



The 5th International Conference on Agriculture and Life Sciences of Albania 2030

3 – 5 November 2025
Agricultural University of Tirana, Kodër-Kamëz, Tirana

PROCEEDINGS



**The 5th International Conference
on Agriculture and Life Sciences of Albania 2030**

Tirana, 3-5 November 2025

PROCEEDINGS

PROCEEDINGS OF INTERNATIONAL CONFERENCE ON AGRICULTURE AND LIFE SCIENCES OF ALBANIA 2030 (ICOALS 5)

© Agricultural University of Tirana

All rights reserved. No part of this Proceedings book might be reproduced by any means - graphic, electronic or mechanical - without prior written permission of the Authors, according to the copyright.

Organised by:



Conference partners:



CONFERENCE CHAIR

Dr. **Fatbardh SALLAKU**, *Rector of Agricultural University of Tirana, Albania*

Dr. **Hubert HASENAUER**, *BOKU-University of Natural Resources & Life Sciences, Vienna, Austria*

CONFERENCE CO-CHAIR

Prof. Dr. **Erinda LIKA**, *Vice Rector of Science and Projects, Agricultural University of Tirana, Albania*

ORGANIZING COMMITTEE

Prof. Asoc. **Romina KOTO**, *Vice Rector, Agricultural University of Tirana, Albania*

Prof. Dr. **Ilir KAPAJ**, *Vice Rector for Teaching, Agricultural University of Tirana, Albania*

Prof. Dr. **Endrit KULLAJ**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Seit SHALLARI**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Remzi KECO**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Rezart POSTOLI**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Elvin TOROMANI**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Kapllan SULAJ**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Daniel MULLER**, *LAMO, Germany*

Prof. Asoc. **Valbona HOBDAI**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Anila HODA**, *Albanian Academy of Sciences, Albania*

Prof. Dr. **Gjokë ULDEDAJ**, *Rector of Qiriazi University, Albania*

Prof. Dr. **Ferdi BRAHUSHI**, *Agricultural University of Tirana, Albania*

Prof. Asoc. **Fatmir GURI**, *Agricultural University of Tirana, Albania*

Prof. Asoc. **Shpresim DOMI**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Evan RROÇO**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Etleva DELIA**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Ardian MACI**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Vath TABAKU**, *Agricultural University of Tirana, Albania*

Dr. **Alketa GREPCKA**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Etleva DASHI**, *Agricultural University of Tirana, Albania*

Prof. Asoc. **Dritan LACI**, *Agricultural University of Tirana, Albania*

SCIENTIFIC COMMITTEE

Prof. Dr. **Erinda LIKA**, *Vice Rector for Science and Projects*, AUT

Prof. Dr. **Ilir KAPAJ**, *Vice-Rector*, AUT

Prof. Asoc. **Romina KOTO**, *Vice-Rector*, AUT

Prof. Dr. **Endrit KULLAJ**, *Agricultural University of Tirana*, Albania

Prof. Dr. **Muhammad H. ZAMAN**, *Boston University*, USA

Prof. Dr. **Daniel MULLER**, *LAMO*, Germany

Univ. Prof. **Hans-Peter KAUL**, *BOKU-University*, Austria

Prof. Dr. **Joan B. ROSE**, *Michigan State University*, USA

Prof. Dr. **Anila HODA**, *Albanian Academy of Sciences*, Albania

Prof. **Niko QAFOKU**, *Pacific Northwest National Laboratory*, USA

Univ. Prof. Dr. **Matthias SCHREINER**, *BOKU-University*, Austria

Prof. **Sokrat SINAJ**, *Agroscope, Field Crop, Plant Nutrition*, Bern, Switzerland

Dr. **Kurt RICHTER**, *Michigan State University*, USA

Prof. **Giuseppe MAIORANO**, *Università degli Studi del Molise*, Italy

Prof. **Nazim GRUDA**, *Academy of Science*, Albania

Prof. Dr. **Seit SHALLARI**, *Agricultural University of Tirana*, Albania

Univ. Prof. Dr. **Hans SÖLKNER**, *BOKU-University*, Austria

Dr. **Stephan FUCHS**, *Karlsruhe Institute of Technology (KIT)*, Germany

Prof. **Thomas ERTL**, *BOKU-University of Natural Resources & Life Sciences*, Vienna, Austria

Prof. Dr. **Pandi ZDRULI**, *Mediterranean Agronomic Institute of Bari*, Italy

Dr. **Ndue KANARI**, *University of Lorraine*, Nancy, France

Dr. **Roza ALLABASHI**, *BOKU-University of Natural Resources & Life Sciences*, Vienna, Austria

Associate Professor. **Luuk FLESKENS**, *Wageningen University and Research*, Netherlands

Prof. Dr. **Lumturi PAPA**, *Agricultural University of Tirana*, Albania

Prof. Asoc. **Anila KOPALI**, *Agricultural University of Tirana*, Albania

Prof. Dr. **Vjollca IBRO**, *Agricultural University of Tirana*, Albania

Dr. **Pandeli PASKO**, *Mediterranean Agronomic Institute of Bari*, Italy

Dr. **Daniel MÜLLER**, *Humboldt University*, Berlin, Germany

Prof. Dr. **Myqerem TAJAJ**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Aida BANI**, *Agricultural University of Tirana, Albania*

Prof. Dr. **Etleva DASHI**, *Agricultural University of Tirana, Albania*

Prof. Ass. **David RANUCCI**, *University of Perugia, Italy*

Dr. **Nikola PUVACA**, *Faculty of Agriculture, Novi Sad University, Serbia*

Prof. Dr. **Spase SHUMKA**, *Agricultural University of Tirana, Albania*

Dr. **Zamir LIBOHOVA**, *USDA-NRCS, USA*

Dr. **Ida KRUTI**, *Vice-Rector, Qiriazi University, Albania*

Prof. Dr. **Halit XHAFI**, *Dean of the Faculty of Economics, Qiriazi University, Albania*

Prof. As. Dr. **Enida BOZHEKU**, *Dean of the Faculty of Law, Qiriazi University, Albania*

Prof. Dr. **Ylli ZHURDA**, *Head of the Department, Qiriazi University, Albania*

Prof. Dr. **Fadil MILLAKU**, *University "Haxhi Zeka", Peja, Kosovo*

Dr. **Albona SHALA**, *University "Haxhi Zeka", Peja, Kosovo*

Prof. Dr. **Ariola BACU**, *Tirana University, Albania*

SECRETARY OF THE CONFERENCE

Alketa GREPCKA

Edlira SADIKU

Sidita DUSHAJ

Alma KARASANI

Klaudia SARACI

- Narula, S., Sharma, R., & Mathur, A. (2017). Financial inclusion and agricultural development: Evidence from India. *International Journal of Social Economics*, 44(8), 1110–1122.
- Nizam, R., Karim, Z., Sarmidi, T., & Rahman, A. (2020). Financial Inclusion and Firms Growth in Manufacturing Sector: A Threshold Regression Analysis in Selected Asian Countries. . *Economics, MDPI Journal*, 1-12.
- Nwanko, O., & Nwanko, N. (2014). Sustainability of Financial Inclusion to Rural Dwellers in Nigeria: Problems and Way Forward. *Research Journal of Finance and Accounting*, 24-31.
- Ojokuku, R., & Sajuyigbe, A. (2014). Effect of Employee Participation in Decision Making on Performance of Selected Small and Medium Scale Enterprises in Lagos, Nigeria. *Journal of Business and Management*, 6 , 93-97.
- Ozili, P. (2020). Theories of financial inclusion. In *Uncertainty and Challenges in Contemporary Economic Behaviour. Emerald Publishing.*, 1–19.
- Pallavi, G., & Bharti, S. (2013). Role of Literacy Level in Financial Inclusion in India: Empirical Evidence. *Journal of Economics, Business and Management*. 272-276.
- Palmarudi, M., & Agussalim, M. (2013). Human Capital and Survival of Small Scale Food Processing Firms under Economic Crisis in Central Java Indonesia. *Australian Journal of Business and Management Research* 3, 16-29.
- Puryan, V. (2017). The Causal Relationship between Economic Growth, Banking Sector Development and Stock Market Development in Selected Middle-East and North African Countries. . *nternational Journal of Economics and Financial*, 575-580.
- Riggins, F., & Wamba, S. (2015). esearch directions on the adoption, usage, and impact of the Internet of Things through the use of big data analytics. *Proceedings of the 48th Hawaii International Conference on System Sciences (HICSS)*, 1531–1540. <https://doi.org/10.1109/HICSS.2015.186>.
- Robinson, J. (1952). *The generalization of the general theory*. In J. Robinson (Ed.), *Rate of interest and other essays*. London: London: MacMillan.
- Sarma, M., & Pais, J. (2011). Financial inclusion and development. *Journal of International Development*, 23(5), 613–628. <https://doi.org/10.1002/jid.1698>.
- Schumpeter, J. (1911). *The Theory of Economic Development*. Cambridge: Harvard University Press.
- Sharma, M. (2016). Financial inclusion: A prelude to economic status of vulnerable group. *International Journal of Research - Granthaalayah*, 147-154.
- Sharma, R., Gopalakrishnan, S., & Singh, P. (2025). Financial inclusion for sustainable agribusiness: A policy perspective. *Journal of Rural Development Studies*, 41, 215–232.
- Stephen, A. (2016). Effectiveness of Financial Inclusion Strategy in Nigeria. *2nd International Conference on Inclusive Economic Growth and Sustainable Development*, (pp. 1-21). Mysuru, India.
- United Nations. (2009). *Inter-agency Task Force on Financing for Development, Financing for Sustainable Development Report*. New York: New York: United Nations.
- Verheul, I., Stel, A., & Thurik, R. (2006). Explaining female and male entrepreneurship at the country level. *Entrepreneurship and Regional Development*, 151-183.
- World Bank . (2025). Development Indicators. [https://tradingeconomics.com/albania/indicators-wb data.html?g=agriculture+%26+rural+development](https://tradingeconomics.com/albania/indicators-wb-data.html?g=agriculture+%26+rural+development) .
- World Bank. (2021). Albania Country Economic Memorandum: A New Economic Model for Albania. *Washington, DC: World Bank*.

DETERMINANTS OF MARKET CONCENTRATION IN THE ALBANIAN BANKING SYSTEM, AN EMPIRICAL ANALYSIS USING THE HERFINDAHL-HIRSCHMAN INDEX

Ali SHINGJERGJI¹, Kevin BICA² and Altin KULLI³

¹ University College Qiriazi, Tirana, Albania, ali.shingjergji@qiriazi.edu.al, phone: +355 69 747 3264

² Canadian Institute of Technology, Tirana, Albania, kevin.bica@cit.edu.al +355 69 377 7717

³ University College Qiriazi, Tirana, Albania, altin.kulli@qiriazi.edu.al +355 69 224 2759

* Corresponding Author

ABSTRACT

This study examines the determinants of market concentration in the Albanian banking system, measured by the Herfindahl-Hirschman Index (H-Index), using quarterly data from 2016 to 2024 sourced from the Central Bank of Albania. Employing an Ordinary Least Squares panel estimator approach, it explores the relationship between the H-Index and internal bank-specific factors—such as loans' levels, ROE, ROA, and NPL ratios—as well as an external macroeconomic indicator like the Euro/ALL exchange rate. Building on prior literature, this research contributes a country-specific analysis of Albania's banking sector. The findings reveal that performance indicators (ROA and ROE) and the exchange rate are statistically significant determinants of market concentration, while other variables show limited impact. These insights offer valuable implications for financial regulators and banking institutions seeking to understand and manage concentration dynamics in emerging financial systems.

Keywords: *Market Concentration, Herfindahl-Hirschman Index, Banking System, Bank Performance*

JEL Classification: *G21, G28, C23, E44*

INTRODUCTION

Over the past decade, Albania's banking system has undergone significant structural, regulatory, and economic changes, shaping its current landscape. As a developing economy in Southeast Europe, Albania's financial system plays a vital role in promoting growth, financial inclusion, and stability. Dominated by a few banks, mostly subsidiaries of European foreign groups, the sector benefits from capital inflows, better governance, and regional integration, but also faces vulnerabilities. Market concentration remains high compared to other European countries, offering economies of scale but risking reduced competition and increased systemic risk. The economy has experienced stable, moderate GDP growth driven by consumption, remittances, and investments, with the banking sector crucial in financing this growth despite challenges like high NPLs and limited credit penetration.

Macroeconomic factors, such as exchange rate volatility, inflation, and unemployment, influence sector risks. The regulatory framework has aligned with EU directives and Basel standards, with the Central Bank actively enhancing capital requirements, transparency, and risk management to withstand shocks. In Albania's developing financial landscape, market concentration impacts stability, risk distribution, and efficiency. While high concentration poses systemic risks, a more competitive, fragmented system could provide lower interest rates [14], better asset pricing, and spur innovation in the circular economy by accelerating its adoption through green financing [10]; [12]; [23]. The aim of this study is to analyze the level of market concentration in Albania's banking sector and identify the main determinants of that concentration.

Market concentration in the banking sector significantly influences financial structure and competitiveness, affecting financial stability, credit access, pricing, and systemic risk in both emerging and advanced economies. This is evident

in European economies with robust regulatory frameworks [18], and in Albania, where a limited number of financial institutions exist, leading to high concentration.

This review synthesizes literature on determinants of market concentration, focusing on internal bank characteristics, macroeconomic factors, and regulatory environments. The Herfindahl-Hirschman Index (H-Index) is the primary metric for assessing market concentration, with a high index indicating reduced competition [5]; [3]. Higher market concentration is often linked with increased profitability and performance [20].

Banks performing well show higher ROA and ROE, enabling reinvestment and market power consolidation [11]; [22]; [7]. In Albania, empirical evidence suggests that bank performance enhances concentration, echoing trends in countries like Italy and Spain post-global crisis [1]; [8]. Strong capitalization allows banks to absorb shocks and maintain credit flow during downturns. In Albania, improved capital adequacy due to Basel III reforms has bolstered large banks' market shares [17]; [19].

Large banks benefit from economies of scale and dominate the Albanian market, comprising 60% of total assets, a trend observed in France, Germany, and the Nordic region [21]. Operational efficiency, indicated by cost-to-income ratios, also impacts concentration, as efficient banks gain market share [6]. Macroeconomic stability fosters a healthy financial sector. GDP growth can lower entry barriers, encouraging new banks and reducing concentration [11]; [13].

Conversely, economic downturns lead to consolidation. In Albania, moderate GDP growth driven by consumption has not prevented market consolidation due to underdeveloped capital markets [3]. The 2008 financial crisis and the Eurozone debt crisis in Europe led to increased concentration as weaker banks merged or collapsed [5]; [15]; [16]; [24].

Higher unemployment correlates with lower credit demand and elevated NPL ratios, leading to consolidation. In Albania, exchange rate fluctuations impact foreign-denominated loan portfolios. Recent studies show the exchange rate significantly drives concentration in the Albanian banking sector. In the EU, the ECB's prolonged low-interest-rate policy has pressured smaller banks, allowing larger banks to expand market share [21]; [25].

MATERIALS/METHODS

The data used for this study were obtained from the Central Bank of Albania and cover the period from 2016 to 2024. To maximize statistical relevance, we decided to collect them in quarters. They are also aggregated for the entire banking sector, as the study also refers to the competitiveness of the sector as a whole according to the H-index measure.

The study employs a panel approach and the Ordinary Least Squares (OLS) method to analyze the main factors influencing market concentration in the Albanian banking system. Since the data provided by the Bank of Albania is aggregated for the entire banking sector, this method is appropriate. Pooled OLS serves as an unbiased estimator when the homogeneity of entities is ensured. However, we recognize the limitations of the study, particularly the assumption of homogeneity, which may not be realistic when examining individual banks separately.

Below, we present the regression equation that represents the relationship between market concentration measured by the H-index with banks profitability measures and financial indicators:

$$\text{Market Concentration} = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon_t \quad (1)$$

where:

X1: Bilateral exchange rate EUR/ALL

X2: Non-Performing Loans

X3: Return on Assets

X4: Natural Logarithm of Loans

X5: Return on Equity

α_0 : Constant term

ϵ_t : Error term

t: Time

RESULTS AND DISCUSSION

The empirical results of this study highlight several key factors influencing the increase in banking activity concentration.

The bilateral EUR/ALL exchange rate has a negligible yet negative effect on the H-index, along with return on assets and loan log, which significantly decrease market concentration—each 1% increase in ROA reduces the H-index by 0.04, and each 1% rise in loans by 0.0004, with typical H-index values between 0.14–0.15.

Conversely, return on equity and NPLs positively influence the H-index [9], indicating increased concentration and reduced competitiveness. Each 1% rise in ROE adds 0.002, and in NPLs adds 0.0004 to the H-index.

Overall, Albania's banking system shows low-to-moderate concentration, with profitability and NPL levels affecting market structure. To stay competitive, banks should diversify into green economy sectors beyond high-profit areas.

The table below summarizes the empirical results:

Table 2. Regression Equation

Dependent Variable: H_INDEX				
Method: Panel Least Squares				
Cross-sections included: 9				
Total panel (balanced) observations: 36				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EUR_ALL	-0.000682	0.000214	-3.18379	0.0034
NPL	0.000462	0.000229	2.022689	0.0521
ROA	-0.026796	0.009583	-2.79627	0.0089
L_LOANS	-0.043948	0.010021	-4.38567	0.0001
ROE	0.002177	0.000903	2.411801	0.0222
C	0.820696	0.152404	5.384992	0.0000
R-squared	0.707873	Mean dependent var		0.146389
Adjusted R-squared	0.659186	S.D. dependent var		0.005426
S.E. of egression	0.003168	Akaike info criterion		-8.52053
Sum squared resid	0.000301	Schwarz criterion		-8.25661
Log likelihood	159.3696	Hannan-Quinn criter.		-8.42842
F-Statistic	14.53904	Durbin-Watson stat		0.940767
Prob (F-statistic)	0.000000			

ACKNOWLEDGMENTS

I would like to express my sincere gratitude to one of my co-authors, PhD (c) Kevin Bica, whose editorial insight and analytical precision greatly enriched this study. I also extend heartfelt thanks to the conference organizers for providing a platform that supports meaningful academic exchange and interdisciplinary dialogue.

REFERENCES

- [1] Altunbas, Y., Gardener, E. P. M., Molyneux, P., & Moore, B. (2001). Efficiency in European banking. *Eur. Econ. Rev.*, 45(10), 1931–1955. [https://doi.org/10.1016/S0014-2921\(00\)00039-2](https://doi.org/10.1016/S0014-2921(00)00039-2)
- [2] Bain, J. S. (1951). Relation of profit rate to industry concentration: American manufacturing, 1936–1940. *Q. J. Econ.*, 65(3), 293–324. <https://doi.org/10.2307/1882217>

- [3] Bank of Albania. (2023). *Annual supervision report*. <https://www.bankofalbania.org>
- [4] Barth, J. R., Caprio, G., & Levine, R. (2004). Bank regulation and supervision: What works best? *J. Financ. Intermed.*, 13(2), 205–248. <https://doi.org/10.1016/j.jfi.2003.06.002>
- [5] Beck, T., Demirgüç-Kunt, A., & Levine, R. (2006). Bank concentration, competition, and crises: First results. *J. Bank. Financ.*, 30(5), 1581–1603. <https://doi.org/10.1016/j.jbankfin.2005.05.010>
- [6] Berger, A. N., Demirgüç-Kunt, A., Levine, R., & Haubrich, J. G. (2004). Bank concentration and competition: An evolution in the making. *J. Money Credit Bank.*, 36(3), 433–451. <https://doi.org/10.1353/mcb.2004.0034>
- [7] Berger, A. N., & Mester, L. J. (1997). Inside the black box: What explains differences in the efficiencies of financial institutions? *J. Bank. Financ.*, 21(7), 895–947. [https://doi.org/10.1016/S0378-4266\(97\)00010-1](https://doi.org/10.1016/S0378-4266(97)00010-1)
- [8] Bonin, J. P., Hasan, I., & Wachtel, P. (2005). Bank performance, efficiency and ownership in transition countries. *J. Bank. Financ.*, 29(1), 31–53. <https://doi.org/10.1016/j.jbankfin.2004.06.015>
- [9] Bonin, J. P., & Huang, Y. (2001). Dealing with the bad loans of the Chinese banks. *J. Asian Econ.*, 12(2), 197–214.
- [10] Carbo-Valverde, S., Humphrey, D. B., & Rodríguez-Fernandez, F. (2009). Bank market power and SME financing constraints. *Rev. Financ.*, 13(2), 309–340. <https://doi.org/10.1093/rof/rfn017>
- [11] Claessens, S., & Laeven, L. (2004). What drives bank competition? Some international evidence. *J. Money Credit Bank.*, 36(3), 563–583. <https://doi.org/10.1353/mcb.2004.0044>
- [12] Cull, R., Demirgüç-Kunt, A., & Morduch, J. (2009). Microfinance meets the market. *J. Econ. Perspect.*, 23(1), 167–192. <https://doi.org/10.1257/jep.23.1.167>
- [13] Dabla-Norris, E., & Floerkemeier, H. (2007). Bank efficiency and market structure: What determines banking spreads in Armenia? *IMF Working Paper*, No. 07/134. <https://doi.org/10.5089/9781451866983.001>
- [14] Demsetz, H. (1973). Industry structure, market rivalry, and public policy. *J. Law Econ.*, 16(1), 1–9. <https://doi.org/10.1086/466752>
- [15] Enria, A. (2020). Banking consolidation and the European banking market. *European Central Bank*. <https://www.bankingsupervision.europa.eu>
- [16] European Central Bank (ECB). (2017). *Report on financial structures*. <https://www.ecb.europa.eu>
- [17] Fiordelisi, F., & Mare, D. S. (2014). Competition and financial stability in European cooperative banks. *J. Int. Money Finance*, 45, 1–16. <https://doi.org/10.1016/j.jimonfin.2014.02.008>
- [18] International Monetary Fund (IMF). (2013). *Global financial stability report: Transition challenges to stability*. <https://www.imf.org>
- [19] International Monetary Fund (IMF). (2020). *Albania: Financial sector assessment program*. <https://www.imf.org>
- [20] Kok, C., et al. (2016). Banking consolidation and financial stability: An analytical framework. *ECB Financial Stability Review*.
- [21] Langfield, S., & Pagano, M. (2016). Bank bias in Europe: Effects on systemic risk and growth. *Econ. Policy*, 31(85), 51–106. <https://doi.org/10.1093/epolic/eiv017>
- [22] Mamatzakis, E. (2015). Are there any credible determinants of bank performance in transition economies? *Appl. Financ. Econ.*, 25(13), 1041–1051. <https://doi.org/10.1080/09603107.2014.925064>
- [23] OECD. (2020). *Banking competition and efficiency in Nordic countries*. <https://www.oecd.org>
- [24] Popov, A., & Udell, G. F. (2012). Cross-border banking and the international transmission of financial distress during the crisis of 2007–2009. *IMF Econ. Rev.*, 60, 1–33. <https://doi.org/10.1057/imfer.2012.1>
- [25] Restoy, F. (2019). How to improve crisis management in the banking union: A European perspective. *Bank for International Settlements*.
- [26] Vives, X. (2019). Digital disruption in banking. *Annu. Rev. Financ. Econ.*, 11, 243–272. <https://doi.org/10.1146/annurev-financial-100719-120854>