RESEARCH NEWSLETTER AT THE BANK OF ALBANIA

Contents

The 30th issue of the publication "Research Newsletter at the Bank of Albania" reflects on some of the recently completed and in process research papers and publications, as well as the main research activities carried out by Bank of Albania's economists during the 1st half of 2023.

I. RESEARCH PAPERS

1.1 RECENTLY CONCLUDED RESEARCH PAPERS

Scientific research activities at the Bank of Albania, during this period, were oriented towards empirical research and analyses with a focus on topics related to climate change and green finance, monetary policy, financial stability, household behaviour, big data methodologies and artificial intelligence, etc. Summaries are presented below.

"Evidences on households financial fragility in Western Balkan countries before Covid-19", *Elona Dushku, Research Department (BoA).*

This paper uses households' level data from the third wave of Life in Transition Survey to investigate household financial fragility in Western Balkan countries, prior to the pandemic crisis caused by Covid-19. We measured household financial fragility, as the ability of households to cope with unexpected expenditure shock, and we 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 of households in Western Balkan are unable to cope with an unexpected expenditure event, thus are considered financially fragile. Estimated results based on Probit regressions show that the probability of households being financial fragile in Western Balkan, besides sociodemographic factors, is related with household portfolio choices, which play an additional role on household financially fragility.

"Climate Risks in Albania and their Relevance to the Central Bank", *By Margerita Topalli, Research Department, Bank of Albania) and Pierre Monnin, Economist, Council on Economic Policies – CEP).*

Climate change is and will increasingly weigh on businesses and households in Albania. To mitigate these costs, important structural transformations are necessary to position the Albanian economy on a sustainable path. This goes together with significant investments in adaptation and mitigation infrastructures. Achieving this goal requires the involvement and coordination of all private and public institutions, including the Bank of Albania (BoA). First, the BoA must adapt its monetary policy to this economic context to account for climate shocks and deliver the conditions supporting the transition. Second, as a banking supervisor and regulator, the BoA must ensure that the financial institutions can withstand climate risks and provide adequate funding to the economy in the transition. Third, like any other financial institution, the BoA must keep the climate risks for its balance sheet in check. This report describes the challenges that climate change and the transition pose to the BoA, as well as the policy options available to the central bank to account for climate issues in its monetary policy and its financial supervisor's duties. It concludes with a policy roadmap for the BoA to rapidly account for climate issues across all its activities.

"Forecasting house prices in Albania with the deep learning LSTM network",
Blerina Vika, Statistics & Applied Informatics Department, Faculty of Economy, University of Tirana, Ilir Vika, Research Department, Bank of Albania

This article investigates the role of economic, financial and demographic indicators in forecasting house prices in Albania. The pool of variables is drawn from empirical studies for advanced and developing countries. To test their importance, we employ the long short-term memory network from the machine learning techniques. As the time span of observations is rather limited, the specification of models is maintained to be parsimonious and sufficient to capture the most important dynamics. As such, we compare the performance of a univariate network with models containing the most related variables such as GDP and actual rental, and then augment them with bank loans and interest rates, demand from non-residents, unemployment rate, urban population, cost of construction, and area of building permits. The forecast ability is evaluated during the 2018-2022 period for horizons at 1, 4, 8 and 12 quarters ahead. Preliminary results suggest that multivariate, theory-driven models can help improve upon forecasts generated from the univariate network. Apart from the gross domestic product and rentals, costs of construction and financial indicators are some additional variables in which forecasters may have confidence when predicting residential house prices in Albania.

"The Interplay between Credit Dynamics and Macro-financial Vulnerabilities: A Thorough Analysis of Financial Shocks and Policy Implications", *by Meri Papavangjeli, Research Department*

In the light of the current global developments, where economies worldwide are facing the challenge of rising inflation in the context of tightening global financial conditions and major macro-financial vulnerabilities, monitoring of financing conditions takes a greater importance in assessing the monetary policy transmission process and determining the appropriate monetary policy stance. This article contributes to the literature on several ways: first, it introduces a financial

conditions index (FCI) for Albania in line with IMF's approach (that captures structural economic changes and can also be used for multi-country analysis) and in addition, it examines the role of vulnerabilities in the financial sector in defining the transmission of financial conditions and monetary policy shocks to the real economy, by capturing also nonlinearities in these relations. Higher financial imbalances make the Albanian economy more vulnerable to shocks. The transmission of financial and monetary policy shocks to the real economy depend nonlinearly on nonfinancial credit to GDP gap as a measure for financial vulnerabilities. During periods of low vulnerabilities, a monetary tightening lead to a decrease in economic output and prices, and a credit contraction. In the contrary, when vulnerabilities are high, monetary policy is less effective. These results emphasize the importance of incorporating macroprudential policies to supplement the effectiveness of monetary policy in managing financial vulnerabilities. Specifically, the findings suggest that macroprudential policies can play a critical role in addressing high financial vulnerabilities, when monetary policy may be less effective. Therefore, policymakers should consider the complementarity of these two policy tools and adopt a comprehensive policy framework that involves both monetary and macroprudential policies to maintain financial stability.

1.2 RESEARCH PAPERS IN PROGRESS

"Albania in Figures", by Fiqiri Baholli, *Research Department (BoA).*

The publication's aim is to analyze banking activities during the 1944-1990 period

in Albania, in the context of production and service activities' coordination of a planned economy with many restrictions in foreign relations. A data research has been conducted to see what data regarding this period exists, what is missing, and whether it can be completed.

"Inflation and the impact on assets and profitability of the banking system" by *Pranvera Rrokaj, Research Department (BoA).*

This paper aims to analyse the impact of the world's latest economic and financial developments on the Albanian economy and banking system. More precisely, the scope of this material is to assess the effect of the inflationary trend on the interest rates and banks' asset valuation, as well as the presence of sensitivity factors and similarities with the current challenges faced by several banks in the developed economies. During the course of the material, bank's solvency as well as factors affecting profitability and liquidity will be analysed, by performing also a comprehensive comparison to similar economies. The paper also includes a sensitivity analysis of the price/valuation volatility for several asset classes depending on the changes applied in interest rates.

1.3 RESEARCH ARTICLES

"Per-meter-squared housing rentals' progressions in Tirana, as well as coastal and inland areas of Albania, during the 2017-2022 period", by Orion GARO, *Research Department (BoA).*

Because of a mutual and inseparable relationship to residential property prices, housing rentals are an important component of real estate market dynamics. This research

report analyses the per-meter-squared rentals in Tirana, as well as those in coastal and inland areas of the country during the last 6 years. Its objective is to estimate the rentals' averages by geographic location, and to observe their progressions over time. The data used for the analysis and its calculations are of the micro type, collected electronically through web scrapping methods and big data congregation tools. Among the main results of the research, we highlight the current average rent per square meter in Tirana, which is 675 Lek, and the corresponding averages for the coastal and inland areas are 475 and 450 Lek, respectively. A fact worth highlighting is that the trend of rentals in inland areas of Albania, making up the largest inhabitation expanse of the country, shows a slight downward trend from 2017 to 2020.

"Migration challenges and demographic developments in Albania", by Lindita Molishti, Research Department (BoA).

In consideration of recent migratory trends, this analysis aims to raise questions about the country's current economic model and promote reformulations and perspectives that will inevitably require important structural changes to face this new challenge that Albania is expected to face. The available data (from INSTAT 2021 and Eurostat (2021) show us that the Albanian population has recorded a further decline. The study analysis presents the latest migratory trends and demographic developments of the Albanian population. The characteristics of Albanian migration, as well as the negative effects that accompany this migration trend have been analysed. The paper presents the data supporting the possible reasons for migration, how these reasons have changed over time, and the macroeconomic

drivers behind these reasons. Some of the future challenges of the depletion of human capital in the labour market are identified, and a need for structural changes, for a qualitative transformation of the labour market, to minimize the negative effects of human capital depletion is recognized.

RESEARCH PAPERS FROM OTHER CENTRAL BANKS

"MPC Heterogeneity and the Dynamic Response of Consumption to Monetary Policy" by Miguel Ampudia, Russell Cooper, Julia Le Blanc, Guozhong Zhu, (Bank for International Settlement.

This paper studies how household financial choices affect the impact of monetary policy on consumption. Based on micro data from four major euro area countries, we estimate structural parameters to match moments related to asset market participation rates, portfolio shares and wealth-to-income ratios by education and country. The country specific distributions of the marginal propensity to consume out of income and financial wealth are not degenerate, reflecting, among other factors, costs to both asset market participation and portfolio adjustment. Due to the heterogeneity in consumption responses, monetary policy, operating through its effects on household income and asset market returns, has a differential impact on individuals within and across countries. Generally, poor households respond more to the income variations produced by monetary policy innovations, while rich households respond more to policy-induced variations in stock returns. Monetary policy has a larger impact on consumption in Italy and Spain compared to France and Germany. An extension of the model linking mortgage

payments to monetary policy strengthens these findings.

https://www.bis.org/publ/work1102.pdf

"SHOULD INEQUALITY FACTOR INTO CENTRAL BANKS' DECISIONS?" *by Niels-Jakob H. Hansen*, Alessandro Lin and Rui C. Mano, (Bank of Italy)*

The significant increase in inequality in recent decades has sparked a wide debate on the possible implications for monetary policy. This paper uses a dynamic stochastic general equilibrium (DSGE) model with heterogeneous agents to evaluate the implications of consumption inequality for the conduct of monetary policy.

The optimal monetary policy that takes redistributive considerations into account reduces consumption inequality to a relatively small extent and at the cost of increased output gap volatility. Conversely, monetary policies that are based on the Taylor rule (which, by design, yields generally worse welfare outcomes) and incorporate an inequality reduction target in their formulation, may lead to a significant drop in inequality and a decrease in inflation and output gap volatilities.

https://www.bancaditalia.it/pubblicazioni/temi__discussione/2023/2023-1410/en_tema_1410.pdf?language_id=1

"The pass-through from inflation perceptions to inflation expectation", *by Stefanie J. Huber, Daria Minina, Tobias Schmidt, (Bundesbank)*

This paper documents a strong relationship between households' perceptions about inflation over the past 12 months and households' short- and long-term expectations about future inflation. This relationship is strong during periods of high-inflation but even stronger during low inflation periods. We establish a causal relationship by implementing a randomized information provision experiment in a large and representative survey to generate an exogenous variation in inflation perceptions. Our results show that household perceptions about past inflation drive their expectations about future inflation rates. The strength of the pass-through from perceptions to expectations varies across socioeconomic groups. We identify two critical moderating factors for this heterogeneity: differences in individual uncertainty about future inflation and information acquisition. Further, we show that the large majority of households rely on their shopping experience when forming their perceptions about past inflation and pay particular attention to food and fuel prices. The shopping experience affects inflation expectations indirectly—through perceptions.

https://www.bundesbank.de/resource/blob/902668/365682610f6c37a512c5905f66f8f285/mL/2023-06-30-dkp-17-data.pdf

"FinTech, investor sophistication and financial portfolio choices" *by Leonardo Gambacorta, Romina Gambacorta, Roxana Mihet (Bank for International Settlement).*

This paper analyses the links between advances in financial technology, investors' sophistication, and the composition and returns of their financial portfolios. We develop a simple portfolio choice model

under asymmetric information and derive some theoretical predictions. Using detailed microdata from Banca d'Italia, we test these predictions for Italian households over the period 2004-20. In general, heterogeneity in portfolio composition and in returns between sophisticated and unsophisticated investors grows with improvements in financial technology. This heterogeneity is reduced only if financial technology is accessible to everyone and if investors have a similar capacity to use it.

https://www.bis.org/publ/work1091.htm

II.RESEARCH ACTIVITIES

2.1 THE 16TH SOUTH-EASTERN EUROPEAN ECONOMIC RESEARCH WORKSHOP

During the January-June period of 2023, the following seminars were held:

- On the topic: **"The impact of announcements from the central bank on financial markets"**, by Mr. Michele Modugno, Chair of Financial and Macroeconomic Stability Studies, at the Board of Governors of the Federal Reserve System (FED).
- The presented content delivers an analysis of the institutional elements of US banks stress testing, with the various elements of information that market participants receive when stress test results are made public. Examining the reaction of various asset prices, the study results show that market participants value stress announcements, not only for the information they provide about potential future capital distribution, but also as indicators of bank resilience. Also, these results support the use of stress tests by central banks, so as to inform the general public about the health of the banking system.

- On the topic: **"Sustainable finance:** current and future challenges"**, Dr. Anjeza Kadilli, Lecturer of Finance at the University of Geneva, Switzerland, May, 2023.
- The presented content's purpose was to address the latest facts and trends in the framework of sustainable investment, based on ESG criteria (Environmental, Social, Government), both at a global and a country level, mainly for Switzerland. Undoubtedly, in this regard, regulations and data based on standardized methodologies play a special role in determining sustainable investments. The presented content also addresses the impacts of the current transition in the economy, in three main directions, being: (i) the intensive use of metals versus energy, (ii) the risk of higher inflation, as well as (iii) the importance of innovation.
- On the topic: **"Awareness of climate change, impact and adaptation strategies - The case of the Albanian Agriculture Sector"** by Mr. Edvin Zhllima and Mr. Drini Imami, Associate Professors and lecturers at the Agricultural University of Tirana, Faculty of Economics and Agribusiness.
- The presented content forwards an analysis on the adaptive capacity and risk from climate change in Albania,

based on a survey with experts of the public advisory service for agriculture. Over the last few years, respondents have identified above average level increases of drought durations and temperature changes, higher frequencies of floods, untimely precipitations and frosts. Also, experts claim that there is a high negative impact of climate change on agriculture, therefore measures must be taken to adapt to future climate shifts.

- On the topic: **"The impact of recent developments in the construction sector and the real estate market: Data on price trends and economic and social impact"**, by Mr. Enkelejd Musabelliu, Adriatica RC Company.

  The presented content delves into the defining the latest developments on the construction sector and the real estate market. The study also tries to answer questions such as: How effective are existing housing programs and municipal housing plans? What are the possible consequences of the implementation of the new property tax?

2.2 PARTICIPATION IN OTHER ACTIVITIES

- Presentation, by Elona Dushku, Research Department (BoA), of the content on **"The financial fragility of families in the countries of the Western Balkans prior to COVID-19"**, at the 2nd Workshop on the Comparative Economy of Southeast Europe: Investment in Economic and Social Infrastructure, held by LSE (London School of Economics) in collaboration with the University of Belgrade, on March 30-31, 2023.
- The content, based on data from the third wave of **"Life in Transition (EBRD, 2016)"** survey, shows that nearly half of the families in the Western Balkans are financially unable to afford an unexpected expense. Research results reveal that the probability of families being financially weak is negatively correlated with the level of income, education, financial inclusion and owning real estate.

- Presentation, by Meri Papavangjeli, Research Department (BoA), of the content on "Assessing the effects of demographic shifts on the Albanian economy", in a virtual meeting with representatives of the Bank of Colombia, within the framework of the BCC (Bilateral Assistance and Capacity Building for Central Bank) program, as part of the cooperation agreement between the Bank of Albania and the Swiss State Secretariat for Economic Affairs (SECO).

  Demographic changes may have important implications for monetary policy, especially when nominal interest rates are on the zero lower bound. This paper simulates Gertler's model with time-varying demographics, constant productivity growth and fiscal variables, in order to quantify the impact of demographic change on real interest rates and to investigate the response of macroeconomic variables to demographic shocks. Empirically, a calibrated version of the model is utilized to discuss a number of macroeconomic scenarios for the Albanian economy within a horizon of around 20 years and even 100 years, using the UN projections for certain demographic indicators. The main finding of the paper is that demographic changes have contributed slowly over time to a

decline in the equilibrium interest rate, and their effects are supposed to carry on in the coming years, which might call for monetary policy reactions in order to dampen their adverse effects on several economic indicators.

2.3 CALL FOR PARTICIPATION IN THE 17TH SOUTH-EASTERN EUROPEAN ECONOMIC RESEARCH WORKSHOP

On December 4 and 5, 2023, the Bank of Albania will organize in Tirana, the 17th South-Eastern European Economic Research Workshop. This workshop aims to provide a discussion forum for research works on issues related to the central banking and to promote the exchange of views between researchers of the Bank of Albania, central banks of the region and beyond, as well as local and foreign financial and academic institutions.

Interested authors are invited to participate through their research studies, by submitting an extended abstract or the full study, by October 2nd, 2023, to the email address: BoAresearchworkshop@bankofalbania.org. For further details refer below: "17th South-Eastern European Economic Research Workshop", (in English).

https://www.bankofalbania.org/Press/ Press_Releases/Call_for_papers_17th_South-Eastern_European_Economic_Research_ Workshop_4-5_December_2023_Tirana_ Albania.html

III.   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)