator G6 – 4 articles in journals refereed and indexed in Scopus/Web of Science; indicator G7 – 22 articles and papers in non-refereed journals and conference proceedings; indicator G8 – 2 studies in journals refereed and indexed in Scopus/Web of Science; indicator G9 – 4 studies in non-refereed journals. The materials related to the procedure are well-structured and systematically organized, facilitating their review and analysis.

2. Brief biographical details of the candidate

Prof. Dr. Andrey Boyanov Zahariev was born on March 19, 1971. He completed his higher education in Economics, obtaining a Master's degree from the D. A. Tsenov Academy of

Economics in Svishtov, specializing in "Economics and Management of Industry" (1989–1994). In 1999, he obtained the educational and scientific degree of "Doctor" in the scientific specialty 05.02.05 "Finance, Monetary Circulation, Credit, and Insurance," thereby fulfilling the requirement of Art. 12, Para. 1 of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB).

His academic career has progressed through the successive ranks of Assistant (1999), Chief Assistant (2000), Associate Professor (2001), and Professor (since December 10, 2012) at the D. A. Tsenov Academy of Economics in Svishtov. Since November 2024, he has served as a visiting professor, and since June 2025, as a full-time professor at the University of Insurance and Finance (VUZF), where he lectures in "Fundamentals of Finance and Economic Theories," "Financial Risk Management," "Portfolio Management," "Business Planning," and "European Projects and Investments."

Prof. Zakhariiev possesses extensive leadership experience, having served as a coordinator and director of master's degree training centers servicing in-presence and remote, Vice-Rector for Master's and Doctoral Studies (2007–2010), Head of the Finance and Credit Department (2012–2015 and 2016–2020), and Dean of the Faculty of Finance (2020–2024) at the D. A. Tsenov Academy of Economics. He has been awarded the honorary title of Doctor Honoris Causa by the Vasyl Stus Donetsk National University, Ukraine (2017), and Honorary Professor at Artifex University, Bucharest (2024). He has participated in 37 national and international projects. He is credited with 281 publications in NACID; in Scopus, he holds an h-index of 8 (based on 12 articles and 100 citations), and in Web of Science, an h-index of 5 (based on 9 articles and 49 citations). He successfully trained and supervised 18 doctoral students on the hearing of their theses prior to joining UZF and currently supervises four doctoral students, including three from abroad.

3. Characteristics and assessment of the dissertation

The dissertation topic is relevant and of importance. The study examines the process of housing revaluation in Bulgaria within the context of the country's accession to the Eurozone on January 1, 2026 – an event that culminates a nearly thirty-year process of currency convergence, which began with the introduction of the currency board in 1997. The author identifies a research gap concerning the lack of systematized empirical models testing which determinants of housing prices remain constant during prolonged currency convergence. The main objective of the dissertation is to examine the housing revaluation process in Bulgaria through an analysis of growth factors and the modeling of the dynamics and acceleration of price corrections over the 2015–2025 period. Three working hypotheses and three research objectives have been formulated, corresponding to the structure of the three chapters. I consider the stated objective and tasks accurate and relevant.

The dissertation, the abstract, and the submitted publications demonstrate a deep understanding of the subject. The 316 sources used (269 in Latin script and 47 in Cyrillic) encompass leading publications in the fields of finance, housing market, macroeconomic modeling, and spatial econometrics, organized into five thematically focused groups spanning the period from 1990 to the present. In addition to the literature, the author uses extensive empirical data from Eurostat, the NSI, the BNB, and the World steel producers' association, studied by the using of a set of tools comprising 54 predictors across five thematic groups.

The research methodology employs induction and deduction, comparative analysis, predictor grouping, descriptive statistics, regression-correlation modeling, ADF, PP, and KPSS stationarity tests, and autoregressive integrated moving average models with exogenous predictors (ARIMAX), as well as the Ljung–Box, Shapiro–Wilk, Kolmogorov–Smirnov, and ARCH LM diagnostic tests. A significant methodological contribution is the original five-step procedure for ARIMAX modeling, adapted for the analysis of the acceleration of revaluation using small samples of quarterly data. The methodology employed is appropriately selected, well-described, and fully aligned with the established research objectives.

The dissertation is structured into three chapters, preceded by an introduction and conclusion with a summary, appendices, and thorough bibliography. The introduction correctly defines the study's relevance, object, subject, thesis, working hypotheses, aim, objectives, methodology, and scope. Chapter One ("Critical Assessment of Factors Influencing Housing Revaluation: Theoretical and Applied Findings") proposes an original multi-criteria framework categorizing the research into five thematic areas and a five-period classification of academic analysis of housing prices (1990–present). Chapter Two ("An Investigation into the Factors Driving Housing Revaluation in Bulgaria") presents an empirical analysis of 54 predictors across five thematic groups, conducted by using descriptive statistics, correlation analysis, and the author's own alpha-beta comparative analysis covering 41 quarters (2015Q4–2025Q4). Chapter Three ("Empirical Study of Housing Revaluation in Bulgaria, 2015–2025") forms the core of the dissertation - Three ARIMAX models were constructed and verified: ARIMAX(0,2,1) for GHPI ($R^2 = 0.727$, MAPE = 1.026%), ARIMAX(1,2,0) for HPIED ($R^2 = 0.735$), and ARIMAX(1,1,0) for HPIND ($R^2 = 0.418$), all of which succeeded a full battery of diagnostic tests. A significant finding is that traditional macroeconomic aggregates do not demonstrate statistical significance, whereas sector-specific determinants do.

The conclusion summarizes the results and outlines nine contributions and ten directions for future research. The writing style is clear and precise, employing appropriate academic language maintaining logical coherence between structural elements, supported by extensive illustrative material.

4. Contributions and significance of the study for science and practice

I accept the nine contributions of the dissertation formulated by the author, namely:

- 1) An original multi-criteria analytical framework has been developed for the critical synthesis of academic literature on housing pricing factors, integrating five thematically focused groups.
- 2) An original five-period chronological classification of academic analysis regarding housing prices from 1990 to the present has been proposed, alongside an original systematization of research contributions concerning the housing market in Bulgaria.
- 3) An original theoretical framework has been developed and also verified, positioning housing within the five-component systematization of national wealth and its three-tier structure based on economic agents.
- 4) An original methodological approach has been developed and also verified for the simultaneous parametric estimation of two alternative single regression models (alpha-beta comparative analysis), applied to 54 predictors and three dependent variables.
- 5) A comprehensive regression-correlation framework has been developed and verified, systematizing 54 predictors into five thematic groups, and the empirical hierarchy of their impact on three measures of the housing price index has been established.
- 6) Based on a comparative analysis of the HPI across all 27 EU member states, it has been determined that the rise in housing prices in Bulgaria is 2.2 times higher than the EU-27 average, and the specific institutional factors driving this have been identified.
- 7) An original five-step methodological procedure for ARIMAX modeling has been developed and applied, adapted for analyzing the acceleration of revaluation using small samples of quarterly data.
- 8) For the first time in Bulgarian academic literature, three distinct ARIMAX models have been constructed and also verified for the three dimensions of the housing price index: GHPI, HPIED, and HPIND.
- 9) The sector-specific determinants of the accelerated revaluation of housing in Bulgaria are identified, while aggregated macroeconomic indicators are rejected as statistically significant price predictors.

The formulated contributions have both theoretical and practical significance for institutional policy development, macro-prudential regulation and financial stability monitoring in the new currency system. For the academic field specifically, the significance of the contributions lies

in the development of a new theoretical and methodological framework for the purpose of studying housing wealth – ranging from the original periodization and systematization of the literature and the positioning of housing within the structure of national wealth, to the first three verified ARIMAX models of the housing price index in Bulgarian academic literature, derived using a proprietary five-step procedure for small samples.

For practical purposes, the significance stems from the established empirical hierarchy of 54 determinants and the rejection of aggregated macroeconomic indicators as significant predictors; this provides institutions (the BNB and the FSC) and policymakers with a concrete, statistically grounded toolkit for the purpose of monitoring and macro-prudential regulation of the housing market under the new currency regime.

5. Assessment of publications related to the dissertation

According to the submitted list of publications (Appendix 6), the candidate, Prof. Dr. Andrey Zahariev, participates in the procedure with a total of 32 publications, distributed across four categories defined by the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), as follows: indicator G6 – 4 articles in publications refereed and indexed in Scopus/Web of Science, totaling 25.29 points; indicator G7 – 22 articles and papers in non-refereed journals and conference proceedings, totaling 150.33 points; indicator G8 – 2 studies in publications refereed and indexed in Scopus/Web of Science, totaling 18.75 points; Indicator G9 – 4 studies in non-refereed publications, totaling 40.50 points. The total score for Group G amounts to 234.87 points against a requirement of 100, meaning the minimum threshold has been exceeded more than twofold.

The publications cover a period of 15 years (2012–2026). Indicators G7 and G9, comprising 26 publications, reflect the presentation of papers at national and international scientific conferences in Bulgaria, Ukraine, Romania, Croatia, and Moldova, as well as articles and studies in national and international academic journals. The most recent publications examine the latest data on housing revaluation in Bulgaria. These include three articles/reports from 2025–2026 (covering new housing prices, residential construction, and real estate transactions in Bulgaria) and the study published in the **Journal of Risk and Financial Management** (2026) titled "House Price Determinants: Evidence from Bulgaria as a New Eurozone Member State," just before the present hearing and directly entail the object and subject of the research, which is a good indication for approbation of the obtained results. The second study under indicator G8, in the journal *Sustainability* (2026), is in a similar thematic area - regional development, as a factor supporting the revaluation of the housing stock. The remaining publications under indicators G6, G7 and G9 (in the field of public finance, currency risk, fiscal policy and capital markets) focus on the broad spectrum of descriptors influencing housing revaluation. They further demonstrate long-standing and established research expertise in the fields of applied econometrics and financial analysis, upon which the dissertation's methodology is built.

I consider the publications to be sufficient in number and thematically relevant to the main subject, covering both the theoretical-methodological and empirical aspects of the research.

6. Assessment of compliance with minimum national requirements

According to the submitted scientific-metric report and the list of publications and citations, the minimum national requirements for the attribution of scientific degree "Doctor of Sciences" under Art. 12 of the Law on the Promotion of Research and Education of the Republic of Bulgaria have been met, with the candidate exceeding the required thresholds. For indicators from group D (6, 7 and 8), a result exceeding more than twice the required minimum of 100 points has been achieved, and according to the citation data submitted by the candidate (100 citations in Scopus, h-index of 8), the requirement for Group D is also met. While these data are not subject to independent verification within the scope of this opinion, they should be officially confirmed by the report prepared by the relevant administrative unit; however, based on the materials provided, I consider that the candidate fully meets the requirements of Art. 12,

Para. 4 of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADASRB)—namely, that the dissertation contains theoretical generalizations and solutions to major scientific or applied-scientific problems that align with contemporary scientific achievements.

7. Abstract

The submitted 50-page abstract accurately and comprehensively reflects the content of the dissertation – its relevance, object, subject, thesis, working hypotheses, aim, objectives, methodology, and research scope; a summary of the three chapters; a list of scientific and applied scientific contributions; directions for future research; and a record of publications and scientific-metric indicators. I consider that the abstract faithfully represents the content and contributions of the dissertation.

8. Critical remarks and recommendations

The dissertation is of high scientific quality and leaves no doubt as to the author's ability to independently conduct in-depth scientific research. Rather than offering critical remarks, I would like to suggest the following directions for future research:

First, the variation in explanatory power among the three ARIMAX models (R^2 values ranging from 0.418 to 0.735) points to a need for further investigation into factors specific to HPIND, as well as a comparison with international experience regarding the role of macroeconomic aggregates in similar models for CEE countries.

Second, the sample of 41 quarters used and the alpha-beta methodology applied to select 54 predictors point to the prospect of extending the time horizon and further formalizing the predictor selection criteria, in order to enable further researcher to replicate the approach.

These observations do not devalue the quality of the scientific and applied scientific merits of the dissertation.

CONCLUSION

The dissertation titled "Revaluation of Housing in Bulgaria: Factors, Models, and Trends" presents significant scientific and applied-scientific results and meets the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for its implementation, as well as the specific requirements of rules governing the conditions and procedure for the attribution of scientific degree of "Doctor of Sciences" at the University of Insurance and Finance.

The dissertation demonstrates that Prof. Dr. Andrey Boyanov Zahariev possesses in-depth theoretical knowledge and professional skills in Professional Field 3.8 (Economics), as well as the ability to conduct independent, high-level scientific research.

Based on the above, I give a positive assessment on the reviewed dissertation, the abstract, the publications, and the results and contributions, and I support before the esteemed scientific jury the attribution of the academic degree of "Doctor of Sciences" to Prof. Dr. Andrey Boyanov Zahariev in Higher Education Area 3: Social, Economic, and Legal Sciences, Professional Field 3.8: Economics.

August 18, 2026

Sofia

Opinion prepared by:

(Prof. Dr. Bogomil Manov)