

RESEARCH NEWSLETTER AT THE BANK OF ALBANIA

Contents

I. RESEARCH PAPERS	7
II. RESEARCH ACTIVITIES	8
III. LINKS OF OTHER INSTITUTIONS:	11

The 31st edition of the "Research newsletter in the Bank of Albania" presents the most recently concluded research papers, research work in progress, articles, and the main research activities organized mainly by Bank of Albania's economists in the course (2023 H2).

I. RESEARCH PAPERS

1.1 RECENTLY CONCLUDED RESEARCH PAPERS

The scientific research at the Bank of Albania during this period has been primarily oriented towards empirical materials and analyses. The research has focused on a wide range of topics including economic and financial integration, lending, financial situation of households, climate change and associated risks, monetary policy, and financial stability. A short summary is presented below.

"Prospects and challenges of monetary and financial development and economic integration for Kosovo-Albania economic cooperation in the framework of regional integration", by Gent SEJKO, Governor, Bank of Albania.

The economic and financial cooperation and integration between Kosovo and Albania is a natural development that is self-explanatory. However, it's crucial to

acknowledge the challenges and crises our region, partner economies, and the global economy have faced in recent decades. These circumstances further underscore the importance of strengthening the financial architecture and coordinating monetary policies to support economic integration. It is imperative for our countries to deepen financial integration and explore additional avenues for monetary and financial cooperation.

This material aims to provide an in-depth analysis of the current state and explore the prospects for cooperation and further financial and monetary integration between the economies of Albania and Kosovo within the framework of collaboration with other economies in the South-eastern European region. This study takes advantage of the best experiences from theoretical and empirical studies, as well as economic and financial data analysis, to explore the various options and benefits of integration. It suggests that, despite the different monetary regimes in our economies, there can still be monetary

cooperation in more general forms. This can range from informal policy consultations to coordination and cooperation in evaluating and forecasting monetary indicators and inflation. Additionally, the study delves into the potential for greater and faster integration of the financial architecture. This is not only driven by the presence of Albanian financial institutions in the Kosovo economy, but also by the processes of economic integration between our two countries. Furthermore, it considers the integration processes within the regional and European framework as well as the advancements in digital technology in the finance sector.

"In (re)search of credit crunch (rationing) periods in Albania", by Gerti Shijaku, Research Department, Bank of Albania

This paper analysis further a possible existence of the crisis episode (rationing) in the credit market in Albania, extending the focus also in the period during and after the pandemic Covid-19 crisis. For this reason, as before, the analysis is based on quarterly macroeconomic, banking sector and bank lending survey data for the period 2007-2023, while again the credit demand and supply is separated and evaluated through a dynamic model of disequilibrium of the bank loan market according to the standard VAR approach. The analysis also includes again the credit market for firms (and for individuals). The main results, both during the global financial crisis and the one related to the "Covid-19" pandemic crisis, do not support a relatively strong disequilibrium of the credit market in Albania that would be particularly related to credit crisis episodes. The results, however, provide evidence supporting the credit rationing hypothesis, both for firms and households, especially

before the pandemic crisis. Such episodes have been found to occur on both the demand and supply sides. Similarly, these episodes are found to last longer in the case of firms. At the same time, the degree of credit rationing is greater even in the case of firms.

"Evidence on household financial fragility in Western Balkan countries before COVID-19", by Elona Dushku, Research Department, Bank of Albania.

This paper seeks to investigate household financial fragility in Western Balkan countries using household-level data from the third wave of the Life in Transition Survey. We used the ability of households to cope with an unexpected expenditure shock as a measure of household financial fragility and analysed how socio-demographics and economic characteristics are related to the probability of households being financially fragile. Understanding household financial fragility in Western Balkan countries is important to properly address policy challenges in terms of household welfare and financial stability. Our findings show that almost half the households in the Western Balkans could not cope with an unexpected expenditure event and are considered financially fragile. Estimated results based on probit regressions show that the probability of Western Balkan households being financial fragile is, in addition to socio-demographic factors, related to households' portfolio choices.

A VECM approach Analysis of the long-run relationship of Credit demand and Credit supply of firms and households in the case of ALBANIA?, By Gerti Shijaku, Research Department, Bank of Albania.

This paper presents an empirical analysis of bank credit demand and credit supply in the case of Albanian small open economy, focusing particularly in the period after global financial crisis. Using macroeconomic and banking sector and those from bank lending survey data over this period, we disentangle credit demand and credit supply in the case of firms (and to households) by estimating a dynamic model of the Albanian credit market according to a market disequilibrium approach, upon which we analyse the existence of a long-run cointegration relationship. At the same time, the long run effect of explanatory variables on credit demand and supply is also analysed. The set of variables used to specify each model, including economic confidence and purchase power parity, liquidity conditions, opportunity costs and spreads, as well as those related to bank competition and prudential behaviour, and exchange rate movements, are all found to be integrated of order one (I) Cointegration was performed under Johansen test approach and a standard Vector Error Correction model approach was applied according to its result. Our model results point on the association between effects of variable on one another on both long and short runs, and an error-correction term derived from the known (estimated) long-run cointegrating relationship exists, in either case.

“Benefits and Costs of Integration Albania-Kosovo from the Perspective of Social Accounting Matrices and Macroeconomic Modelling”, by Altin TANKU, Research Department, Bank of Albania, Lorena SKUFI, Monetary Policy Department, Bank of Albania, and Esida BUJUPI, Ministry of Finance, Kosovo.

Kosovo and Albania are naturally in symbiosis, but macroeconomic statistics show that the relationship is not complete. The study aims to fill the gap in well-structured empirical studies that evaluate, analyse, and discuss the potential benefits of increasing the scale of integration. Taking advantage of the community of available data, empirical studies on economic modelling in Albania and Kosovo, Social Accounting Matrices, and macroeconomic models to simulate, the study evaluates the economic effects of Kosovo-Albanian integration. The results help to understand whether full economic and financial integration causes challenges or conflicts between the economic interests of each country and set a starting point for discussion based on formal econometric modelling.

“Does money matter for predicting overall prices in Albania? An analysis with recurrent neural network By Blerina VIKA, Statistics & Applied Informatics Department, Faculty of Economy, University of Tirana, Denada XHAJA, Department of Informatics, Faculty of Natural Sciences, University of Tirana”, by Ilir VIKA, Research Department, Bank of Albania

The purpose of this article is to assess the information content of monetary aggregates in predicting overall prices in Albania. The relevance of money is evaluated by comparing forecasts derived from no-money versus money-based models. Rather than employing traditional econometric models, an important innovation in our analysis is to use the Long Short-Term Memory (LSTM) technique of recurrent neural networks. These powerful tools allow higher flexibility than conventional functional forms for achieving the desired degree of forecast

accuracy. After estimating the neural network parameters on quarterly data from 1993 to 2016, the forecast performance is then evaluated in a pseudo out-of-sample exercise for horizons varying from one to twelve quarters ahead during the period 2017-2022. Results indicate that narrow monetary aggregates, particularly base money that is controlled by the central bank, play an important role on predicting prices at all horizons up to around two years. Contrary to many expectations, the contribution of broader monetary aggregates M2 and M3 is found unstable across time horizons. The LSTM model results also uncover time varying effects of monetary aggregates. We find evidence that the impact of money growth on overall price developments was weaker in the years before the pandemic, and it increased considerably during the accelerating inflation in the post-coronavirus and energy shock period. As it is the more recent period that matters for monetary policy, it is argued that money matters in the case of Albania (at least in particular economic circumstances) and due diligence should be dedicated to money-based price models.

“Growth-at-risk and Climate Change risks: An empirical analysis in the case of Albania”, by Gerti Shijaku, Research Department, Bank of Albania

Climate change poses significant risks to our planet, but it is crucial to recognise that these risks are not isolated from the realm of economic growth. As we strive to address these challenges, it is essential to understand among others also the complex relationship between climate change risks and economic growth, upon which Growth-at-Risk (GAR) approach provides an alternative methodology for understanding

how such risks and vulnerabilities contribute to the future episodes of weak economic growth. Using this approach, with Albanian macro-financial and climate change risk related data and a Quantile regression method, this paper show that the likelihood and severity related to downside ‘tail risk’ of future weak or negative economic growth in Albania will rises during periods where climate change risks are growing. The main advantage relies on the ability to assess and model volatility or the entire distribution of actual GDP growth (in contrast to point performance or mean growth), quantify climate change risks in terms of growth, and monitor the evolution of such risks to economic activity over time, upon which, from a scenarios approach, policymakers can quantify the likelihood of possible risk that would serve also as a basis means for pre-emptive actions.

1.2 RESEARCH PAPERS IN PROGRESS

“What explains the recent run-up in Albanian house prices? An analysis with the LSTM neural network”, by Blerina Vika, Statistics & Applied Informatics Department, Faculty of Economy, University of Tirana, Ilir Vika, Research Department, Bank of Albania

Housing prices in Albania have grown rapidly for about six years in a row, before and after the pandemic. Naturally, this has fuelled heated debate as to whether the recent run is based on sustainable factors or it has reached a tipping point that requires significant decision-making. This research work aims to identify the economic, financial and demographic indicators that have recently influenced the rapid development

of house prices in Albania. This should help policy makers in the analytical process and in legitimizing their decision-making.

The analysis uses the Long Short Term Memory (LSTM) neural network method, which is part of the exciting new machine learning techniques. The architecture of the neural network is very important. For this reason, we have tried to contribute to the literature on the optimal number of hyper parameters that are selected in order to build a satisfactory structure of the neural network, by testing a significant number of inputs (2, 4, 8, 16 quarters), the number of hidden layers (1-4), and the number of their neurons (16, 32, 64, 128, 256, 512, 1024). Keeping the number of neurons in each hidden layer equal, we test 112 candidate models with different LSTM structures.

The set of indicators considered for this empirical analysis includes real house price, real per capita income, real estate bank lending, real estate investment from non-residents, real house rent, the real two-year bond interest rate, the real cost of construction, the change in the urban population, and the area of permits for the construction of new housing. To test their driving role on housing prices, we used the SHAP values calculated over the 5 LSTM models that provide the best forecast ability in the two-year horizon over the period 2017Q1-2023Q2.

Preliminary results evidence an important role of theoretically-driven indicators, by providing valuable information that helps to improve the predictions obtained from a univariate autoregressive model. A comparison of the impact of the variables in the model forecast according to the SHAP

value highlights that the past house price developments and per capita income are the most essential factors for explaining the rapid house price increase in recent years. Other factors determining housing prices may include non-resident purchases, bank lending, construction costs, and interest rates. Contrary to some perceptions, rents and demographic movements are presented with rather low influence as suggested by SHAP.

“Assessing financial fragility of Albanian households”, by Elona Dushku, Research Department, Bank of Albania

Using data from the first wave of the Household Wealth Survey in Albania, this material aims to investigate the financial fragility of Albanian households and explore how socioeconomic characteristics and household portfolio composition relate to a household's probability of being financially fragile. Understanding the financial fragility of households in Albania is important to properly address policy challenges in terms of family well-being and financial stability. Albania represents a special case in terms of portfolio composition, given the high level of home ownership, low level of debt and portfolio diversification reported by the survey data. Financially fragile households are defined as those households that are able to meet expected expenses, but do not have sufficient liquidity to meet unexpected expenses (Bruneti et al., (2012)). The data show that 60% of Albanian households are financially fragile, and the probability of being financially fragile is negatively related to the level of education, income and possession of a second real estate and positively to the existence of having a consumer loan.

“Albania in Figures”; 1944-1990”, by Fiqiri BAHOLLI, Research Department, Bank of Albania

Examining the economic developments in Albania from 1944 to 1990, which aligns with the centralized economy period, provides valuable insights. The analysis is based on a wide database sourced from the State Archives and statistical publications stored in the National Library. With such rich and reliable data, the study can thoroughly analyse this period in terms of money and banks.

“From Skies to Markets: Exploring macroeconomic and financial implications of extreme weather events in the CESEE region”, by Meri Papavangjeli and Margarita Topalli, Research Department, Bank of Albania

This study explores the financial and macroeconomic implications of extreme weather events on Central Eastern and South-Eastern European countries. As climate change increases the frequency and severity of these events, it is crucial to understand their impact on economic growth, price levels, and financial stability. Using vector autoregressive analysis, our research explores data from 2000-2022, highlighting the significant role that the weather conditions play in influencing these critical macroeconomic and financial aspects. Notably, we find a significant contraction in GDP, increased vulnerability in financial systems, and inflationary pressures following extreme weather events. Our findings underscore the need for central banks and financial regulators to incorporate climate-related risks into their monetary and financial stability frameworks. By exploring the state of climate and biodiversity

finance, this paper provides insights into how these tools can aid in transitioning to a low-carbon economy and promote the protection of ecosystems, species, and genetic diversity. This study ultimately seeks to empower decision-makers to proactively address these challenges and foster more resilient and sustainable economies.

“Financial literacy of adults in Albania: Results of the 2023 round”, by Elona DUSHKU, Arlinda KOLENIÇO, Egnis ISAKU, Research Department, Bank of Albania

This paper presents the results of the Survey of the Financial Literacy of Adults in Albania, conducted by the Bank of Albania, over the course of 2023. The data show that financial literacy score of adults in Albania for the year 2023 is 59 out of 100 (maximum level). Compared to the average of the 39 countries that participated in the fourth round of the survey organized by the OECD, as well as the OECD countries themselves, the financial literacy score in Albania is 1.6 and 4 points lower, respectively. Individuals in Albania have a lower level of financial knowledge and behaviour compared to the average of other countries, but have a higher level of financial attitudes. However, compared to the data of the third round developed in 2019, we have an improvement in average terms of both behaviour and financial knowledge.

1.3 ARTICLES BY OTHER CENTRAL BANKS

“Hawks vs. Doves:” ECB’s Monetary Policy in Light of the Fed’s Policy Stance”, by Niko Hauzenberger, Florian Huber, Thomas O. ZÖRNER, Oesterreichische Nationalbank (OeNB)

The secular increase in globalization led to a substantial increase in the interconnectedness of global financial markets. This has important implications for the conduct of monetary policy, as central bank policies may diverge across countries, potentially affecting key transmission channels of domestic policy actions. In this paper, we use a non-linear multivariate time series model to shed light on how the US monetary policy stance affects the conduct of monetary policy in the euro area. Scenario-specific impulse responses show that the transmission of euro area monetary policy through financial markets does indeed depend on the prevailing monetary policy regime of the Federal Reserve and has significant effects on a variety of euro area variables.

<https://www.oenb.at/en/Publications/Economics/Working-Papers.html>

“A Field Guide to Monetary Policy Implementation Issues in a New World with CBDC, Stablecoin, and Narrow Banks”, by James A. Clouse, Federal Reserve

This paper develops an analytical framework aimed at shedding light on the implications of the evolution of financial market structure for monetary policy implementation and transmission. The basic model builds on that developed in Chen et. al. (2014) which, in turn, draws inspiration from the pioneering work of Tobin (1969) and Gurley and Shaw (1960). The paper focuses, in particular, on the implications of introducing new types of fixed-rate financial assets in the financial system including retail and wholesale central bank digital currency (CBDC), stable coins issued by narrow nonbanks, and deposits issued by narrow banks. The analysis also provides a crude way of capturing some

of the effects of bank capital and liquidity regulation on financial intermediation and monetary policy implementation. Perhaps the most important conclusion is that the introduction of new fixed-rate assets by the Federal Reserve or by other financial intermediaries can have significant effects on equilibrium interest rates and patterns of financial intermediation and may also affect the potency of monetary policy tools. These effects are most pronounced when new financial assets are close substitutes for existing financial assets.

<https://www.federalreserve.gov/econres/feds/a-field-guide-to-monetary-policy-implementation-issues-in-a-new-world-with-cbdc-stablecoin-and-narrow-banks.htm>

“Rapid and Monetary-fiscal policy interactions when price stability occasionally takes a back seat”, by Sebastian Schmidt, European Central Bank (ECB)

I address this question in a dynamic stochastic sticky-price model with endogenous shifts between an “orthodox” and a “fiscally dominant” policy regime. What are the macroeconomic consequences of a government that is limited in its willingness or ability to raise primary surpluses, and a central bank that accommodates its interest-rate policy to the fiscal conditions?

The risk of future regime shifts has encompassing effects on equilibrium. Inflation is systematically higher than it would be if fiscal policy always adjusted its primary surplus sufficiently and monetary policy was solely concerned with price stability. This inflation bias is increasing in the real value of Government debt. Regime-switching probabilities are not invariant to

policy. The central bank can attenuate the risk of a shift to the fiscally-dominant regime by raising the real interest rate sufficiently moderately when inflation increases. Lower fiscal dominance risk, in turn, mitigates the inflation bias.

<https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2889~b14c2f4ff1.en.pdf?dcca2393ecfb37818e4298f96143f5>

“Fintech vs bank credit: How do they react to monetary policy?”, by Giulio Cornelli, Fiorella De Fiore, Leonardo Gambacorta, Cristina Manea, *Bis*

Fintech credit, which includes peer-to-peer and marketplace lending as well as lending facilitated by major technology firms, is witnessing rapid growth worldwide.

However, its responsiveness to monetary policy shifts remains largely unexplored. This study employs a novel credit dataset spanning 19 countries from 2005 to 2020 and conducts a PVAR analysis to shed some light on the different reaction of fintech and bank credit to changes in policy rates. The main result is that fintech credit shows a lower (even non-significant) sensitivity to monetary policy shocks in comparison to traditional bank credit. Given the still marginal – although fast growing – macroeconomic significance of fintech credit, its contribution in explaining the variability of real GDP is less than 2%, against around one quarter for bank credit.

<https://www.bis.org/publ/work1157.htm>

2. RESEARCH ACTIVITIES

2.1 FRIDAY SEMINAR

The following seminars took place in the period July-December 2023:

- The seminar on **“The challenges of financial stability and monetary policy in the post-pandemic era”**, Prof. Dimitrios TSOMOCOS, professor of Financial Economics at the University of Oxford, SAïD Business School and researcher in Management at St. Edmund Hall; Charles A.E. Goodhart, M. Udara Peiris, Xuan Wang, September 2023

The COVID-19 pandemic has led to a significant increase in debt across various sectors. While there has been a lot of focus on the growth of public debt and its policy

implications, the growth of corporate debt has received less attention. The authors of the study argue that high levels of corporate debt can actually hinder the transmission mechanism of monetary policy make it less effective in controlling inflation. This means that when firms have a substantial amount of debt, the impact of higher nominal interest rates on their income can outweigh the usual negative effect on aggregate demand. This effect becomes even more significant in an environment where firms require working capital financing. This mechanism operates independently of standard financial and nominal frictions, and it exacerbates the trade-off between inflation and output stabilization.

- The seminar on **“In (re)search of credit crunch (rationing) periods in Albania:**

An Imbalance Approach", Gerti SHIJAKU, Research Department, Bank of Albania, November 2023.

The paper presents an empirical analysis of the credit market in Albania, specifically focusing on the period after the global financial crisis. The study utilizes macroeconomic data, banking sector data, and a survey of lending activity to examine the dynamics of the Albanian bank loan market. Using a standard VAR approach, the authors evaluate a dynamic imbalance model to separate the demand and supply of credit. The analysis includes the bank loan market to firms (and households). The main findings suggest that there is no significant credit market imbalance in Albania, particularly in relation to credit crunch episodes. However, the results do support the hypothesis of credit rationing for both firms and households.

2.2 SEVENTEENTH SOUTH-EASTERN EUROPEAN ECONOMIC RESEARCH WORKSHOP

On 4-5 December 2023, the Bank of Albania organized the 17th SEE Economic Research Workshop of Southeast Europe. This workshop organized as a discussion forum on the research works and projects conducted over 2023, aims at promoting the exchange of views among researchers from the Bank of Albania, other central bankers, academia, and scholars and policy-makers in the region and beyond on the outcomes and implications of scientific research in relation to central bank activity.

Over the course of the two-day event, a total of 37 study materials were presented and discussed, with 9 of them authored by employees of the Bank of Albania. The

topics covered in these materials were aligned with the challenges faced by central banks worldwide, such as inflation, monetary policy, financial stability, as well as contemporary issues like climate change, digitalization, household finances or financial inclusion. To find out more, please refer to the program and the authors' presentations in the link below:

https://www.bankofalbania.org/Publications/Research/Regional_research_meeting_in_South-east_Europe.html

2.3 GOVERNOR'S AWARD FOR THE BEST DIPLOMA THESIS 2023.

In the 2023 open competition for the "Governor's Award for the best diploma" a total of 26 students participated. They focused on subjects that related to central banks and various phenomena in the field of economics. The Bank of Albania has been organizing this prestigious competition for over a decade, aiming to promote and encourage students, both domestically and internationally, to engage in high-quality scientific research within the realm of economics.

In this year's competition, first prize was awarded to **Aurora Kapo**, from VanAmsterdam University, Netherlands, for her thesis on: "Descriptive Economics: Central bank communication and expected inflation"; the second prize was awarded to **Virjosin Stafasani**, from the Greenwich University, England for his thesis on: "The relationship between market efficiency, expected returns and volatility in the stock market"; the third prize was awarded to **Krista Kozmai**, from European University of Tirana, for her thesis on: "Fear" of the free

exchange rate - The case of Albania".

2.4 PARTICIPATION IN OTHER ACTIVITIES

- Presentation on "Albanian Household Wealth Survey (AHWS): Results from the first wave", by Elona DUSHKU, Research Department, at the seminar organized by Padata Western Balkan, on October 2023. This report summarizes the main findings from the first round of the Albanian Household Wealth Survey, conducted by the Bank of Albania in early 2019. The survey's primary objective was to gather comprehensive individual data on Albanian households, with a specific focus on assessing their wealth and its key components.
- Presentation on "Benefits and costs of integration between the economies of Albania and Kosovo in the perspective of social accounting matrices and macro econometric modelling", was delivered by Altin Tanku from Research Department (BOA), Lorena Skufi from Research Department (BOA), Esida Bujupi from the Ministry of Finance, Kosovo. This presentation took place during the joint international scientific conference on "Challenges and prospects of economic cooperation Kosovo-Albania and the Region," which was held on October 6-7, 2023. The conference was organized by the Academy of Sciences and Arts of Kosovo (ASAK) and the Academy of Sciences of Albania (ASA). The meeting brought together economists from academia and central banks, who focused on the economic integration of Kosovo and Albania.
- Presentation of Bank of Albania's Strategy on Financial Education and Inclusion and the "Results from IV round on financial literacy survey of adults in Albania, 2023". by Altin TANKU, Elona DUSHKU, Arlinda KOLENIÇO, Egnis ISAKU, Research Department, at the 9th annual meeting of the National Payment System Committee, organized by the Bank of Albania, on December 13, 2023. The presentation provided a brief summary of the Bank of Albania's Strategy on Financial Education and Financial Inclusion, as well as presented evidence on the financial literacy of adults in Albania, in terms of knowledge, behavior and financial attitudes. A summary of the presentation is available at the link below:

https://www.bankofalbania.org/rc/doc/6_Rezultate_te_vrojtimet_te_kultures_financiare_Tanku_Altin_25976.pdf

3. LINKS OF OTHER INSTITUTIONS

Banca d'Italia

<http://www.bancaditalia.it/studiricerche>

Bank of Canada

<http://www.bankofcanada.ca/research/>

Banco de Espana

<http://www.bde.es/informes/be/docs/docse.htm>

Bank of England

<http://www.bankofengland.co.uk/publications/workingpapers/index.htm>

Bank of Finland

http://www.bof.fi/en/julkaisut/bofit_julkaisut/index.htm

Bank of Greece

<http://eng.bankofgreece.gr/en/publications/research.asp>

BIS Central Bank Research Hub

<http://www.bis.org/cbhub/index.htm>

Czech National Bank

<http://www.cnb.cz/en/research/>

Deutsche Bundesbank

http://www.bundesbank.de/vfz/vfz_diskussionspapiere_2009.en.php

European Central Bank

<http://www.ecb.int/home/html/researcher.en.html>

Federal Reserve

<http://www.federalreserve.gov/econresdata/default.htm>

International Journal of Central Banking

<http://www.ijcb.org/>

National Bureau of Economic Research

<http://www.nber.org/>

International Monetary Fund

<http://www.imf.org/external/pubind.htm>

Oesterreichische Nationalbank

http://www.oenb.at/en/presse_pub/research/research.jsp