

Stress Testing the Albanian Banking Sector: A Decade Post-FSAP

Jakree Koosakul and Eugena Topi

SIP/2025/039

IMF Selected Issues Papers are prepared by IMF staff as background documentation for periodic consultations with member countries. It is based on the information available at the time it was completed on December 17, 2024. This paper is also published separately as IMF Country Report No 25/21.

2025
APR



IMF Selected Issues Paper
European Department

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Authorized for distribution by Anke Weber
April 2025

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ABSTRACT: Over the past decade, the Albanian banking sector has undergone a remarkable transformation amid strong macroeconomic performance and sound financial reforms. Nevertheless, pockets of vulnerability remain, including some that were identified during the IMF's 2014 Financial Sector Assessment Program (FSAP). To assess the resilience of the Albanian banking sector, this paper conducts capital adequacy and liquidity stress testing exercises using supervisory bank-level data. The results indicate banks' broad resilience to shocks arising from non-performing loans and interest rates. On the other hand, vulnerabilities owing to large-borrower and sovereign exposures are found to be material in some cases. Relatedly, while banks are found to have adequate high-quality liquid assets under liquidity stress scenarios, such resilience hinges importantly on their access to the Bank of Albania's liquidity facility. Such results call for further strengthening of the macroprudential toolkit and continued efforts to deepen financial markets.

RECOMMENDED CITATION: Jakree Koosakul and Eugena Topi. 2025. "Stress Testing the Albanian Banking Sector: A Decade Post-FSAP" IMF Selected Issues Paper (SIP/2025/039) Washington D.C.: International Monetary Fund.

JEL Classification Numbers:	E44, G21, G28
Keywords:	Albania, banking sector, stress testing, capital adequacy, liquidity, large exposure, sovereign-bank nexus
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SELECTED ISSUES PAPERS

Stress Testing the Albanian Banking Sector

A Decade Post-FSAP

Albania

Prepared by Jakree Koosakul and Eugena Topi¹

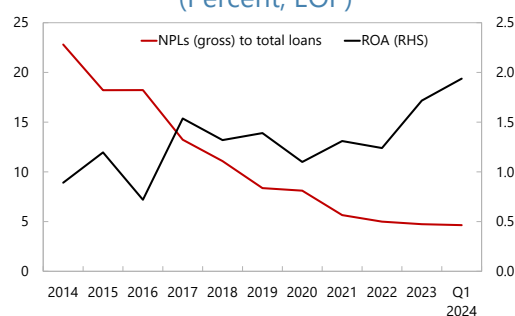
¹ The authors are grateful to Anke Weber for providing overall guidance and feedback on the project and to the Bank of Albania for providing granular bank-level data used in the analysis. We would also like to thank David Bartolini, Piyabha Kongsamut, Ying Xu and seminar participants at the Bank of Albania for helpful comments, and Zeju Zhu for excellent research assistance.

STRESS TESTING THE ALBANIAN BANKING SECTOR: A DECADE POST-FSAP

A. Introduction

1. Over the past decade, the Albanian banking sector has undergone a remarkable transformation. From a peak of almost 25 percent in 2014—amid lackluster macroeconomic performance, sizable government arrears, and weak underwriting standards (see the 2014 Financial Sector Assessment Program (FSAP) [Report](#))—non-performing loans (NPLs) declined to just under 5 percent of total loans in Q1 2024, thanks to [financial reforms](#) and a strong macroeconomy. The degree of foreign ownership has declined significantly, with the share of assets owned by foreign banks falling from 90 percent in 2013 to 65 percent in Q1 2024, reducing the system’s vulnerability to contagion risks from external shocks. Banking supervision has also been continually strengthened, with the aim to better align microprudential regulations with international standards and enhance macroprudential tools to safeguard financial stability.²

Figure 1. Albania: Banks’ Non-performing Loans and Profitability
(Percent; EOP)



Sources: Bank of Albania and IMF staff calculations.

2. The sector has weathered a series of recent shocks well. Despite being confronted with multiple domestic and global shocks in recent years (the 2019 earthquake, pandemic, Russia’s war in Ukraine), the banking sector has remained resilient. Banking sector profitability has been sound and stable with an average return-on-assets of around 1 percent between 2019 and 2022, which rose to an average of 1.7 percent in 2023 and 2024 on the back of higher interest income amid higher monetary policy rates. While heterogeneity exists, banks have remained well-capitalized and liquid, with an average capital adequacy ratio of 19.3 percent in July 2024 (compared to the minimum regulatory requirement of 12 percent) and liquidity ratios above regulatory requirements.

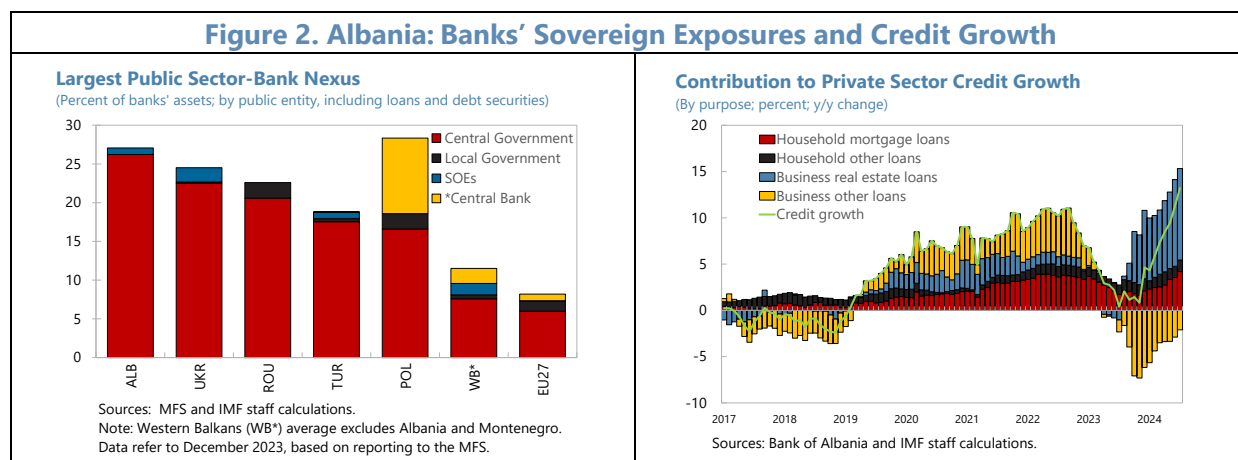
3. Nevertheless, pockets of vulnerability remain, including some that were identified in the 2014 FSAP Report. Albania continues to rank among the top in Europe in terms of banks’ sovereign securities holdings, posing risks stemming from the sovereign-bank nexus.³ Local-currency government bond and money markets remain illiquid, which could complicate banks’ ability to generate liquidity during stress episodes. The economy remains highly euroized, and while unhedged FX lending has declined as a share of total FX loans, two-thirds of unhedged FX loans are concentrated in the real estate sector, which has recently seen rapid credit growth in 2024 and continued price increases.

² See, for example, the discussion in [Bozdo et al \(2023\)](#).

³ For a discussion of the nexus, see [April 2022 Global Financial Stability Report, Chapter 2](#).

4. Against this backdrop, this paper conducts two sets of stress testing exercises to assess the resilience of the Albanian banking sector to shocks. First, based on the methodology developed by Cihak (2014), banks' *capital adequacy* is examined under stress scenarios covering two broad categories of risks, namely: credit (NPL and large exposure) and market (interest rate and exchange rate). Second, banks' *liquidity resilience* is assessed through an additional exercise that varies key assumptions on the haircuts of liquid assets assumed under the liquidity coverage ratio (LCR) standard.

5. The rest of the paper proceeds as follows. Section B presents a brief overview of the Albanian banking sector. Stress test results on banks' capital adequacy and liquidity are provided in Sections C and D, respectively.

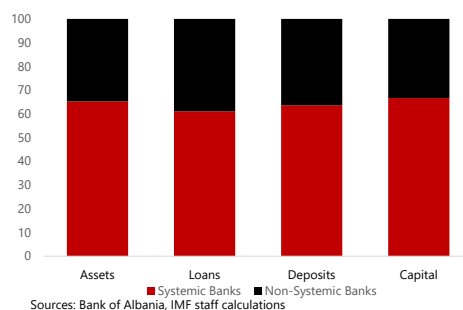


B. The Albanian Banking Sector: A Quick Glance

6. Albania's financial system is predominantly bank-based. The 11 commercial banks currently own over 90 percent of overall financial sector assets. Following the introduction of macroprudential capital buffers, the Bank of Albania (BoA) introduced a methodology for identifying systemic banks in line with international methodologies. Based on this methodology, four banks are currently identified as domestic systemically important banks (D-SIBs), owning 65 percent of banks' assets and 66 percent of banks' capital. With a Herfindahl-Hirschman Index (HHI) of 1428 based on Q1:2024 banks' total asset data provided by the BoA, the sector is considered competitive.⁴

Figure 3. Albania: Structure of the Banking Sector, Q1 2024

(Percent based on ownership origin)



⁴ A common measure of market concentration, the HHI is calculated by squaring the market share of each firm competing in a market and then summing the resulting numbers. A market with an HHI of less than 1,500 is typically considered competitive.

7. Banks are subject to a range of regulatory capital and liquidity requirements. Albanian

banks are subject to a minimum Pillar 1 capital requirement of 12 percent (compared to 8 percent in EU countries). In addition, they are required to comply with a capital conservation buffer (2.5 percent in 2024), a buffer for systemically important banks (0.5–1.5 percent for the four D-SIBs), and by June 2025 an additional 0.25 percent from the [recent activation](#) of the countercyclical buffer (CCyB), as well as large exposure and leverage ratio standards.⁵ On the liquidity front, banks are subject to liquidity coverage (LCR) and net stable funding ratio (NSFR) requirements, which are also differentiated based on significant currencies, among other requirements.⁶ Although heterogeneity exists, most banks are compliant with respect to these requirements.

Figure 4. Albania: Actual Rates of Macprudential Tools (Percent)

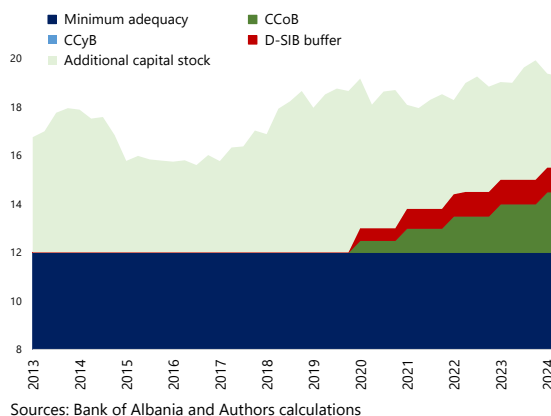
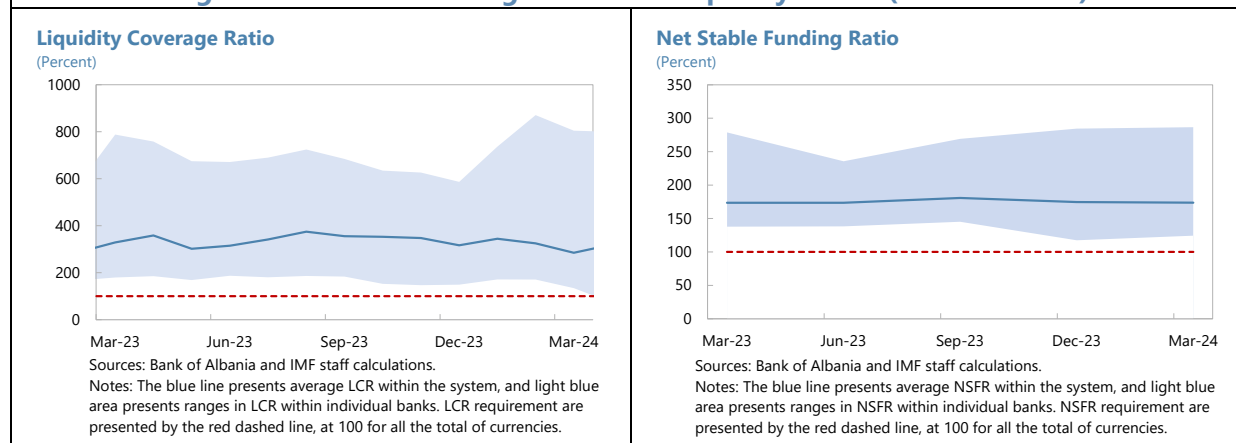


Figure 5. Albania: Banking Sector and Liquidity Ratios (All Currencies)



C. Stress Testing Banks' Capital Adequacy

8. A balance-sheet approach to stress testing is employed according to the methodology developed by Cihak (2014). The approach utilizes bank-by-bank balance sheet data for Q1:2024 to

⁵ Under the single lending limit regulation, banks' maximum exposure to each counterparty is capped at 20 percent of capital (10 percent for a related party). Under the leverage ratio requirement, banks are required to hold capital equal to at least 5.75 percent of their non-risk-weighted assets (relative to the 3 percent required according to the EU regulation).

⁶ See 2023 Article IV [Report](#) for Albania.

examine the impact of exogenous shocks on individual banks' capital adequacy. A major advantage of this bottom-up approach derives from its focus on granular data, which allows sources of risk at the individual bank level to be captured in a relatively precise manner. While the approach may be less suitable for large and complex financial systems due to computational complexity and data insufficiency, it is suitable in the context of Albania's relatively small and non-complex banking sector.

9. The stress test covers several key dimensions of risks. These include credit risks through NPL-related and large exposure channels, and market risks through interest rate and exchange rate channels. Under these scenarios, banks' capital adequacy is assessed vis-à-vis the 12 percent minimum requirement. That is, banks are deemed to experience a capital shortfall only if their capital adequacy ratio (CAR) falls below 12 percent. The relevant horizon for the duration of each shock is one year.

Credit Risks

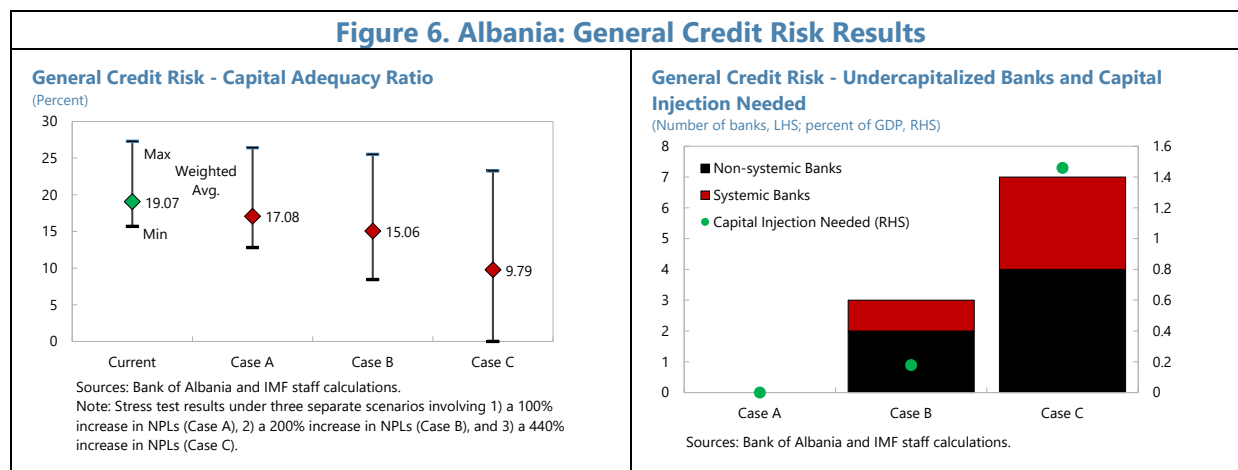
10. The credit risk stress tests, which assess the impact on banks' capital adequacy arising from the default of borrowers on their contractual obligations, consist of two channels.

- **General credit risk:** assumes a decline in banks' asset quality leading to a rise in NPLs.⁷ The NPL increase is assumed to be distributed within the system in proportion to the current share of individual banks' NPLs. Three stress scenarios with varying degrees of severity are considered, including (i) a baseline stress scenario with a 100-percent increase in NPLs (in line with the assumption in the 2023 Article IV [Report](#)); (ii) a more severe stress scenario assuming a 200-percent increase in NPLs; and (iii) an extreme scenario of a 440-percent increase, which would bring back the NPL ratio to the historical high level observed in 2014. All scenarios assume a 65-percent provisioning rate, in line with the data.
- **Large exposure risk:** assumes the failure of the largest borrower(s) of each bank. Two scenarios are considered, including (i) a baseline stress scenario assuming the failure of the largest borrower; and (ii) a more severe stress scenario involving the failure of top two largest borrowers.

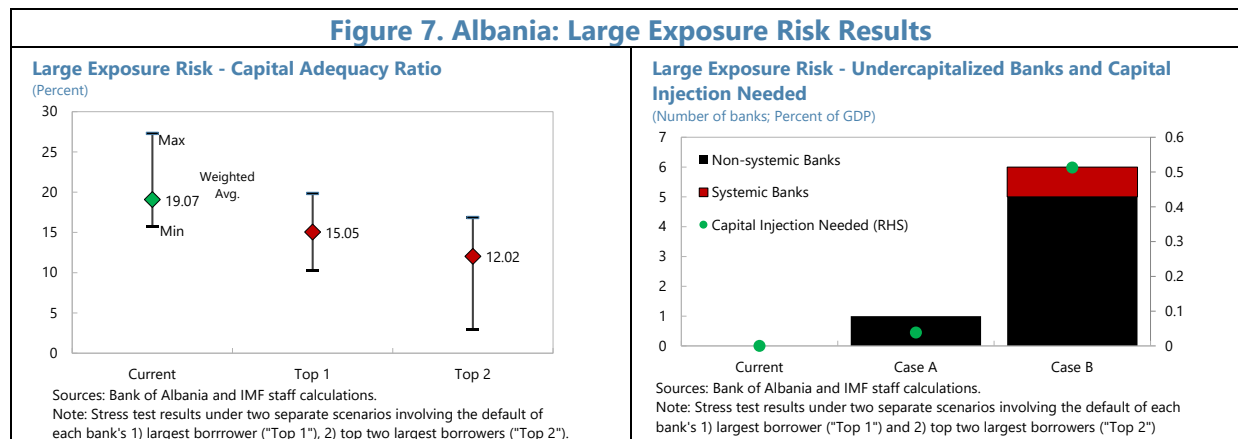
11. Banks are broadly resilient to general credit shocks, experiencing significant capital shortfalls only under the most extreme scenario. Under the baseline stress scenario, all banks are found to have sufficient capital to withstand the credit shock, with an average CAR of around 17 percent, well above the minimum requirement. Under the more severe scenario, the average CAR remains above 12 percent. While three banks—including one D-SIB—are found to experience a capital shortfall, the required capital injection is minimal (0.2 percent of GDP). Only under the extreme scenario—where the NPL ratio rises to reach the historic high level in 2014—are multiple banks, including three D-SIBs, found to experience significant capital shortfalls. Under this scenario, the required capital injection is more sizable, at around 1.5 percent of GDP. This scenario is unlikely

⁷ The test is agnostic to the underlying cause of the decline, but this could for example arise from a protracted macroeconomic slowdown or recession.

but demonstrates the significant decline in credit risk faced by banks given the significant fall in NPLs over the past decade.



12. The banking sector is susceptible to credit risk resulting from large exposures. One bank is found to experience a capital shortfall in the scenario involving the default of the largest borrower, with system-wide CAR dropping from around 19 percent to 15 percent. The number of banks with capital shortfalls increases to six, including one D-SIB, if the two largest borrowers default, which also sees a fall of the system-wide CAR almost below 12 percent. The capital injection needed under the latter scenario amounts to 0.5 percent of GDP.



Market Risks

13. The market risk stress tests assess the banking sector's resilience to changes in interest and exchange rates.

- **Interest rate risk:** consists of two channels.⁸ First, a "flow" channel examines the changes in interest income and interest expenses resulting from the "gap" between the flow of interest on

⁸ It may be the case that an increase in interest rates may also affect the creditworthiness and/or the ability to repay of corporates and households, thereby increasing banks' NPLs. This indirect channel is not captured in the current stress test. As such, the results should be viewed as lower-bound estimates.

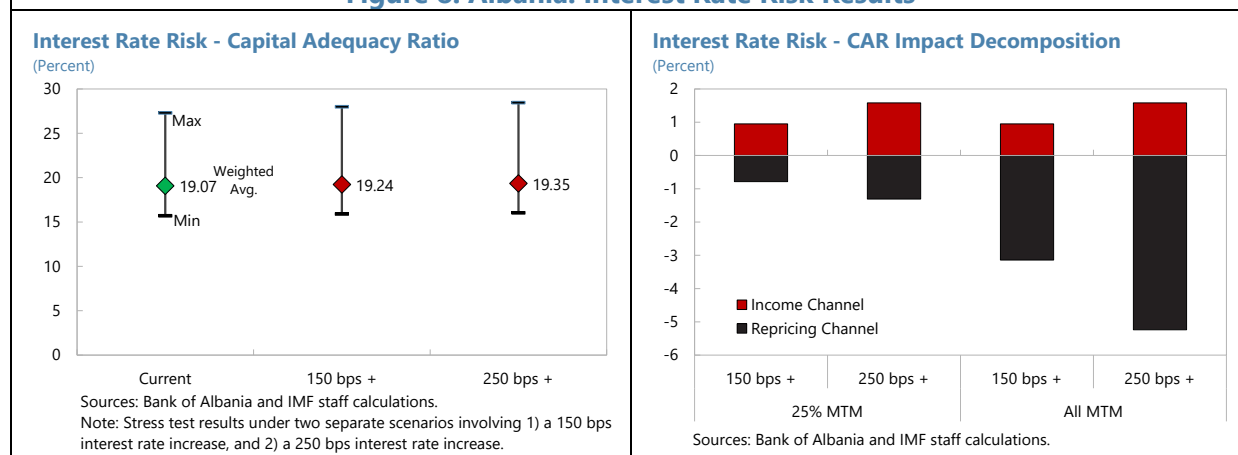
the holdings of interest-sensitive assets and liabilities. Second, a “stock” channel assesses the impact of interest changes on the value of marked-to-market (MtM) bonds held by the commercial banks. It is assumed, based on the information provided by the BoA, that 25 percent of bonds in banks’ portfolio are MtM, with the rest held-to-maturity (HtM).⁹ Two scenarios are considered, including (i) a baseline stress scenario assuming a 150-basis point (bps) increase in interest rate; and (ii) a more extreme scenario assuming a 250-bps increase.

- **Exchange rate risk:** also arises through two channels. First, a direct channel examines the impact of changes in the exchange rate on the local currency value of the net FX position of banks. Second, an indirect channel assesses the extent to which exchange rate movements influence the creditworthiness and ability to repay of corporates and households, and therefore banks’ NPLs. This can arise from the impact of FX movements on firms’ competitiveness, or more directly through their impact on firms’ net open positions in foreign currencies. Two scenarios are considered, including (i) a baseline stress scenario assuming a 25-percent depreciation of the lek vis-à-vis the euro (which would bring the exchange rate roughly at the pandemic-era level); and (ii) a more extreme scenario assuming a 40-percent depreciation (which would bring the exchange rate to its pre-pandemic level).

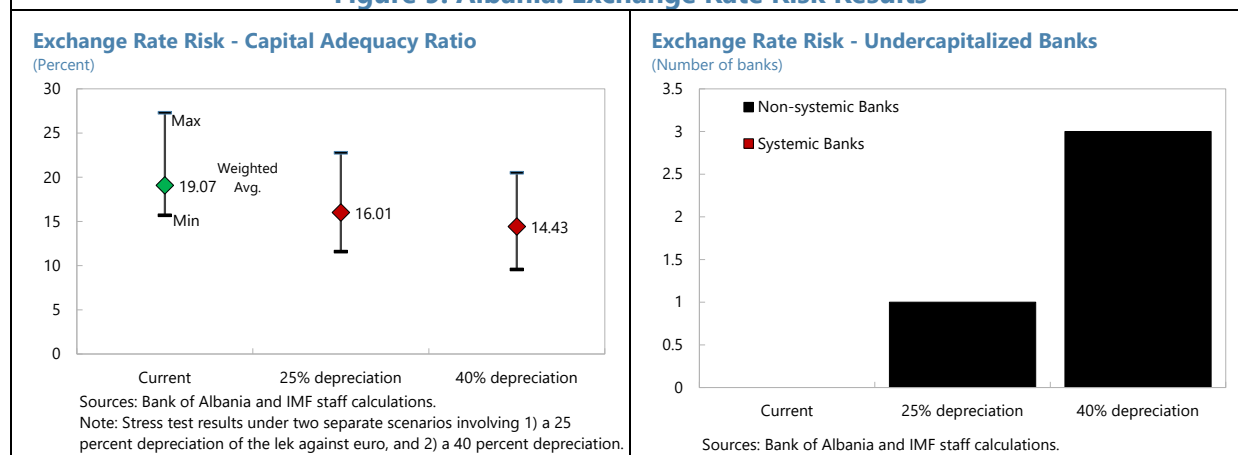
14. Banks are resilient to interest rate shocks, although vulnerability emerges if the baseline MtM assumption is relaxed.

- Under both baseline and more extreme scenarios, banks’ capital ratio is found to be little affected by interest rate shocks. This finding arises as the two channels appear to work in opposite directions. On the one hand, due to banks generally having more interest-sensitive assets than interest-sensitive liabilities, they appear to *benefit* from an interest rate increase. On the other hand, an interest rate rise leads to a fall in the MtM value of bonds in banks’ portfolios, reducing their capital ratio. Under the baseline assumption that only 25 percent of banks’ bond portfolio is MtM, the quantitative effects of the two channels almost completely offset each other.
- In practice, there may be circumstances (for example, during a liquidity crisis) in which banks may be forced to sell bonds beyond the intended MtM portion. In this spirit, if all bonds in banks’ portfolio are instead assumed to be MtM, there is a sizable negative effect coming from the repricing channel, such that the overall impact of an interest rate rise is negative and sizable. All banks remain capitalized above the minimum requirement under the baseline scenario of a 150-bps increase, while two banks (including one D-SIB) are found to experience a mild shortfall despite the system-wide CAR remaining at 15.4 percent.

⁹ In principle, the impact of an interest rate change on the bond market value is a function of the duration of the bonds held. This information is provided by the BoA.

Figure 8. Albania: Interest Rate Risk Results

15. There is some vulnerability to exchange rate shocks. Under the baseline scenario of a 25-percent lek depreciation against the euro, the system-wide CAR drops by around 3 percentage points with one bank falling short of the required capital ratio, although it remains well above the 12-percent requirement. In the more extreme scenario of a 40-percent depreciation, the system-wide CAR remains above the minimum requirement, with three banks experiencing capital shortfalls, although none of such banks is systemically important. Decomposing the total impact, the direct channel appears to play a slightly more significant role, responsible for around 60 percent of the reduction in the system-wide capital ratio.

Figure 9. Albania: Exchange Rate Risk Results

D. Stress Testing Banks' Liquidity Resilience

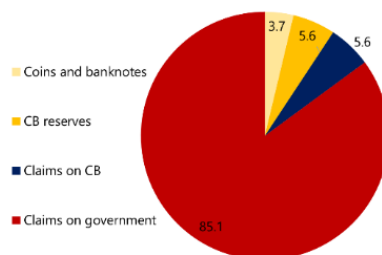
16. With the aim of promoting banks' short-term liquidity resilience, the LCR was introduced as a key reform under Basel III following the global financial crisis. The standard seeks to ensure that banks have an adequate stock of unencumbered high-quality liquid assets (HQLAs) to meet their liquidity needs for a 30-calendar day liquidity stress scenario. Crucial in the definition of securities that qualify as HQLA is that such assets can be converted into cash easily and

immediately, with minimal price impact, in secondary markets to meet banks' liquidity needs. This section focuses on banks' LCR in lek, as foreign-currency-denominated HQLAs (for example, euro bonds) are deemed to be appropriately liquid.¹⁰

17. Albanian government securities are assumed to be an important source of liquidity under the LCR and constitute a primary source of lek liquidity for Albanian banks.

For the purpose of calculating the amount of HQLA, each asset is assigned a haircut value, to be applied to its notional amount to arrive at the adjusted amount that is considered HQLA. Albanian government securities are treated favorably, with a haircut of 0 percent, in the same category as coins, banknotes, and qualifying central bank reserves.¹¹ Due to large holdings of Albanian government bonds amid a lack of other financial instruments, such bonds constitute the lion's share of Albanian banks' HQLA in lek.

Figure 10. Albania: Composition of HQLA in Lek (Percent)



Sources: Bank of Albania and IMF staff calculations.

18. This section examines the sensitivity of banks' assumed liquidity buffers under the LCR to alternative assumptions on government bond liquidity.

- In the absence of a liquid secondary bond market in Albania, banks' ability to generate lek liquidity through the sale of their Albanian sovereign securities with minimal price impact (as assumed under the LCR) may not hold in practice. While the BoA's liquidity facility—which allows banks to pledge their liquid assets in exchange for short-term liquidity—helps alleviate liquidity pressures to a large extent, the existence of haircuts and margins necessary to protect the BoA from credit risks still implies lower liquidity than suggested by banks' LCR values. In this light, stress tests are conducted to examine the effects of altering the assumption on the government bond haircut on banks' liquidity buffers under the LCR.
- Two scenarios are considered, namely (i) a scenario assuming banks' access to the BoA's facility, with an assumed haircut of 20 percent; and (ii) a scenario involving no access to the facility, with a haircut of 90 percent. The latter scenario would arise if the bank in question is experiencing both liquidity and solvency issues at the same time, making the liquidity facility inaccessible. In this scenario, we assume that the bank would need to liquidate its securities in the secondary

¹⁰ Consistent with international best practices, Albanian banks are required to maintain their LCR above 100 percent on an all-currency and all-significant-currency basis. In addition, they are also required to monitor LCR in lek and in each of the significant foreign currencies.

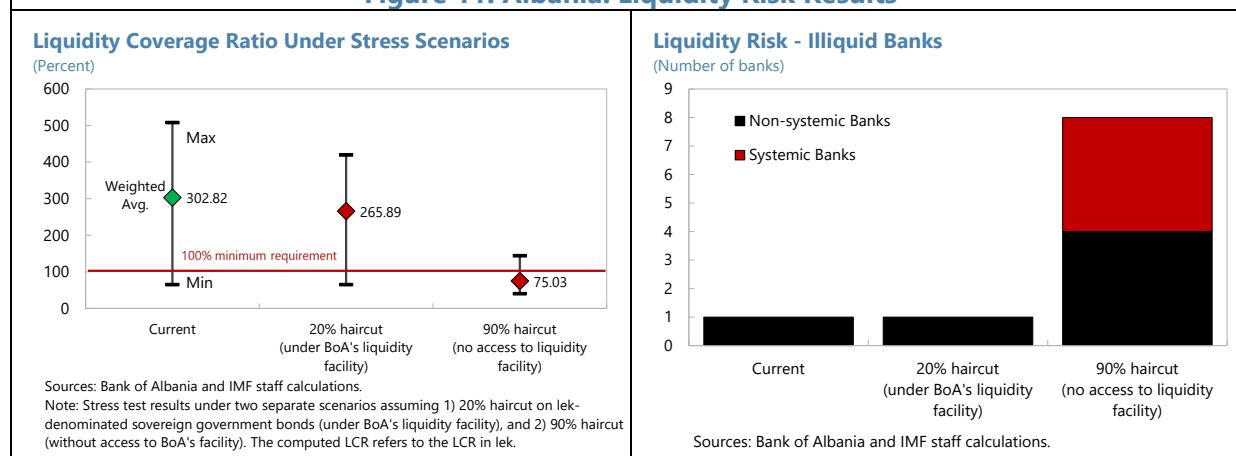
¹¹ In line with international standards (see, for example, [BCBS 2013](#)).

market, subject to a 90-percent haircut, given the market's lack of liquidity.¹² The analysis is based on the March 2024 LCR dataset provided by the BoA.

19. Banks' liquidity resilience depends crucially on access to the BoA's facility, absent a liquid secondary bond market.

- Under the current LCR assumption of a zero haircut, almost all banks (except for one outlier) currently maintain a very comfortable LCR in lek well above 100 percent, with the system-weighted average of 303 percent. Under the assumption of a 20-percent haircut (with access to the BoA's facility), the average falls marginally to 266 percent, and no additional bank is found to experience a liquidity shortfall.
- Without access to the BoA's facility, however, banks' ability to meet net cash outflows is greatly compromised, with the system-wide average dropping to 75 percent, below the minimum requirement. In such a scenario, eight banks are found to experience a liquidity shortfall, including all four D-SIBs. These results suggest that banks' ability to meet liquidity needs under stress depends crucially on access to the BoA's facility. Going forward, continued efforts to develop the secondary bond market as well as the secured money market would be important for improving market participants' resilience to liquidity risks through market-based mechanisms.

Figure 11. Albania: Liquidity Risk Results



¹² While a 90-percent haircut may appear extreme, the resulting amount that is assumed to be liquidated under the scenario remains well above the actual 30-day turnover of the Albanian secondary government bond market. The monthly bond market turnover stands at around 100 million lek, against the median amount of 2,738 million lek that is assumed to be sold under the 90-percent haircut scenario. Therefore, the amount of expected liquidity shortfall may still be considered as a lower-bound estimate.

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