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Do the Same Determinants Affect Banks' Profitability and Liquidity? Evidence from West Balkan Countries Using a Panel Data Regression Analysis

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Abstract: This study aims to determine whether the same bank-specific and macroeconomic determinants affect banks' profitability and liquidity. To achieve the set goal, panel data regression analysis was applied with fixed effects or random effects depending on the results of the Hausman test, as explained in the Results. The research is based on the use of aggregate data on bank-specific and macroeconomic determinants of banks' profitability and liquidity in West Balkan countries during the period from 2007 to 2022. The dependent variables in the study are ROA, ROE used as proxies for banks' profitability, and banks' liquid reserves to banks' total assets as a proxy for banks' liquidity. The findings confirm that the bank-specific and macroeconomic determinants affect both banks' profitability and liquidity in the same direction, except for a few variables. The main contribution of this research is a comprehensive and parallel view of banks' profitability and liquidity determinants that enables a guide for bank management to better understand the significance of bank-specific and macroeconomic determinants' effects on their business. The obtained results can improve the balance between the two important principles of banking business.

Keywords: panel data regression; banks' performance; banks' profitability; banks' liquidity; bank-specific determinants; macroeconomic determinants; West Balkan countries

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1. Introduction

In the last few decades, European banks have been less profitable than their counterparts in the US [1]. West Balkan countries have shown higher profitability rates than the average for European banks from 2016 until today, based on data retrieved from the national bank of each country and Statista data. The first objective of this paper is to determine whether bank-specific or macroeconomic determinants are affecting the banks' profitability. There is another important issue that must be addressed in times of financial market turbulence, and that is the banks' liquidity levels. Banks create liquidity by converting their illiquid assets into liquid and safer deposits [2]. However, many banks did not carefully manage their liquidity during the 2007–2009 financial crisis [3].

The financial crisis of 2008 had a significant effect on financial markets, particularly the banking system [4]. The primary focus of global banking regulators has been to increase bank liquidity keeping excess liquidity buffers [5].

After the financial crisis of 2007–2009, in addition to capital adequacy, emphasis in the Basel standards was also placed on liquidity monitoring. Two standards of liquidity measures are imposed on the banks. One is the liquidity covering ratio (LCR), and the other is the net stable funding ratio (NSFR) standard. LCR makes sure that the banks have high-quality liquid assets to net cash outflows over 30 days under stress conditions.

The NSFR standard makes sure that the bank has available stable funding for required stable funding. Furthermore, banks tend to increase the levels of LCR in financial distress situations [6]. The purpose of these liquidity standards is to increase the liquidity buffers and contribute to the banks' stability, while keeping in mind that the liquidity has to be managed on both an individual level and a system level. The new standards possibly affect bank balance sheets in terms of maturity structure, asset, and funding criteria [7]. Similarly, Veeramoothoo and Hammoudeh [8] indicate that the function of these indicators is to reduce liquidity risk and maturity transformation. Namely, Hong et al. [6] have shown that systemic liquidity risk caused bank failures in 2009 and 2010. With the implementation of countercyclical capital reserves introduced with Basel III [9], a greater stability in banking systems should be achieved.

The implementation and monitoring of additional liquidity standards with Basel III may have led to higher levels of liquidity and stability for banks, but also inevitably to a decrease in profitability [10]. Namely, there should be a trade-off between liquidity and profitability so that neither the liquidity standard nor the profitability standard is threatened.

The aim of this study is to determine whether the same determinants affect the banks' profitability and liquidity in the West Balkan countries using panel regression models. Many studies address separately the determinants of profitability and the determinants of liquidity, but none of them consider whether the same determinants affect both. According to the authors' knowledge, this is the first study that simultaneously estimates the same determinants of banks' profitability and liquidity in the West Balkan region. This is the main contribution of the conducted analysis which classifies this research as original and lucrative to bank managers and the scientific community.

This study analyzes the West Balkan countries because of the importance of banks in their financial systems. These countries' financial systems mainly rely on banks, which gives particular importance to the analysis of the liquidity and profitability of banks.

The practical application of this study is certainly reflected in the information given to the bank managers about which variables to give the most attention to when creating liquidity and profitability policies in the banks. On the other hand, this study also has implications for economic policymakers because it answers the question of whether and how much the banks themselves influence their profitability and liquidity, or whether it depends mainly on macroeconomic indicators that the banks themselves do not influence.

The paper is structured in five parts. After the introduction, the theoretical background of the research is shown in two parts. First, the potential determinants of profitability are considered, and second, the liquidity determinants are analyzed. After the literature review, the data and methodology section deals with the explanation of the sample and the methodology used in this research. The result and discussion part, separately show the results of the chosen models, and the explanations of the results with an overview of the implications of the findings. Finally, the conclusion summarizes the findings with an overview of the limitations of the study, and gives recommendations for further research.

2. Literature Review

In order to summarize and make a synthesis of the determinants that are included in this analysis, the review of the literature is divided into two parts. The first considers the theoretical background of the profitability determinants, and the second deals with the liquidity determinants at both bank-specific and macroeconomic levels. The studies dealt separately with profitability determinants and liquidity determinants; there is a lack of literature when it comes to the common considerations of profitability and liquidity. This study's intention is to contribute to reducing this gap in the literature.

2.1. Determinants of Banks' Profitability

Keeping in mind that banks have a central role in the financial sector, a sound and profitable banking sector is one of the most essential components for the effective func-

tioning of the economy [11]. Samarasinghe (2022) points out that banks represent one of the main components of the financial system [12]. Banks are extremely dynamic financial institutions, and crises typically have an effect on their profits [13]. Bank profitability is a predictor of crises [14] and a crucial subject of interest in the banking community, even more so with the development and rise of other financial institutions that are taking some part of the market profit. On the other side, from the point of view of the whole economy, bank profitability is enhancing economic growth [15]. Therefore, banks cannot afford inefficiency [16–18] in creating profitable opportunities. Studies that have addressed the issue of profitability determinants have had different approaches. Some of them have considered bank-specific profitability determinants, while some of them considered macroeconomic determinants; there are some studies considering both. In this research, the bank-specific determinants of banks' profitability were bank size, capital adequacy ratio, loan-to-deposit ratio, non-performing loans to total loans and interest rate spread.

Bank size is the one of the most frequently considered bank-specific determinants, and Kumar et al. (2022) point it out as one of the key drivers of banks' profitability [19]. Large banks are expected to be more profitable because of the economy of scale [20]. These banks have better access to a wider range of funding sources and finer cost management techniques to diversify their portfolios [21]. On the other hand, small banks struggle with higher costs, and therefore it is expected that they will be less profitable. Bank size also affects stock returns [22]. Demirguc-Kunt and Huizinga [23] have shown that bank size is negatively correlated to bank stock volatility, and high-income countries have more volatile returns. However, the findings regarding the impact of bank size on bank's profitability are divided. Some studies have shown a positive relationship [24–28] between bank size and profitability, and others have shown the opposite. Koutsomanoli-Filippaki et al. [29] have investigated, using a sample of 25 European Union member states from 1998 to 2008, whether the size of the bank affects its profit efficiency. Their results indicate a negative relationship between the determinants mentioned, showing that smaller banks appear to be more profit-efficient than larger banks. Pasiouras and Kosmidou [30] investigated the determinants of domestic and foreign banks' profitability on a sample of banks operating in the European Union over the period from 1995 to 2001. Their results indicate that there is a negative relationship between bank size and banks' profitability in both cases.

Athanasoglou, Brissimis, and Delis [31] considered bank-specific, macroeconomic, and industry-specific determinants using GMM (General Method of Moments) to a panel of Greek banks for the period from 1985 to 2001. They showed that, among other considered bank-specific determinants, capital had a positive and significant impact on bank profitability. Dietrich and Wanzenried [24] have shown using a sample of low-, middle-, and high-income countries that, in all three cases, the capital ratio has a positive and significant impact on commercial banks' profitability. Demirguc-Kunt and Huizinga [23] examined a sample of 1334 banks in 101 countries during the period of the financial crisis and concluded that equity expressed as a capital ratio has a positive impact on banks' profitability expressed as true return on assets (ROA). The positive impact of the capital adequacy ratio has also been proven by Petria, Capraru, and Ihnatov [32], Berger [28], Saona [33], Căpraru and Ihnatov [34], Dietrich and Wanzenried [24], Djalilov and Piesse [26], Djalilov [26], and Junttila and Nguyen [21]. Conversely, Goddard et al. [27] associated the capital ratio with lower return possibilities. The same negative impact was also shown in CEE countries by Horobet et al. [35].

The loan-to-deposit ratio is the ratio between bank loans and total deposits. If this ratio is lower, the bank relies on its own sources of finance without additional borrowings. Conversely, if this ratio is higher, that means that the bank is using other sources of finance than deposits. This ratio is used to show the liquidity risk exposures. Davis et al. [11] investigated the effects of macro-prudential policy on bank profitability, using a sample of 7250 global banks over the time period of 1990–2018. Their findings show that the loan-to-deposit ratio has a positive and significant impact on return on average assets (ROAA) and return on average equity (ROAE) for all countries considered. The same

positive impact of this ratio on the banks' profitability was shown by Korytowski [36] on a sample of 4179 European commercial banks for the period between 2011 and 2015. For the same geographic area, the EU27, but for the years before and after the financial crisis, from 2004 to 2011, Petria et al. [32] show a negative relationship between the loan-to-deposit ratio and banks' profitability.

The quality of bank assets, precisely, the bank loan portfolio, is shown by the ratio of NPL (Non-Performing Loans), which is calculated as the ratio of non-performing loans to total bank loans. Higher levels of this ratio indicate a low quality of the loan portfolio which brings a delay in the collection of claims. Adalessossi [37] indicates that problems with the banks' assets quality can have harmful effects on their profitability. Therefore, it is expected that the relationship between this ratio and the banks' profitability is negative. This negative correlation was proven by Athanasoglou et al. [31], Coffinet and Lin [38], and Kanas et al. [39].

Besides the bank-specific profitability determinants, researchers have also considered macroeconomic determinants, notably, inflation, GDP growth, government expenses, gross savings, interest rates, and unemployment. Therefore, the macroeconomic environment in which banks operate can have implications on their behavior and business [40]. Depending on the period, geographical location, and model used, these determinants might differ from research to research.

Inflation is mainly calculated through the customer price index (CPI), which measures the change in prices paid for goods and services. Athanasoglou et al. [31] showed, using a sample of Greek banks for the period from 1985 to 2001, that CPI has a positive impact on banks' profitability measured by return on assets (ROA). Using the same dependent variable, Djalilov and Piesse [26] showed a negative impact of inflation on banks' profitability in early transition countries, but a positive impact in late transition countries. Horobet et al. [35] came to the conclusion that inflation has a positive effect on bank profitability measured by ROA and NIM (Net Interest Margin), but a negative effect on the ratio ROE as a proxy for banks' profitability. Davis et al. [11] have proven a positive impact of inflation on banks' profitability measured by ROAA and ROAE in advanced countries, but conversely, a negative impact was shown in emerging and developing economies. Tan and Floros [41] confirmed that there is a positive relationship between inflation rate and banks' profitability on a sample of 101 banks in China. Petria et al. [32] showed that there is a negative impact of inflation on ROAE, but a positive impact when banks' profitability is considered using ROAA. In both cases, the results do not show the excepted significance level. Coffinet and Lin [38] stress-tested the banks' profitability in France, and they came to the conclusion that inflation affects the banks' profitability negatively. The same negative effect was also shown by Korytowski [36] on a sample of 4179 European commercial banks. A positive impact on the sample of banks in Latin America was also shown by Saona [33].

Besides the inflation rate, the GDP growth rate is included in almost all studies. The presumption is that this determinant has a positive impact on banks' profitability. This relationship is proved by Coffinet and Lin [38], Djalilov and Piesse [26] in both considered groups of countries, Davis et al. [11], Petria et al. [32], Guillén et al. [42], Demirguc-Kunt and Huizinga [23], Korytowski [36]. Le and Ngo [43] proved a positive impact on banks' profitability measured by ROA, but when using NIM as banks' profitability measure, the results showed a negative impact. Căpraru and Ihnatov [34] also came to divided results. They proved a positive relationship between GDP growth and banks' profitability expressed through ROA and NIM, but, when using ROE, this relationship was negative. Saona [33] expressed profitability in Latin American banks through four different measures of the net interest margin and came to the conclusion that there was a negative relationship in all four models. Chronopoulos et al. [44] measured the impact of GDP growth on banks' profitability of US banks in four periods of time: (1) 1984–2010; (2) 1984–1993; (3) 1994–1998; (4) 1999–2010. The results showed that, in the first and third listed period, a positive relationship was proven, and in the second and fourth period a negative correlation was shown. Dietrich and Wanzenried [24] have considered determinants of the banks'

profitability in low-, middle-, and high-income countries and their results suggest that there is a negative impact of GDP growth on banks' profitability expressed by ROAE in low- and high-income countries, and a positive impact in middle-income countries. Pasiouras and Kosmidou [30] came to the conclusion that GDP growth has a positive impact on banks' profitability in the case of domestic banks, but contrary to this, in the case of foreign banks, this impact is negative.

The budget deficit of some countries and government expenditure could be an important determinant of banking system activities. It can be assumed that higher expenditures and budget deficit could cause a decline in the profitability of the banking sector in the long term. Horobet et al. [35] considered the effect of the public deficit on the banks' profitability, and they showed a negative impact on all three measures of the banks' profitability (ROA, ROE, NIM). Djalilov and Piesse [26] used government spending among other previously mentioned determinants, to analyze the banks' profitability determinants in the early transition countries of Central and Eastern Europe (CEE), and in the late transition countries of the former USSR. Their results show that government spending has a positive effect on banks' profitability in early transition countries and a negative effect in late transition countries using GMM regression. When using a random effects model, government spending negatively impacts the banking system's profitability in both groups of countries.

Gross saving and economic growth are tightly linked across countries [45]. This determinant shows the part of the gross disposable income that is not spent as final consumption expenditure. Uremadu [46] has shown a negative correlation between gross savings and banks' profitability on a sample of Nigerian banks for the period 1980–2006. Chowdhury [47], using a sample of 11 Islamic banks in Malaysia with annual data from the period 2007–2013, showed that gross savings to gross national income has a negative influence on ROA as a measure of banks' profitability.

The interest rate spread has a vital role on banks profitability. If the interest rate of banks that generate income is higher in comparison to the rate they pay on deposits, the net interest margin will increase, and thus so will the profitability of banks. Real interest rate is a nominal interest rate corrected by the inflation rate. Kanas et al. [39] have shown that the change in short term interest rates has a positive impact on banks' profitability in the US banking sector using a semi-parametric empirical model. Elekdag et al. [1] state that a higher interest rate in the long term could jeopardize the banks' profitability. Carbó Valverde and Rodríguez Fernández [48] have shown that interest rate risk is positively influencing banks margins and their specialization. Coffinet and Lin [38] showed a positive impact of the interest rate spread on the banks' profitability in France in the period from 1993 to 2009. Pesola [49] indicates that real interest rates contribute to the distress in the banking sector.

Unemployment rate is a crucial determinant that is tightly connected to the health of the economic system [50], and the banking system that operates within the given economic system. Unemployment does not directly influence profitability, but it is a major cyclical indicator [51]. Horobet et al. [35] investigated the determinants of banking profitability in the banking sector of the CEE countries based on a Generalized Method of Methods (GMM) approach using a sample of data from between 2009 and 2018. They showed a negative impact of the unemployment rate on the banks' profitability as measured by ROA, ROE, and NIM. The negative impact was proven in all three models. Hefferman and Fu [52] proved the same negative effect in three different models on the sample of Chinese banks from 1999–2006. As profitability measures, they used Economic Value Added, ROAE, and ROAA. Abreu and Mendes [53] proved the same negative effect on the sample of banks operating in Portugal, Spain, France, and Germany. The same proof has been provided by Pesola [49] for the Nordic countries, Belgium, Germany, Greece, Spain, and the UK.

2.2. Determinants of Banks' Liquidity

The global economic crisis of 2008 motivated authors worldwide to investigate the factors that influence bank liquidity. These factors can be divided into two categories: internal, bank-specific factors, i.e., microeconomic level; and external, macroeconomic determinants.

In numerous research papers [54–59] different variables have been used to examine their influence on bank liquidity in one country or in a region. For example, Al-Harbi [54] conducted a comprehensive study with nearly 700 banks for 19 years and examined the difference in factors that significantly influence bank liquidity in developing and less developed countries. It was concluded that the capital ratio, foreign ownership, credit risk, GDP growth, inflation, monetary policy, and deposit insurance have negative correlations with banks' liquidity. Conversely, profitability, size, efficiency, off-balance sheet, and market capitalization were positively related. In another research, Munteanu [55] analyzed factors that influenced banks' liquidity in Romania before and after the financial crisis in 2008 using a multiple regression model. It was shown that the Z-score is an important factor for bank stability and had a significant influence in the crisis years. Similarly, Vodova [56] tried to identify factors of liquidity among Hungarian commercial banks. In this paper, bank liquidity is positively related to capital adequacy, interest rate on loans, and bank profitability, and negatively related to the size, interest margin, monetary policy interest rate, and the interest rate on interbank transactions. Passmore and Temesvarz found a negative relationship regarding the capital ratios and bank liquidity [60]. Gupta et al. [61] came to the results of an U-shaped bi-directional relationship between bank capital and liquidity on the sample of commercial banks from the Asia Pacific region. A recent study in Bangladesh [57] revealed that capital adequacy and the business cycle have a significant impact on banks' liquidity. A comprehensive study [58] used two different liquidity measures, four bank-specific factors, and three macroeconomic factors to measure and compare banks' liquidity in the Middle East Region. The analysis highlights the significant impacts of economic growth, assets quality, capital level, and bank size on liquidity in the banking sector. In another paper [59], the relationship between liquidity risk and bank specific factors (size, capitalization, assets quality, and specialization) in Eurozone banks has been analyzed. The results show that larger banks have higher liquidity risk exposure and banks with higher capitalization have better liquidity in the long term. The assets' quality has a significant impact on the measure of the short-term liquidity risk.

Macroeconomic determinants affect bank liquidity [62]. The most commonly used macroeconomic factors related to bank liquidity are gross domestic product growth and inflation rate. Many studies have confirmed that gross domestic product and inflation are significant predictors of bank liquidity [58,63–67]. When it comes to the positive effect of GDP on bank liquidity, Tran et al. [67] analyzed bank liquidity through the ratio of loans to total assets, and their results confirmed a significant and positive effect of the GDP growth rate on bank liquidity in the sample of U.S. banks from 1996 to 2013. Similarly, Berger and Sedunov [63] identified a significant relationship between liquidity creation and gross domestic product. El-Chaarani [58] estimated the determinants of bank liquidity in the Middle East region from 2014 to 2016 on a sample of 183 banks. Empirical findings confirmed that GDP has a significant and positive effect on bank liquidity, while inflation and unemployment have a marginal impact on the bank liquidity in the analyzed region. Likewise, Pham and Pham [65] confirmed the positive effects of gross domestic product and inflation on the bank liquidity in Vietnam for the period 2007–2018. In addition to the positive effect of GDP, inflation rate can also have lucrative implications for bank liquidity. Chen et al. [64] measured bank liquidity risk and performance in twelve developed countries (Australia, Canada, France, Germany, Italy, Japan, Luxembourg, The Netherlands, Switzerland, Taiwan, United Kingdom, and the United States) for the period 1994–2006. Their results found that annual percent changes in gross domestic product and inflation positively affected the bank liquidity risk in these economies.

On the other hand, GDP and inflation can negatively affect bank liquidity. Vodova [56] estimated the determinants of commercial bank liquidity in Hungary over the period 2001–2010 and found that inflation negatively affects bank liquidity, while unemployment is not a significant factor for bank liquidity in Hungary. Moussa [68] examined liquidity determinants of 18 banks in Tunisia for the period 2000–2010 and found that the GDP growth rate and inflation rate have negative effects on bank liquidity. Further, Sheefeni and Nyambe [69] researched the macroeconomic determinants of commercial banks' liquidity in Namibia for the period 2001–2014. Applying the ECM (Error Correction Model) model, their study found that gross domestic product and inflation have significant, but different effects on bank liquidity. Namely, GDP positively affects bank liquidity, while a higher inflation rate causes smaller bank liquidity in the observed period. Al-Harbi [54] investigated the determinants of 686 banks' liquidity operating in the Organization of Islamic Cooperation countries for the period 1989–2008. This study calculated bank liquidity by using the ratio of loans to total assets, and, using the ordinary least-square fixed effect model, empirical findings confirmed that GDP growth and inflation significantly and negatively affect bank liquidity. Specifically, Ghenimi et al. [70] found that the GDP growth rate and inflation rate had a negative impact on bank liquidity in the MENA region for the period 2005–2015. These findings are in line with the study by Yitayaw [71] that estimated determinants of 15 commercial banks' liquidity in Ethiopia for the period 2009–2019. Empirical results of GMM estimation showed that GDP growth rate significantly and negatively affects bank liquidity measured by the loans-to-deposit ratio.

Based on the above-mentioned, gross domestic product and inflation can be identified as main macroeconomic determinants for bank liquidity. Additionally, the unemployment rate can be significant when considering bank liquidity. A higher unemployment rate implies a lower capability to repay debt which leads to the deterioration of the bank profitability [72]. Munteanu [55] analyzed bank liquidity in Romania through two ratios such as net loans to total assets and liquid assets to deposits and short-term funding. This study showed that inflation rate and unemployment significantly affect the bank liquidity only in the case of the second liquidity ratio. Trenca et al. [73] examined the effects of macroeconomic determinants on 40 commercial banks liquidity in Greece, Portugal, Spain, Italy, Croatia, and Spain for the period 2005–2011. Their results of GMM panel confirmed that gross domestic product, inflation, and unemployment rate significantly affect bank liquidity. This study concluded that inflation rate has the highest effect on bank liquidity, whereas gross domestic product has the least impact on liquidity ratio. The study of Singh and Sharma [74] reported a positive relationship between unemployment rate and bank liquidity which is in line with Mazreku et al. [75]. Likewise, Mdaghri and Oubdi [76] measured bank liquidity creation within a sample of 153 banks in MENA countries for the period 2008–2017. Their findings indicated that inflation and unemployment are significant predictors of bank liquidity. On the one side, Fatimah Yacoob et al. [77] highlighted that banks raise their liquidity position to protect deposits in inflationary conditions, which is in line with Abdul-Rahman et al. [78] who registered a significant positive relation between inflation and liquidity risk. However, Cucinelli [59] investigated the liquidity determinants of 1080 banks in the Eurozone for the period. Conversely, inflation had a negative impact on bank liquidity, but it was not significant, which is in line with Horvath et al. [79].

To summarize which determinants were used in previously conducted studies, the following Table 1 shows the authors of the studies, samples, periods of the undertaken studies, and the used determinants, with the eventual explanation of the results.

Table 1. Summarized previous studies with identified determinants of bank profitability and liquidity.

Authors	Profitability or Liquidity	Sample	Period	Variables and Results
Petria, Capraru, and Ihnatov (2015) [32]	Profitability	EU27	2004–2011	Bank size (+/−), Capital Adequacy (+), Credit Risk (−), Management Efficiency (−), Liquidity Risk (−), Market Concentration (−), Inflation (+/−), Economic Growth (+).
Djalilov and Piesse (2016) [26]	Profitability	CEE and in the late transition countries of the former USSR	2000–2013	Capital (+), Credit risk (+ in early transition; − in late transition countries), Cost (+), Size (− in early transition; + in late transition countries), HHI (− in early transition; + in late transition countries), GDP growth (+), Inflation (− in early transition; + in late transition countries), Government spending (+ in early transition; − in late transition countries), Fiscal freedom (−), Monetary freedom (+ in early transition; − in late transition countries).
Dietrich and Wanzenried (2014) [24]	Profitability	10,165 commercial banks across 118 countries	1998–2012	Capital ratio, Cost-to-income ratio, Loan loss provisions, Growth deposits, Bank size, Interest income share, Funding costs, Bank ownership, Nationality, Effective tax rate, Inflation, GDP growth, GDP per capita, Stock market capitalization to GDP, Bank concentration, financial crisis. They divided their results according to the groups of countries by income.
Horobet, Radulescu, Belascu, and Dita (2021) [35]	Profitability	CEE	2009–2018	Domestic credit to private sector, Non-performing loans, HHI, Solvency ratio, Public deficit/surplus, Inflation rate, Unemployment rate. Their results differ depending on the used dependent variables which are ROA, ROE and NIM.
Athanasoglou, Brissimis and Delis (2008) [31]	Profitability	Greek banks	1985–2001	Capital, Credit risk, Productivity growth, Operating expenses, Size, Ownership, Concentration, HHI, Inflation expectations, Cyclical output.
Dietrich and Wanzenried (2011) [80]	Profitability	372 commercial banks in Switzerland	1999–2009	Capital adequacy, Cost-income ratio, Loan loss provisions over total loans, Yearly growth of deposits, Difference between bank and market growth of total loans, Bank size, Interest income share, Funding costs, Bank age, Bank ownership, Nationality, Effective tax rate, Real GDP growth, Herfindahl index. Their results show the determinants of banks' profitability for all years, pre-crisis years from 1999–2006 and post crisis years from 2007–2009.
Yitayaw (2021) [71]	Liquidity	15 commercial banks in Ethiopia	2009–2019	Bank size, profitability, deposit, capital adequacy ratio, loan growth, interest rate margin, GDP.
Trenca, Petria, and Corovei (2015) [73]	Liquidity	40 commercial banks in Greece, Portugal, Spain, Italy, Croatia and Cyprus	2005–2011	GDP, inflation, unemployment, public deficit.
Al-Harbi (2017) [54]	Liquidity	686 banks in Organization of Islamic cooperation countries	1989–2008	Capital ratio, credit risk, ownership, deposit insurance, efficiency, bank size, market capitalization, inflation, monetary policy.

Table 1. *Cont.*

Authors	Profitability or Liquidity	Sample	Period	Variables and Results
El-Chaarani (2019) [58]	Liquidity	183 banks in Middle East countries	2014–2016	Bank size, profitability, asset quality, capitalization, GDP, inflation, unemployment.
Chen, Shen, Kao, and Yeh (2018) [64]	Liquidity	Banking sector in Australia, Canada, France, Germany, Italy, Japan, Luxembourg, The Netherlands, Switzerland, Taiwan, United Kingdom, United States	1994–2006	Bank size, profitability, capital ratio, GDP, inflation.
Munteanu (2012) [55]	Liquidity	27 Romanian commercial banks	2002–2010	Capital Adequacy, Assets Quality, Interbank Funding, Funding Cost, Cost to income ratio, Interest rate, Credit risk rate, Inflation rate, GDP real growth rate, Unemployment. Z-score is an important factor for bank stability and has a significant influence in the crisis years.
Tasnova (2022) [57]	Liquidity	29 commercial banks in Bangladesh	2014–2019	Nonperforming loans, Capital Adequacy Ratio, Return on Assets, Gross Domestic Product, Monetary Policy Interest Rate, Interest Rate Spread. Capital Adequacy Ratio, Gross Domestic Product and Interest Rate Spread have significant influence on banks' liquidity.
Vodová (2013) [56]	Liquidity	Hungarian banks	2001–2010	Share of equity on total assets, share of non-performing loans, share of net profit on banks' equity, the logarithm of total assets of the bank, a dummy variable for the financial crisis, the growth rate of gross domestic product, inflation rate, the interest rate on interbank transactions, the interest rate on loans, difference between the interest rate on loans and interest rate on deposits, monetary policy interest rate, unemployment rate. Bank liquidity increases with higher capital adequacy of banks, higher interest rate on loans, and higher bank profitability. Bank liquidity decreases with the size of the bank, interest margin and monetary policy interest rate.
Cucinelli (2013) [59]	Liquidity	1080 Eurozone banks	2006–2010	Bank size, the measure of asset quality, bank capitalization, the measure of bank specialization, liquidity coverage ratio, net stable funding ratio, gross domestic product rate, inflation rate, dummy of listed or no listed banks, and financial crisis dummy. All variables, except the dummy regard to the listed banks, significantly influence the short-term liquidity measure. The size of the bank significantly influences liquidity risk exposure. Banks with higher capitalization have better liquidity in the long term.
Singh, A., Sharma, A.K. (2021) [74]	Liquidity	59 Indian commercial banks	2000–2013	Bank size, profitability, funding cost, deposit, capital adequacy ratio, inflation, GDP, unemployment. Mentioned variables does affect bank liquidity.

Source: Authors.

3. Data and Methodology

The data used in this study were obtained from the World Bank Open Data database and the database of the National Banks of each considered country. We used aggregate data for the period from 2007 to 2022 for all West Balkan countries, i.e., Serbia, North Macedonia, Albania, Montenegro, and Bosnia and Herzegovina. The reason this period is used and not the period before 2007 is that, until 2006 Serbia and Montenegro were a unified state, and there are no data available in the database separate for these countries. The determinants used to explain the variations in the dependent variables are shown in the table below. The determinants were chosen to match the determinants used in both groups of studies, both profitability and liquidity studies, which is shown in Table 2.

Table 2. Variables and their explanation.

Variable Symbol	Measurement	Source
Dependent variables		
ROA	Return on assets—measured as net income divided by total assets	National banks
ROE	Return on equity—measured as net income divided by banks' equity	National banks
Liquidity	Liquid reserve to banks' total assets expressed as a ratio	World Bank Open Data database
Independent variables		
Total assets	Total bank assets. Values were logarithmized.	National banks and World Bank Open Data database
CAR	Capital adequacy ratio—measured as a bank's capital divided by its risk-weighted assets. Values were logarithmized.	National banks and World Bank Open Data database
Loan-to deposit	The loan-to-deposit ratio is the ratio between bank loans and total deposits.	National banks and World Bank Open Data database
NPL to total loans	This is the ratio that puts into relation the non-performing loans of the bank with the total granted loans.	National banks and World Bank Open Data database
CPI	Customer price index. Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is used. *	World Bank Open Data database
Expense % of GDP	Expense is cash payments for operating activities of the government in providing goods and services. It includes compensation of employees (such as wages and salaries), interest and subsidies, grants, social benefits, and other expenses such as rent and dividends. *	World Bank Open Data database
GDP per capita growth	Annual percentage growth rate of GDP per capita based on constant local currency. GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for the depreciation of fabricated assets or for the depletion and degradation of natural resources. *	World Bank Open Data database
Gross savings as % GDP	Gross savings are calculated as gross national income minus total consumption, plus net transfers. *	World Bank Open Data database
Unemployment	Calculated as a percentage of total labor force. Unemployment refers to the share of the labor force that is without work but available for and seeking employment. *	World Bank Open Data database

Source: Authors. * World Bank Open Data database definition.

The present study analyses the determinants of liquidity and profitability using a balanced panel data model. The choice of the panel data model before the pooled ordinary least square model was made due to the specific banking effects through cross-section heterogeneity and by enhancing the robustness of the estimated values [81]. In this case, it is assumed that the panel least squares method with fixed or random time effects will be used. The main functional form of the studied models is presented as follows:

Profitability = f (bank specific variables; macroeconomic variables)

Liquidity = f (bank specific variables; macroeconomic variables)

If these functional forms are expressed by the proposed variables, then the models can be presented in the following way:

$$ROA_{it} = \alpha + \beta_1 \ln TA_{it} + \beta_2 LOAN_{it} + \beta_3 \ln CAR_{it} + \beta_4 NPL_{it} + \beta_5 CPI_{it} + \beta_6 EXP_{it} + \beta_7 GDP_{it} + \beta_8 GS_{it} + \beta_9 IRS_{it} + \beta_{10} RIR_{it} + \beta_{11} UN_{it} + \varepsilon_{it} \quad (1)$$

$$ROE_{it} = \alpha + \beta_1 \ln TA_{it} + \beta_2 LOAN_{it} + \beta_3 \ln CAR_{it} + \beta_4 NPL_{it} + \beta_5 CPI_{it} + \beta_6 EXP_{it} + \beta_7 GDP_{it} + \beta_8 GS_{it} + \beta_9 IRS_{it} + \beta_{10} RIR_{it} + \beta_{11} UN_{it} + \varepsilon_{it} \quad (2)$$

$$LIQ_{it} = \alpha + \beta_1 \ln TA_{it} + \beta_2 LOAN_{it} + \beta_3 \ln CAR_{it} + \beta_4 NPL_{it} + \beta_5 CPI_{it} + \beta_6 EXP_{it} + \beta_7 GDP_{it} + \beta_8 GS_{it} + \beta_9 IRS_{it} + \beta_{10} RIR_{it} + \beta_{11} UN_{it} + \varepsilon_{it} \quad (3)$$

ROA, ROE, and LIQ are dependent variables, i is a symbol that represents the cross-section data (i-th country), t represents the time (annual data), α is an intercept coefficient, βj shows a slope coefficient next to each of the independent variable (ln(TA), LOAN, ln(CAR), NPL, CPI, EXP, GDP, GS, IRS, RIR, and UN) and ε represents the error term. In this paper, logarithmic values of total assets and CAR are used instead of their absolute values due to the potential problem of multicollinearity among independent variables.

Using a panel regression model raises the question of implementing a model with fixed or random effects. In such situations, the application of a specification test based on the differences between the fixed effects and random effects estimators, known as the Hausman test, is suggested. If the null hypothesis is true, the fixed effect estimator is not efficient under the random effect specification because it counts only on the within variation in the data series. Another option would be the Breusch–Pagan Lagrange Multiplicator test, used to determine whether the random effects are significant in the panel data model. This test follows the chi-square distribution and suggests that, if the null hypothesis is rejected, it can be concluded that the random effects are significant in the model.

Based on defined objective of the research, two auxiliary hypotheses were developed concerning the general hypothesis, with five and six sub-hypotheses for each of the auxiliary hypotheses.

H_1: *The same determinants affect banks' profitability and liquidity in West Balkan countries.*

$H_{1.1}$: *Bank-specific determinants significantly affects banks' profitability and liquidity in West Balkan countries.*

$H_{1.1.1}$: *Bank size positively affects banks' profitability and liquidity in West Balkan countries.*

$H_{1.1.2}$: *Capital adequacy ratio positively affects banks' profitability and liquidity in West Balkan countries.*

$H_{1.1.3}$: *Loan-to-deposit ratio negatively affects banks' profitability and liquidity in West Balkan countries.*

$H_{1.1.4}$: *Non-performing loans negatively affect banks' profitability and liquidity in West Balkan countries.*

$H_{1.1.5}$: *Interest rate spread negatively affects banks' profitability and liquidity in West Balkan countries.*

$H_{1.2}$: *Macroeconomic determinants significantly affect banks' profitability and liquidity in West Balkan countries.*

$H_{1.2.1}$: *The consumer price index positively affects banks' profitability and liquidity in West Balkan countries.*

$H_{1.2.2}$: *Gross savings positively affects banks' profitability and liquidity in West Balkan countries.*

$H_{1.2.3}$: *Real interest rate negatively affects banks' profitability and liquidity in West Balkan countries.*

$H_{1.2.4}$: *GDP growth positively affects banks' profitability and liquidity in West Balkan countries.*

$H_{1.2.5}$: *Government expenditures positively affect banks' profitability and liquidity in West Balkan countries.*

$H_{1.2.6}$: *Unemployment rate negatively affects banks' profitability and liquidity in West Balkan countries.*

The design of the study can be shown as follows in Figure 1:

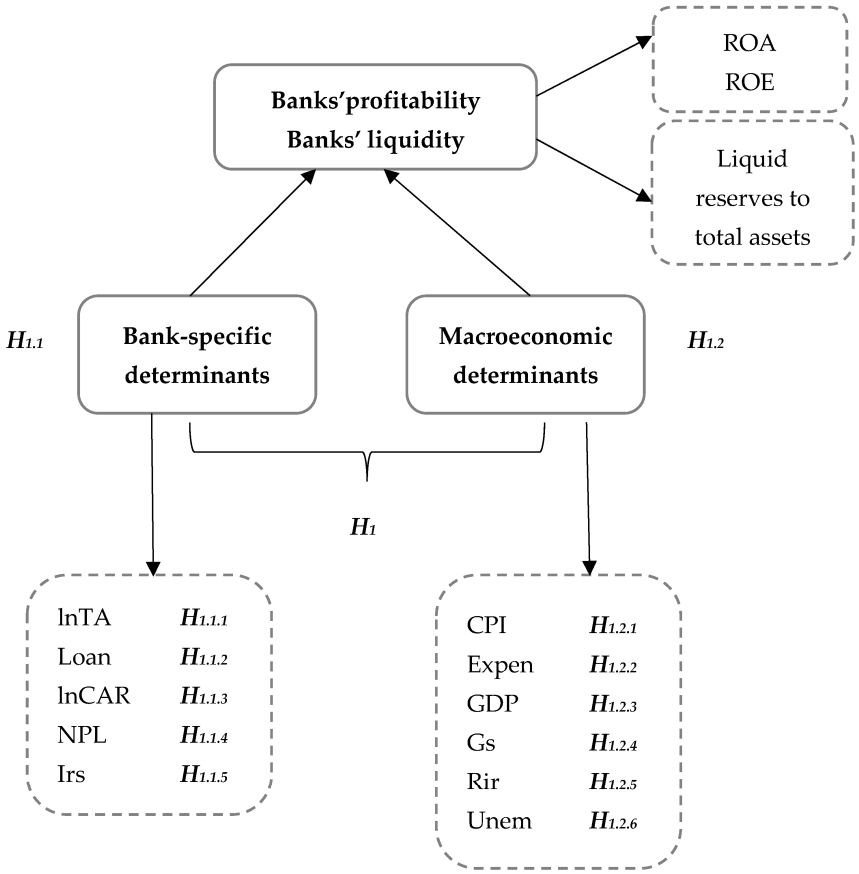

Figure 1. Design of the research.

4. Results and Discussion

This section of the paper presents descriptive statistics and results of stationarity testing, the multicolinearity test, the heteroscedasticity test, and panel data models such as the random effects model and fixed effects model. The following tables present the results of the conducted empirical analysis. Additionally, it is worth mentioning that the research was conducted using EViews 12 software.

Table 3 presents the descriptive statistical values for all proposed variables for the number of observations (30). The values from Table 3 are applied to estimate the banks' profitability and liquidity performance in West Balkan countries overall. Table 3 also contains the results of the Augmented Dickey–Fuller test (ADF test), which involves testing a data series for the existence of a unit root. This sort of test makes it possible to reveal the stationarity of the panel data series themselves, and therefore, when implementing them in the panel model, more reliable results are obtained. The results of the test in Table 3 reveal that the original data set is stationary due to the rejection of the null hypothesis, which concludes the presence of a unit root in panel series. In addition, Table 3 also contains the results of testing the normality of individual variables. In most cases, the results show that the hypothesis of a normal distribution of the data series is not confirmed. Considering the

panel data, this statement is not a surprise, because, through the application of the ordinary least squares panel methodology, they become resistant to deviations from this assumption, especially in the case of fixed effects models.

Table 3. Descriptive statistics and unit root testing.

Variable	Mean	Median	Standard Deviation	Maximum	Minimum	ADF Test	Skewness	Kurtosis	Jarque–Bera Test
Liq	22.564	22.222	6.543	41.032	8.168	17.574	0.426	3.515	3.314
ROA	0.744	0.744	0.917	2.341	−4.342	11.852	−2.304	5.212	90.011
ROE	5.828	5.978	7.935	21.635	−41.220	11.725	−2.791	6.114	140.213
ln(TA)	16.174	15.012	3.178	22.392	12.318	10.558	0.888	−0.538	52.239
Loan	92.675	90.173	20.689	156.793	51.317	19.939	0.523	3.337	4.032
ln(CAR)	2.416	2.315	0.338	3.153	1.946	11.055	1.193	−0.004	49.067
NPL	10.904	10.213	5.815	22.244	2.989	19.325	0.431	2.061	5.417
CPI	3.203	2.030	3.737	14.205	−1.584	10.678	1.508	4.601	38.869
Expen	24.704	19.796	11.182	44.545	10.379	18.659	0.247	1.423	9.104
GDP	3.291	3.452	3.992	12.815	−15.208	44.268	−1.295	5.327	40.396
Gs	16.109	16.430	8.117	32.716	−8.290	13.499	0.251	3.476	1.597
Irs	4.656	4.683	1.422	8.441	1.950	11.031	0.065	2.449	1.069
Rir	3.989	3.805	3.425	10.843	−5.894	10.412	0.011	2.417	1.133
Unem	16.976	17.605	9.302	35.230	1.275	12.376	−0.169	2.239	2.311

Source: Authors' estimations.

According to the methodology, it is necessary to analyze the interrelationship of the proposed variables to identify the most significant factors affecting the liquidity and profitability of the banking sector. In this regard, in the first phase, a correlation matrix with data on simple correlation coefficients between two variables was offered. This is an important step since potential multicollinearity could skew the results [82].

The results from the correlation matrix (Table 4) indicate that there is no significant concern as regards multicollinearity, because there are no (except in a few cases) strong correlations between independent variables.

Table 4. Correlation matrix of proposed variables and variance inflation factors test results.

Variable	Liq	ROA	ROE	ln(TA)	Loan	ln(CAR)	NPL	CPI	Expen	GDP	Gs	Irs	Rir	Unem
Liq	1													
ROA	0.380	1												
ROE	0.225	0.938	1											
ln(TA)	0.386	0.115	0.094	1										
Loan	−0.004	−0.446	−0.538	0.029	1									
ln(CAR)	0.434	0.245	0.019	0.854	0.161	1								
NPL	−0.221	−0.426	−0.471	0.177	0.141	0.110	1							
CPI	0.273	0.175	0.066	0.302	0.065	0.308	−0.002	1						
Expen	0.424	0.006	−0.159	0.841	0.465	0.681	0.036	0.138	1					
GDP	0.154	0.226	0.238	0.041	−0.213	−0.019	−0.210	0.341	−0.017	1				
Gs	0.277	0.490	0.547	0.024	−0.618	0.044	−0.352	−0.086	−0.288	0.141	1			
Irs	−0.411	−0.299	−0.183	−0.415	−0.073	−0.492	0.446	−0.019	−0.604	−0.066	−0.312	1		
Rir	−0.473	−0.320	−0.215	−0.537	−0.065	−0.457	0.423	−0.424	−0.462	−0.365	−0.003	0.490	1	
Unem	0.253	−0.160	−0.189	−0.032	0.618	0.144	−0.089	−0.067	0.370	−0.115	−0.055	−0.318	−0.030	1

Source: Authors' estimations.

In each of the presented panel models (Tables 5–7), independent variables are applied with various combinations and noted as significant factors that determine the liquidity and profitability of the banking sector. As can be seen in Tables 5–7, some of the independent variables were omitted from the model for strictly statistical or practical reasons. The models shown are consistent with the data, as they have R-squared values above 50%. The F-statistic results indicate that the parameters' coefficients are jointly significant at the significance level of 1%. According to the previous statements related to the results from the correlation matrix, the variance inflation (VIF) test was performed and the results confirm that there is no statistically significant multicollinearity between the independent

variables (VIF test values below 10). This is in line with Batrancea et al. (2021) [83], who highlight that there is a problem of multicollinearity if VIF exceeds 10.

Table 5. Results of the panel model—determinants of return on assets (ROA).

Variable	*Coefficient*	*t-Statistic*	*VIF Test*
Intercept	*−0.3887*	*1.8144 **	-
Ln(Total assets)	*0.0916*	*1.97241 **	*5.2369*
Loan-to deposit	*−0.0099*	*−2.3214 ***	*1.8680*
Ln(CAR)	*0.0073*	*2.2698 ***	*2.2745*
NPL to total loans	*−0.0546*	*−1.824 **	*1.8059*
CPI	*0.0882*	*1.7463 **	*1.4897*
Gross savings	*0.0042*	*2.3254 **	*3.2051*
Real interest rate	*−0.0479*	*1.7244 **	*2.4770*
R-squared		*0.6515*	
F-statistic		*4.8451 ****	
Hausman test (χ^2)		*16.0594 ****	
Breusch–Pagan LM test		*1.8811*	
Breusch–Pagan–Godfrey (F test)		*1.3697*	
Jarque–Bera test		*1.4027*	

Source: Authors' estimations. Note: ***, **, and * indicate significance at the level of 1%, 5%, and 10%, respectively.

Table 6. Results of the panel model—determinants of return on equity (ROE).

Variable	*Coefficient*	*t-Statistic*	*VIF Test*
Intercept	*5.4269*	*1.6188 **	-
Ln(Total assets)	*0.8188*	*1.8755 **	*6.9058*
Loan-to deposit	*−0.1068*	*−3.1588 ****	*3.0081*
Ln(CAR)	*3.4116*	*2.4189 ***	*4.8221*
NPL to total loans	*−0.4352*	*−4.3971 ****	*1.5289*
Gross savings	*0.4579*	*2.4707 ***	*2.4717*
Interest rate spread	*−0.8568*	*−1.7312 **	*3.8266*
R-squared		*0.5098*	
F-statistic		*11.8383 ****	
Hausman test (χ^2)		*10.7609*	
Breusch–Pagan LM test		*44.0087*	
Breusch–Pagan–Godfrey (F test)		*1.3482*	
Jarque–Bera test		*5.0655*	

Source: Authors' estimations. Note: ***, **, and * indicate significance at the level of 1%, 5%, and 10%, respectively.

Table 7. Results of the panel model—determinants of liquid reserves to bank assets.

Variable	*Coefficient*	*t-Statistic*	*VIF Test*
Intercept	*−11.6056*	*−2.6855 ****	-
Ln(Total assets)	*0.5578*	*2.5144 ***	*7.1168*
Ln(CAR)	*4.7323*	*2.4006 ***	*2.3072*
NPL to total loans	*−0.5684*	*−2.9062 ****	*2.0581*
CPI	*0.7882*	*2.5023 ***	*1.4433*
Expense % of GDP	*0.2124*	*3.3378 ****	*3.8009*
GDP per capita growth	*0.33403*	*1.4580 **	*2.0508*
Gross savings	*0.4193*	*4.0722 ****	*1.9357*
Interest rate spread	*−1.3583*	*−1.8723 **	*2.8897*
Unemployment	*0.4955*	*3.8041 ****	*1.7107*
R-squared		*0.7027*	
F-statistic		*5.4158 ****	
Hausman test (χ^2)		*32.0599 ****	
Breusch–Pagan LM test		*1.5073*	
Breusch–Pagan–Godfrey (F test)		*1.8210*	
Jarque–Bera test		*0.6897*	

Source: Authors' estimations. Note: ***, **, and * indicate significance at the level of 1%, 5%, and 10%, respectively.

The χ^2 results obtained from the Hausman test suggest that the null hypothesis is rejected and the fixed effect model is appropriate in the case of liquidity and ROA as dependent variables in estimated models (Tables 5 and 7). On the other hand, the null hypothesis is accepted in the case of ROE as a dependent variable, and then the application of a random effect model is suggested (Table 6). Similar results are shown by the Breusch–Pagan LM test, rejecting the hypothesis in the case of ROE as a dependent variable (in Table 6) and accepting the hypothesis in the case of ROA and liquidity (Tables 5 and 7). To improve model fit, the Breusch–Pagan–Godfrey test was also used to detect the heteroscedasticity of the residuals. As the null hypothesis is that there is homoscedasticity of the residuals, only models which fulfilled the stated assumptions were taken into consideration. In all three presented tables, the results of the mentioned test show that there are no problems with the residuals caused by an independent variable. Considering that the majority of applied independent variables are positively asymmetric and some of them are expressed in absolute units, the Jarque–Bera test of residual normality in each of the mentioned models was also examined. As a goodness-of-fit test, the results in each presented model show a statistically significant normal distribution of estimated model residuals.

Regarding the bank-specific determinants, the results show that the bank's profitability, which is measured by return on equity (ROE) and return on assets (ROA), is positively affected by the size of the banking institutions, and the capital adequacy ratio. These findings are in accordance with the previously mentioned studies [24–28] which considered these determinants. We found that the same positive effects of size and capital adequacy ratio are also present in the case of the banks' liquidity. This implies that auxiliary hypotheses $H_{1.1.1}$ and $H_{1.1.2}$ can be accepted. Al-Harbi [54] shares the same results when it comes to the influence of size on banks' liquidity, but in the case of capital adequacy ratio, he shows a negative relationship which is opposite to the findings of this study. The results regarding the size of the banks and the CAR indicate that larger and better-capitalized banks achieve higher levels of profitability, and they manage their liquidity reserves better. According to Basel III, systemically significant banks should set aside larger capital reserves concerning the risk-weighted assets. High profitability seems compatible with greater capital ratios and, hence, lower risk levels [84]. The results of this research are in accordance with the fact that larger, systemically important banks are better capitalized and more profitable, but have also more reserves than smaller banks. The results show a negative impact of the loan-to-deposit ratio and the non-performing loans-to-total loans ratio on ROA and ROE, while banks' liquidity is negatively affected by the non-performing loans to total loans ratio. This means that higher indebtedness of banks leads to a decline in profitability. Based on this, auxiliary hypotheses $H_{1.1.3}$ and $H_{1.1.4}$ can be partially accepted. The same applies to the NPL ratio, as the higher this ratio is, the lower the profitability and liquidity are. This is an expected outcome, since it is anticipated that low-quality placements that are risky will negatively affect the profitability in the long term, and liquidity in general both in the short and long term. The findings are in accordance with the findings of Petria et al. [32], as well as those of Athanasoglou et al. [31], Coffinet and Lin [38], and Kanas et al. [39].

Associated with the effects of the macroeconomic determinants, the results show that gross savings and CPI positively affect the banks' profitability as well as liquidity, thus sub-hypotheses $H_{1.2.1}$ and $H_{1.2.2}$ can be accepted. We considered interest rates as a spread and real interest rate in our study which is highly related in praxis, one as bank-specific and the other as a macroeconomic determinant. The interest rate spread negatively affects the banks' profitability expressed through ROE, as well as banks' liquidity. Accordingly, sub-hypothesis $H_{1.1.5}$ can be confirmed. The real interest rate affects only the profitability expressed through ROA. Besides the negative interest rate spread and the mentioned determinants, the liquidity is furthermore positively affected by the GDP growth, government expenditures, and the unemployment rate. Based on the obtained results, sub-hypotheses $H_{1.2.3}$, $H_{1.2.4}$, $H_{1.2.5}$, and $H_{1.2.6}$ can be partially confirmed. The same findings about the impact of GDP growth and CPI are also shared by Tran et al. [67], Berger

and Sedunov [63], and Chen et al. [64]; regarding the unemployment rate, the findings are in line with Singh and Sharma [74], Mazreku et al. [75], and Abdul-Rahman et al. [78].

5. Conclusions and Policy Implications

The results of this study try to fill the gap in the literature regarding the determinants of banks' profitability and liquidity. Namely, previous research looked separately at the determinants of profitability and liquidity, even though both of these principles of business are closely related. The research problem of this study was addressed to determine whether the same determinants affect banks' profitability and liquidity. The findings showed that there is a minor deviation in the determinants in favor of liquidity. More precisely, three macroeconomic factors proved to be significant in terms of liquidity, but not in terms of banks' profitability. This means that auxiliary hypothesis $H_{1.2}$ can be partially confirmed. These determinants are government expenditure, GDP growth, and unemployment rate. In the case of bank-specific determinants, the deviation is in favor of profitability, and only one determinant was proven to be significant in the case of banks' profitability but not in the case of banks' liquidity, and that is the loan-to-deposit ratio. According to this, the auxiliary hypothesis $H_{1.1}$ can be partially accepted. Finally, the obtained empirical results indicate that there are slight differences regarding the effect of internal and external determinants on banks' profitability and liquidity. Taking into account the highlighted deviations, the general hypothesis H_1 cannot be completely accepted.

It is interesting to mention that, although there is a trade-off between profitability and liquidity, the analyzed determinants, except the ones mentioned, significantly affect both banks' profitability and banks' liquidity in the same direction. As far as the practical application of the results is concerned, larger banks that are more capitalized show higher levels of profitability and have sufficient liquid reserves so that their liquidity is not threatened. A careful selection of the loan approval is needed to reduce the NPL ratio that negatively affects both profitability and liquidity.

The macroeconomic determinants in the West Balkan countries were in favor of the banks' profitability and liquidity, since a positive impact has been noted in the considered period. A positive impact of the CPI, as well as the gross savings, is present in both cases. The real interest rate had a negative impact on ROA, but no effect on the ROE or liquidity, but the interest rate spread showed a negative influence on both banks' profitability and liquidity. Besides these, the banks' liquidity was influenced positively by government expenditure, GDP growth, and unemployment rate.

Bank managers, shareholders, clients, and other stakeholders are interested in the successful banking business. The obtained findings related to bank profitability and liquidity determinants can be lucrative for bank managers when defining strategies and policies for the bank. On the one hand, banks in this region will recognize the potential factors for improving profitability and liquidity, but simultaneously, factors with harmful effects on mentioned variables. On the other hand, banks must develop procedures, policies, and strategies according to their macroeconomic environment. Adjusting the policies and portfolios of banks according to the main macroeconomic indicators can have significant benefits for their successful operations. The efficiency of banks can be confirmed through adequate management between liquidity and profitability. The optimal relationship among the above components enables banks to ensure financial stability and security, but also efficiency, by achieving an appropriate profit level.

The results of the study indicate that managers and economic policymakers should keep in mind that both banks' profitability and liquidity are equally influenced by bank-specific determinants. On the other hand, banks' liquidity is more influenced by macroeconomic determinants in comparison to the bank's profitability. To improve the performance of banks in the countries of the Western Balkans, it is necessary to continuously monitor the loan-to-deposit ratio and non-performing loans, i.e., to increase the depository sources of bank financing and reduce the bad placements of banks. As for interest rates, it is necessary

to harmonize the ratio of active and passive interest rates so that it encourages the growth of deposits but does not threaten the liquidity of banks.

This research specifies which determinants are crucial for banks' profitability and liquidity in the sample of West Balkan countries. Research including external determinants enables better interpretation of results, because changes in banks' performance may be problematic to explain without information on the main macroeconomic determinants. The obtained findings will be helpful for banks in West Balkan countries when creating strategies and defining portfolios from the point of view of profitability and liquidity. Tran et al. [85] indicated that greater bank liquidity improves bank stability, but liquid assets commonly have a lower return. Thus, banks would be exposed to potential opportunity costs that would reduce their profitability [86]. Therefore, banks should provide an optimal balance between profitability and liquidity to enable a lucrative business performance. Likewise, bank managers should prudently consider uncertainty's consequences in macroeconomic conditions to avoid adverse effects on banks' performance [87].

The recommendation for further research is to expand the sample to other, developed countries to determine if there is a difference in results between developing and developed countries. Furthermore, the sample could be split so that it considers small and large banks separately.

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