REVIEW

of the dissertation "CURRENT PROBLEMS IN THE VALUATION OF EQUITY INSTRUMENTS"

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Training Chair: Department of Finance and Credit at the Faculty of Finance
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Dear members of the scientific jury,

The topic of the dissertation of PhD student Vladislav Lyubomirov Lyubenov is "Current Problems in the Valuation of Equity Instruments". This review has been developed in accordance with the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria - RARARB, the Regulations for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria - RARASRB and the Rules of Internal Order of the Academy of Economics "D. A. Tsenov".

1. General information about the PhD student

PhD student Vladislav Lyubenov has studied in a doctoral program at the Department of Finance and Credit at the D. A. Tsenov Academy of Economics in the scientific specialty "Finance, Money Circulation, Credit and Insurance (Finance)". He graduated with a bachelor's and master's degree at the D. A.

Tsenov Academy of Economics, distinguished by a deep academic interest in the problems of investments and corporate finance.

2. **General presentation of the dissertation, assessment of the form and structure of the dissertation.**

The dissertation submitted for review has the characteristics of a completed research for the acquisition of the educational and scientific degree of "Doctor". The introduction sets out the mandatory relevance of the topic, object and subject of research, thesis, purpose, tasks and methodology, and the development in this part fully meets the established academic standards.

The subject of the dissertation is the exchange-traded capital financial instruments, with an emphasis on stocks and ETFs, and the subject is focused on the ways of their valuation and the influence of exogenous factors on group market valuation. The thesis is adequately formulated and contains the necessary scientific problem: "the expectations for the future return on the capital market are directly comparable with the macroeconomic indicators of the real sector of the economy". The goal and objectives are clearly set, and the goal is to create a contribution to the scientific literature through an empirical study of the relationships between the value of the capital market and macroeconomic indicators. Of particular interest is the structuring of the study around the testing of working hypotheses, which contributes to the analytical depth of the work.

Regarding the formal requirements, the dissertation contains 13 tables and 11 figures, with a total volume of 254 standard pages, including an introduction, a main text divided into three chapters, a conclusion, a list of cited and used literature sources and a declaration of originality.

The bibliography uses 103 literary sources. The PhD student is the author of 5 publications, according to the attached reference, with a total of 40 points under the Regulations for the Development of the Academic Staff. The PhD student was enrolled by Order No. 135/15.03.2021, and the training began on 01.04.2021 with a period of 3 years. It is closed with the right of defense.

These facts confirm that the dissertation meets both the substantive and the formal requirements for the defense of the educational and scientific degree "Doctor".

3. Scientific and substantive evaluation of the development

The relevance of the dissertation under consideration is determined by the increased need to improve the existing models for forecasting inflation and consumption, especially in the conditions of the dynamically changing economic environment. In recent decades, the effectiveness of traditional forecasting methods has been questioned, which requires the development of new approaches capable of taking into account the changing interconnections between financial markets and macroeconomic indicators. From a practical point of view, the topic is particularly important, as accurate inflation forecasts are key both for the correct valuation of equity instruments and for the effective conduct of monetary policy.

Based on the existing knowledge in the field, in the study the PhD student formulates the following working hypotheses, which determine the main tasks of the dissertation:

1) Different valuation and forecast models for stock prices, systematic risk and macroeconomic impact on the capital market demonstrate different degrees of efficiency and interpretation depending on the factors used.
2) The time horizon has a significant impact on the accuracy of market forecasts, with different periods requiring different models for predicting price movements.
3) The capitalization yield of stocks has a predictive potential and can be used as an indicator of future inflationary dynamics.
4) There is a statistically significant relationship between changes in consumer behavior, inflation and stock market prices, and these correlations are also reflected in the value of broad stock indices.

In accordance with the main goal and the defined working hypotheses, the study sets the following specific tasks:

- Development of a model to enrich the toolkit for analyzing the relationship between inflation and financial markets by integrating the stochastic discount factor as a key element in the theory of asset valuation, in order to more accurately determine the fair value of equity instruments.
- Exploring possibilities for more accurate forecasting of inflation as a major factor in assessing future cash flows and real profitability of financial instruments, especially in conditions of variable inflation.
- Identify statistically significant relationships between capital markets, macroeconomic indicators, consumer behaviour and the effect of welfare on aggregate demand, in order to better understand the mechanisms for the formation of risk premiums and the valuation of equity instruments.

The methodology of the study is based on the use of:

- Basic descriptive statistics, including standard deviation, arithmetic mean, variation and correlation analysis;
- Regression analysis by applying the Generalized Method of Moments to assess the influence of various factors;
- Analysis of time series for inflation forecasting on a database of financial markets.

The theoretical foundations of the methodology used are detailed in the second chapter of the dissertation, while the application of the specific models and techniques is carried out in the third chapter.

The empirical part of the dissertation is based on an extensive data set covering the period from 1985 to 2022, using monthly and quarterly observations. The main empirical indicators include: The Consumer Price Index (CPIAUCSL) to measure inflation, the return of the S&P 500 index as a measure of market returns, and the Federal Reserve's overnight interest rate to determine risk-free yields. Additional macroeconomic indicators such as the unemployment rate, savings level, consumer spending and interest rate spreads were used to validate the models, providing a comprehensive analysis of the interlinkages between financial markets and inflationary processes.

4. Content of the dissertation

The structure of the dissertation is developed in the classic three chapters. The balanced structure contributes to the realization of the goals and objectives set.

In the introduction, the topicality of the topic is justified, the object and subject of the research are defined, the main research thesis, purpose, tasks and methodology used are formulated. The main emphasis is placed on the need to develop new models for valuing stocks and forecasting inflation in today's dynamic economic environment.

The first chapter is titled "Theoretical Foundations, Studies and Concepts for Valuation of Shares" in the volume of 89 pages. This chapter presents the theoretical framework of stock valuation. Basic models such as dividend discounting, free cash flow valuation and Residual Income models are considered. Ratio methods such as P/E, as well as risk assessment concepts such as linear models and methods such as VaR, are also analyzed. ARIMA, GARCH and VAR models in the context of stock valuation.

The second chapter is "Methodology of the Empirical Study of Financial Markets" of 69 pages. In this part, the empirical approach to analysis is described. The methods of linear and multivariate regression are used. Time series models are applied – ARIMA, GARCH, VAR. Specific financial models for return and risk are constructed. The use of the Generalized Method of Moments (GMM) for analyzing the relationships between the return on equity instruments and macroeconomic indicators is described.

Chapter Three, "Empirical Study of the Impact of Profitability from Financial Instruments on Economic Indicators" has a volume of 67 pages. The chapter is devoted to the practical application of the developed methodology. For the purposes of comparative analysis, various variants of the Phillips curve and other classical models for forecasting inflation have been applied, and the results obtained have been verified through a wide range of statistical tests and criteria for assessing their predictive ability. The empirical results confirm the high statistical significance of the developed ADL-SDF model, especially for short-term inflation forecasts, while also highlighting the limitations of traditional forecast models in the context of modern economic dynamics.

The main highlights in this section are:

- Inflation forecasting using the ADL-SDF (Stochastic Discount Factor) model;
- Comparison of different models for forecasting inflation;
- Study of the effect of the capital market on consumption through the analysis of household well-being;
- Summary of empirical results confirming the significant role of capital income as a predictor of inflationary dynamics and consumer behavior.

The main conclusions of the study are formulated in the conclusion, emphasizing the established relationship between the capitalization yield of shares, inflation and consumption. Possible directions for future research related to the expansion of the modeling of financial dependencies in an unstable economic environment are also indicated.

5. Scientific and scientific-applied contributions to the dissertation.

The dissertation presents original results that contribute to the development of the theory in the field of valuation of financial assets and inflation forecasting, as well as to the practical application of these models in the modern economic environment. On the basis of the theoretical research, the developed author's models and the detailed empirical verification, the following clearly formulated scientific and scientifically applied contributions can be deduced. They reflect the novelty, significance and applicability of the results of the dissertation work both in research and in the practice of financial analysis and economic forecasting.

1) Construction of a new mathematical model for the relationship between inflation and the capital market. The PhD student developed two author's

models: ADL-SDF (Autoregressive Distribution Lag with Stochastic Discount Factor Included) and NKPC-SDF (New Keynesian Phillips Curve with Stochastic Discount Factor). Through these models, the hypothesis was verified that the return on the capital market precedes proportional changes in inflation by one month. that the inflation premium remains relevant in financial modelling.

2) Statistical study of the influence of capitalized income on the well-being and consumption of households. The role of capitalized income in household budgets is studied by modeling the effect of welfare on consumer spending.

3) Identification of influencing factors in the short and medium term on well-being. Statistically significant factors have been identified: unemployment and savings (for monthly surveys) and debt and inflation payments (for quarterly surveys) as the main determinants of the effect of well-being on household expenditures. The PhD student reasonably identifies the influencing factors, but the analysis is mainly focused on a few macroeconomic factors indicators (unemployment, savings, debt, inflation). For a stronger rationale, it would be useful to extend the analysis to additional factors such as bond yields, consumer credit and labor income.

The main requested scientific contributions have been implemented and supported by reasoned empirical research, up-to-date statistical methodology has been applied. The innovativeness of the dissertation is found mainly in the integration of a stochastic discount factor in the modeling of inflationary processes and in the quantitative linking of welfare with consumption.

6. Evaluation of dissertation publications

The PhD student is the author of 5 publications on the topic of the dissertation, including one scientific article and two research papers independently and participates as a co-author in two research papers. The publications are proof of the ability to promote the author's ideas among the community. The total number of points collected is 40, which covers the national requirements.

7. Evaluation of the abstract

The presented abstract by PhD student Lyubenov presents in an optimal way what has been achieved in the dissertation. Through the abstract, the PhD student confirms the ability to analyze and synthesize, create models, and systematize conclusions.

8. Critical remarks, recommendations, and questions

I do not have any significant critical remarks and recommendations. I have two questions for the PhD student:

i. The thesis advocates the thesis of the predictive ability of capitalization yield in relation to inflation. How would you assess the impact of shock events (e.g. financial crises, pandemics) on the stability of this relationship and what approaches would you suggest to compensate for such effects in the model?

ii. In your analysis, you use the S&P 500 index as a measure of market returns. What features or potential limitations would you identify when applying your model to other capital markets, for example in Bulgaria or in other emerging economies?

9. Summary Conclusion and Evaluation:

The dissertation is an in-depth and original scientific research that successfully combines theoretical analysis and empirical verification. The author demonstrates a high level of analytical skills through the development of new models for forecasting inflation and estimating the capital market. Scientific and applied scientific contributions are clearly formulated and substantiated with the help of modern statistical tools. The results achieved contribute to the development of economic science, especially in the field of financial forecasting and welfare analysis. The dissertation meets all academic standards, quantitative and qualitative requirements for awarding the educational and scientific degree "Doctor".

The dissertation shows that the candidate has in-depth theoretical knowledge and a high capacity to conduct independent scientific research. I vote in a motivated "For" awarding the educational and scientific degree of "Doctor" to Vladislav Lyubomirov Lyubenov.

4/29/2025

Reviewer: ....

/Prof. Dr. Stoyan Prodanov/