

## REVIEW

From: **Prof. Dr. Stefan Hristov Petranov**, holding the position of "professor" at the Faculty of Economics at Sofia University "St. Kliment Ohridski"

Subject: dissertation work for awarding the scientific and educational degree "**Doctor**" in the professional field 3.8 Economics (Political Economy) at Sofia University "St. Kliment Ohridski".

Author of the dissertation: **Tanya Tsvetanova Karamisheva**

PhD thesis: **THE CREDIT AND FINANCIAL CYCLE IN BULGARIA AND ITS RELATION TO THE BUSINESS CYCLE AND MACRO-PRUDENTIAL POLICY**

Grounds for submitting the review: **Member** of the scientific jury for the defense of the dissertation according to Order RD 38-211 / 28.04.2021 of the Rector of Sofia University St. Kliment Ohridski.

### 1. Information about the author

Tanya Karamisheva is currently a Chief Expert in the Economic Research and Forecasting Directorate, Monetary and Financial Research Department of the Bulgarian National Bank (BNB). Her direct responsibilities include analyzes and forecasts of monetary and credit aggregates, interest rates, the development of the banking sector, as well as participation in the Bank's periodicals. Prior to joining the BNB, she also had an internship at Allianz Bulgaria Commercial Bank.

As an employee of the BNB, Tanya Karamisheva has passed a number of specializations and qualification courses in renowned institutions such as the International Monetary Fund, the central banks of Italy, Ukraine, France and Great Britain and others. During the period 2015 - 2019 she has been involved in ten international conferences organized by the European Central Bank and the central banks of Switzerland, France, Turkey, Belgium and others.

Tanya Karamisheva has a bachelor's degree in Industrial Economics from the University of National and World Economy. She also holds a bachelor's and master's degree in Business Administration from Julius-Maximilian University in Würzburg, Germany.



## **2. Assessment of the structure and content of the dissertation project**

In general, the considered project has the necessary characteristics of a dissertation in terms of volume and structure. At the same time, the relevance of the chosen topic of the dissertation is also clear, because the issues of evaluation of the parameters of the financial cycle and the business cycle are always on the agenda of macroeconomic analyzes. In addition, the dissertation examines these cycles from the point of view of macroprudential policy, which is especially relevant after the financial and economic crisis of 2008-2009, as well as in the current COVID19 crisis.

The proposed project is a completed and thorough scientific piece of research. The composition is consistently and logically connected between the individual parts, the results are highlighted clearly and precisely. Each chapter ends with a separate section summarizing the main results and conclusions, which facilitates their perception and is a good practice for such works. A declaration of originality and protocols of tests for possible plagiarism with a negative result are presented. A reference for fulfillment of the minimum national requirements under Art. 26 of ZRASRB is presented as well.

The object of the study in the presented project are the cyclical fluctuations in the financial system of Bulgaria for the period 1999-2019, measured by the deviation of a set of financial and macroeconomic indicators from their long-term trend. The relationship between these indicators and the cyclical fluctuations in the Real GDP is under investigation as well.

The subject of the study are the possibilities for using the assessment of the financial cycle in decision - making for the macroprudential policy.

The main hypothesis of the research is that "... it is possible by aggregation of information from various macroeconomic and financial variables to construct an aggregate measure of the financial cycle which is superior to the use of the commonly accepted simple measure – namely the deviation of the credit to GDP ratio from its long-term trend. With such an instrument it is possible to give timely and reliable signals for the accumulation of cyclical risks in the financial system."

Following the usual structure of dissertations, Chapters One and Two are introductory. Chapter One provides a detailed review of the scientific literature describing the relationships between lending and economic activity, as well as the literature concerning the assessment of credit, financial and business cycles. Here the author demonstrates in-depth knowledge of the theoretical formulations on which the relationships under study are based. Numerous sources from specialized literature have been used and cited, which shows high erudition on the topic of the dissertation.



Chapter Two analyzes the dynamics of the amount of credit to the private sector, as well as the BNB policy during the period under review. The text is informative and historically useful for raising the issues under consideration in the context of the Bulgarian economic reality.

The chapters from Third to Fifth are the core of the dissertation, as they essentially present the research performed by the author. In Chapter Three both macro and micro level factors for the dynamics of credit in Bulgaria are identified. Micro level factors are based on individual data from the survey on credit activity of banks, which to my best knowledge, is done for the first time in Bulgaria.

Chapter Fourth is dedicated to the estimation of the credit cycle and the business cycle in Bulgaria. The financial cycle estimation is based on two different approaches. First, through the measurement of the deviation of the Credit to GDP ratio from its long-term trend. And second, through the aggregation of information from a wide range of macroeconomic and financial indicators.

For assessment of the business cycle in Bulgaria a structural model with unobservable components is used. Technically the estimates are based on the method of maximum likelihood. A Kalman filter is used to decompose a set of observable variables to trend and cyclical component.

Subsequently the relationship and the degree of synchronization between the financial cycle and the business cycle are analyzed, as well.

Chapter Five synthesizes the results of the previous two chapters. It provides recommendations for the BNB's macroprudential policy based on the results and conclusions of Chapters Three and Four. An approach is proposed in which decisions on the size of the countercyclical capital buffer of commercial banks are made on the basis of the results of the assessment of an integrated indicator for the phases of the financial cycle, and not on the basis of deviations of the Credit / GDP ratio from its long-term trend.

Overall, it can be concluded that the dissertation provides scientific and applied solutions aimed at the mechanism of macro-prudential policy. The text shows that the author commands excellent knowledge of the existing theories and models in the research field. The constructed apparatus for research of the financial cycle and the performed analyzes show the abilities of the doctoral student to conduct independent researches and to interpret their results.

The results obtained are useful for macro-prudential policy and may have specific practical application. The demonstrated mastery of a difficult econometric analytical apparatus leaves a very good impression. The author handles it thoroughly, which shows that she has a serious fundamental econometric training.



Good impression leaves also the way data and results are presented. The results are repeatable and verifiable.

### **3. Identification and evaluation of scientific and applied contributions**

The proposed dissertation possesses primarily scientific and applied contributions. In my opinion, the most important of them are the following:

- A methodology for deriving an aggregate measure of the financial cycle has been developed and implemented. The result is one of the first trials for evaluation of the financial cycle in Bulgaria, which overcomes some of the conceptual limitations for the use of the deviation of the Credit / GDP ratio from its long-run trend as an indicator.
- Based on the developed methodology, the phases of the financial cycle in Bulgaria are estimated. The dynamics of the financial cycle is compared with the dynamics of the business cycle, obtained on the basis of a model with unobservable components.
- Proposed are analyzes and recommendations for making of macro-prudential policy related decisions with respect to the countercyclical capital buffer. This is possible because knowledge for the phase of the financial cycle, provides an opportunity for the identification of the most appropriate moments for the accumulation and release of capital buffers to stabilize the financial system.
- It is designed a specific econometric model and based on it factors for the dynamics of credit in Bulgaria are examined. The model operates on the macro level through the use of aggregate macro-economic indicators, while on micro level it operates through the use of data provided by individual commercial banks.

In assessing the contributions of the dissertation, one should also consider the publications of the author, which are related to individual parts of the dissertation. The presented list includes five publications, one of which is co-authored. All are in authoritative specialized publications.

### **4. Critical remarks and recommendations**

My only general remark to the presented research work is related to the heterogeneous nature of the data from the time series that are analyzed. The period under consideration is relatively short, but more importantly, it is characterized by significant structural changes.



The author is aware of this problem and comments on it in the Introduction as one of the limitations of the specific results obtained in terms of estimates of the length and amplitude of the financial cycle. But this problem also manifests itself in the calculation and interpretation of the long-term trend of the Credit / GDP ratio. In this case implicitly the author has adopted that long-term trend is one that is obtained based on the data ratio for the entire period. In my opinion, this is not appropriate because the period is very heterogeneous. At the beginning of the period, in 1999, the financial system was still experiencing the momentum of the biggest crisis in the history of the Bulgarian economy (1997), related to hyperinflation, closed banks and lost deposits. Privatization of state-owned banks and practically the entire real sector was forthcoming, there was no external lending, and investment activity was at a very low level. All this was reflected in a very low demand for loans and as a result the Credit / GDP ratio starts from a very low base, which is atypical and does not characterize the long-term trajectory of the economy. The inclusion of data from this initial period in the calculations for the long-run trend of the indicator Credit / GDP ratio distorts its theoretical performance and may compromise the usefulness of this indicator for making informed decisions.

This note does not belittle the achievements of the doctoral student in terms of the developed methodology for assessing the phases of the financial cycle. The note should rather be seen as a recommendation for future work. If the PhD student continues her research in this field, I think it will be useful in the analysis and interpretation of the Credit / GDP ratio to consider this feature.

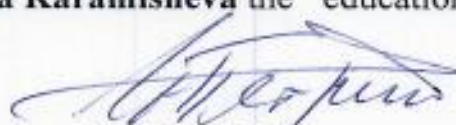
## **5. Questions to the doctoral student**

To better clarify the results obtained, I will suggest the PhD student to comment on Table 3.2. On it is shown that all the variables involved in the regression equation, are first order integrated. Although this conclusion is based on the extended Dickey-Fuller test and the Phillips - Perron test, in my opinion, the technical conclusion contradicts the economic theory for some of the variables. For example, real GDP is considered to be growing at a steady pace in the long run. This means that in the long run the first differences of this variable increase, and are not stationary, as would be the case if the variable is first order integrated. What could be the reason for this contradiction?

## **6. Conclusion**

Based on the above arguments, I consider that the proposed dissertation presents the results of completed research and meets the criteria and requirements laid down in Art. 64 of the Regulations for the conditions and procedures for acquisition of scientific degrees and appointment of academic positions at Sofia University " St. Kliment Ohridski. With this review I express my **positive opinion** for awarding **Tanya Tsvetanova Karamisheva** the educational and scientific degree "doctor".

June 28, 2021



Prof. Dr. S. Petranov: