NAVIGATING FINANCIAL PERFORMANCE IN CRISIS: INVESTMENT, LIQUIDITY, AND SOLVENCY OF BANKS DURING THE PANDEMIC

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Abstract

The COVID-19 pandemic has affected both developing and developed economies, reducing the profits of many companies, including commercial banks. This study investigates the impact of the COVID-19 pandemic on the financial performance of commercial banks in Kosovo, focusing on how investment, liquidity, solvency, debt-to-asset ratio (DAR), debt-to-equity ratio (DER), and equity-to-asset ratio (EAR) influenced the return on assets (ROA) of banks during the crisis period. The primary research problem addresses the lack of detailed analysis on the influence of these financial indicators in the context of Kosovo's banking sector, a gap in the existing literature. The purpose of the research is to explore the relationships between these financial indicators and bank performance during the pandemic. The research analyzes the financial reports of seven banks from 2013 to 2021 and uses regression analysis to assess the relationships between financial metrics and ROA. The findings reveal that solvency has a statistically significant positive impact on bank performance, while liquidity and investments show mixed results and less significant results. The study concludes that banks in Kosovo can enhance their resilience and performance by optimizing solvency strategies and carefully managing investments and liquidity. This research fills a gap in the literature and provides valuable insights for academics and practitioners in the field.

Keywords: Commercial Banks, COVID-19 Pandemic, Financial Performance, Return on Assets, Investment, Solvency

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1. INTRODUCTION

Evaluating the financial performance of banks has been extensively researched in economic and financial literature (Capuano, 2023; Goel et al., 2024; Mashamba & Chikutuma, 2023; Phan & Le, 2024). Authors such as Athanasoglou et al. (2006), Dietrich and Wanzenried (2011), and Eyalsalman et al. (2024) have identified factors influencing bank performance, including capitalization, productivity, and changes in macroeconomic regulations. Similarly, Demirguc-Kunt and Huizinga (1999) have emphasized the importance of market structure and macroeconomic factors in bank profitability.

The capital adequacy ratio (CAR), which has been explored in studies like those by Mathuva (2009), remains a crucial indicator of banks' financial soundness. This ratio measures the relationship between a bank's capital and its exposure to credit risk, ensuring the protection of depositors and promoting financial stability.

Furthermore, the COVID-19 pandemic introduced new challenges for commercial banks worldwide. Demirgüç-Kunt et al. (2021) highlight the pandemic's negative effect on bank profits, largely due to diminished loan repayment capacity. Similarly, Mendoza and Rivera (2017) found that credit risk significantly impacted bank performance in developing countries during crises.

However, existing literature has not sufficiently explored the specific impact of factors like investments, liquidity, solvency, and the debt-to-capital (DCR) and debt-to-asset ratios (DARs) on the financial performance of banks in Kosovo, particularly during crises like the COVID-19 pandemic. This gap in the literature forms the basis for the present study.

The aim of this study is to examine the influence of these factors on the financial performance of commercial banks in Kosovo during the period 2013–2021. Through regression analysis, this research offers fresh insights into the challenges and opportunities faced by commercial banks during the pandemic, thereby contributing to the existing literature on financial crisis management. The research questions guiding this study are as follows:

RQ1: What is the impact of investments, liquidity, and solvency on the financial performance of commercial banks?

RQ2: How do debt-to-capital and debt-to-asset ratios influence the stability and growth of banks during financial crises?

This study's relevance and significance lie in providing a comprehensive analysis that can aid policymakers and bank managers in Kosovo in enhancing resilience and improving risk management practices during challenging periods.

The main findings of this study are expected to help identify appropriate strategies to improve the financial management of banks in Kosovo, addressing the challenges of the pandemic period.

This study is structured as follows. Section 2 reviews the relevant literature. Section 3 analyses the methodology. Section 4 presents and interprets the results findings. Finally, in Section 5, we wrap things up with our conclusions and share some ideas for future research avenues.

2. LITERATURE REVIEW

The COVID-19 pandemic has fundamentally reshaped the world, disproportionately impacting social, economic, and cultural systems. Following the World Health Organization's (WHO) declaration of a global health emergency in late 2019, lockdown measures were swiftly implemented, forcing societies to adapt to an unprecedented new reality. This global crisis has evolved from a public health emergency into a severe economic crisis, hitting the global economy hard and causing one of the deepest recessions since the 1930s (Ali et al., 2020). The intervention of central banks in developing and transition economies (emerging market and developing economies, EMDE) to maintain financial stability during the COVID-19 pandemic was extremely necessary (Eckhold et al., 2024). The resulting crises triggered by the pandemic sent shockwaves through the global economy, characterized by sluggish growth rates, weakened trade and investment, historically high levels of debt, rising inequality, and widespread environmental degradation (United Nations Conference on Trade and Development [UNCTAD], 2020). According to the World Bank (2022), economic recovery has been uneven among countries, reflecting existing vulnerabilities and limited capacity to manage debt in some developing economies. For example, only 21% of low-income countries managed to surpass 2019 per capita income levels by 2021, compared to 40% of developed economies (World Bank, 2022, p. 2). This highlights the need for policies that ensure a fair and sustainable recovery, addressing inequalities and guaranteeing access to financial services. The study reveals that the COVID-19 pandemic significantly impacted banking performance in Indonesia, with notable differences in capital, earnings, efficiency, and liquidity before and during the pandemic, aligning with Harrod-Domar's growth theory, which links economic growth to savings and investments, emphasizing the pandemic's disruption of savings and bank capital (D'Orazio, 2023).

The ownership structures of European banks have significantly shifted since the global financial crisis due to takeovers, government guarantees, and bailouts (Corbet et al., 2022). Evidence suggests that government-supported banks demonstrate higher price discovery efficiency in non-crisis periods, with the COVID-19 pandemic serving as a case study for evaluating their resilience and corporate performance under idiosyncratic shocks (Corbet et al., 2022). In this context, the impact of the pandemic on macroeconomic indicators and the banking sector has been profound, highlighting the importance of analyzing factors such as the CAR, which serves as a shield against potential losses and stabilizes financial systems during economic crises (Bitar & Tarazi, 2022).

Many studies indicate that the COVID-19 pandemic has disrupted the economy through various macroeconomic challenges, including declines in aggregate demand, production, supply, trade flows, savings, investment, and employment, all of which could exacerbate poverty and potentially lead to a recession or depression (Barua et al., 2020). These challenges have disrupted economic activity, leading to income losses for businesses and households, which in turn may affect their ability to repay loans. As a result, banks may face financial losses, negatively impacting their profits and capital if repayment capacity continues to decline (Demirgüç-Kunt et al., 2021). High nonperforming loan ratios are particularly concerning as they negatively affect gross domestic product (GDP) per capita and pose medium-term risks to bank solvency and economic recovery (Bitar & Tarazi, 2022). The CAR plays a critical role in the context, as bank capital serves as a safeguard against potential losses. The findings highlight that banks need to adapt their liquidity and capital strategies to manage risks and maintain performance during crises like COVID-19, urging stakeholders to focus on capital adequacy, as it strengthens profitability and reduces vulnerabilities in uncertain environments (D'Orazio, 2023). Numerous academics and financial institutions have studied the factors that influence this ratio. Asarkaya and Ozca's (2007) study investigates the factors affecting the CAR in Turkish banks and finds that lagged capital, portfolio risk, economic growth, return on equity (ROE), and average capital

levels are positively related to CAR, while the deposit-to-asset ratio is negatively related. Mathuva's (2009) study analyzes the relationship between the CAR, income ratio, and profitability of Kenyan banks, demonstrating a negative relationship between the cost-income ratio and profitability. Dietrich and Wanzenried (2011) analyze the profitability of Swiss banks and find that capital, credit quality, deposit growth, and bank size significantly affect profitability. Williams (2011) analyzed the relationship between the capital base and macroeconomics as well as financial factors in Nigeria, identifying money supply as a key element of the CAR, while the real interest rate was found to be negatively related to it. Büyükşalvarci and Abdioğlu's (2011) analysis revealed that loans, leverage, and profitability had a significant influence on the CAR of Turkish banks, whereas size and liquidity exhibited no discernible effect. A positive relationship was found to the study by Yuanjuan and Shishun (2012) between return on assets (ROA) and CAR, while non-performing loans (NPLs) and loan-to-deposit ratio (LDR) were negatively impacted. Repkova (2012) emphasizes the importance of indices for large banks in the market. Almazari (2013) showed a positive relationship between CAR and profitability in Saudi banks, but a negative relationship between capital ratios and profitability. Bateni et al. (2014) found a negative relationship between bank size and CAR, but a positive relationship with ROA and the loan-to-asset ratio. An analysis of the factors influencing NPLs revealed strong correlations with macroeconomic variables such as public debt, unemployment, and GDP growth, as well as bank-specific indicators, including the CAR and return on invested capital (Makri et al., 2014). The study by Shingjergji and Hyseni (2015) demonstrates that NPLs and the LDR have a negative and significant impact on the CAR, while ROA and ROE show no relationship with CAR. In contrast, Pradhan and Shrestha (2017) found that the loan-to-total-deposit ratio has a positive effect on the financial performance of Nepalese commercial banks, whereas credit risk and the total capital ratio have a negative impact.

Mendoza and Rivera (2017) concluded that credit risk has a negative and statistically significant relationship with the profitability of rural banks in the Philippines, while capital adequacy does not have a significant impact on profitability. Similarly, the results of the study by Abbas et al. (2019) show that capital and liquidity positively affect profitability, while credit risk has a negative impact, with liquidity effects being more pronounced in small and medium-sized banks. Muigai and Muriithi (2017) and Muriithi and Waweru (2017) found that operational risk has a negative impact on the profitability of commercial banks in Kenya, with cost income being a key determinant.

Hassan (2019) demonstrated that deposit investments have a positive relationship with ROE, while the cost-to-income ratio (CIR), non-performing investments, and other variables show a negative relationship. Similarly, Ekinci and Poyraz (2019) found that credit risk has a negative relationship with financial performance indicators such as ROA and ROE.

According to various authors, banking competition is a crucial factor influencing market structure and financial stability. For instance, Cetorelli and Strahan (2006) argue that a lack of competition can harm the economy by limiting access to finance for small firms and start-ups, while Allen and Gale (2004) contend that increased competition may lead to riskier behavior by banks operating with minimal capital. In contrast, de Nicoló et al. (2006) suggest that more competitive systems can be more resilient to crises.

On the other hand, macroeconomic and internal factors of banks significantly influence profitability and banking performance. Studies by Athanasoglou et al. (2006) and Demirguc-Kunt and Huizinga (1999) demonstrate that factors such as bank capitalization, productivity, and changes in macroeconomic regulations have a strong impact on net interest margins and bank profitability. Additionally, research on bank profitability in developing countries highlights that factors like bank size, private ownership, and macroeconomic variables such as inflation and the business cycle play a crucial role (Flamini et al., 2009).

Overall, the literature suggests that the interplay between market structure, competition, and macroeconomic factors significantly influences financial stability and bank performance, posing a challenge for policymakers in balancing economic growth with financial stability.

The aim of this study is to conduct an analysis to test the following hypotheses:

H1: Investments have a significant impact on the return on assets of commercial banks in Kosovo during the COVID-19 pandemic.

H2: Liquidity has a significant impact on the return on assets of commercial banks in Kosovo during the COVID-19 pandemic.

H3: Solvency has a significant impact on the return on assets of commercial banks in Kosovo during the COVID-19 pandemic.

H4: The debt-to-asset ratio has a significant impact on the return on assets of commercial banks in Kosovo during the COVID-19 pandemic.

H5: The debt-to-equity ratio (DER) has a significant impact on the return on assets of commercial banks in Kosovo during the COVID-19 pandemic.

H6: The equity-to-asset ratio (EAR) has a significant impact on the return on assets of commercial banks in Kosovo during the COVID-19 pandemic.

The study analyzes seven commercial banks, with data sourced from their financial reports, available on each bank's official website.

3. METHODOLOGY

This study utilized secondary data from the financial statements of seven commercial banks operating in Kosovo. The research employed a Stata-based approach, and stratified and purposive sampling techniques were used to select the commercial banks for analysis.

The independent variables used in this study are *investments*, *liquidity*, *solvency*, *DAR*, *DER*, and *EAR*, while the dependent variable is *financial performance*, which is approximated by *ROA*. How the variables were measured is shown in Table 1 below.

Table 1. Variables and their measurement

Variables	Measurements
ROA	Net profit / total assets
Investments	Current year-base year / base year * 100
Liquidity	Current assets / current liabilities
Solvency	Net profit / total liabilities
DAR	Total liabilities / total assets
DER	Total liabilities / equity
EAR	Equity / total assets

$$ROA = \beta_0 + \beta_1(Investments) + \beta_2(Liquidity) + \beta_3(Solvency) + \beta_4(DAR) + \beta_5(DER) + \beta_6(EAR) + \varepsilon \qquad (1)$$

where,

- *ROA* is the dependent variable (return on assets);
- β_0 is the constant term;
- β_1 to β_6 are the coefficients for the respective independent variables;
- *Investments* is the independent variable representing the percentage change in investments;
- *Liquidity* represents the company's ability to meet its short-term obligations;
- *Solvency* reflects the company's ability to meet long-term obligations;
- *DAR* is the debt to assets ratio, indicating financial leverage;
- *DER* is the debt to equity ratio, showing the balance between debt and equity financing;
- *EAR* represents the proportion of equity in relation to total assets;
- ε is the error term.

While alternative methods like qualitative research or panel data analysis could offer additional insights, they would require a longitudinal focus that extends beyond the study's current scope and time constraints. The selected methodology strikes the right balance between depth, efficiency, and alignment with the research problem, ensuring the objectives are addressed comprehensively within the given limitations.

4. RESULTS AND DISCUSSION

4.1. Comparative analysis of linear trends for investments and return on assets

In continuation of this study, we will conduct a comparative analysis using linear trends and a historical method to evaluate *investments*, *liquidity*, *solvency*, *DAR*, *DER*, and *EAR*, as well as their relationship with *ROA*. This analysis will cover the period from 2013 to 2021, aiming to explain the impact of investments on enhancing ROA in seven commercial banks operating in Kosovo. Initially, it will analyze what effect liquidity and investments have on ROA.

Figure 1. Graphic presentation of the linear trend through the historical method
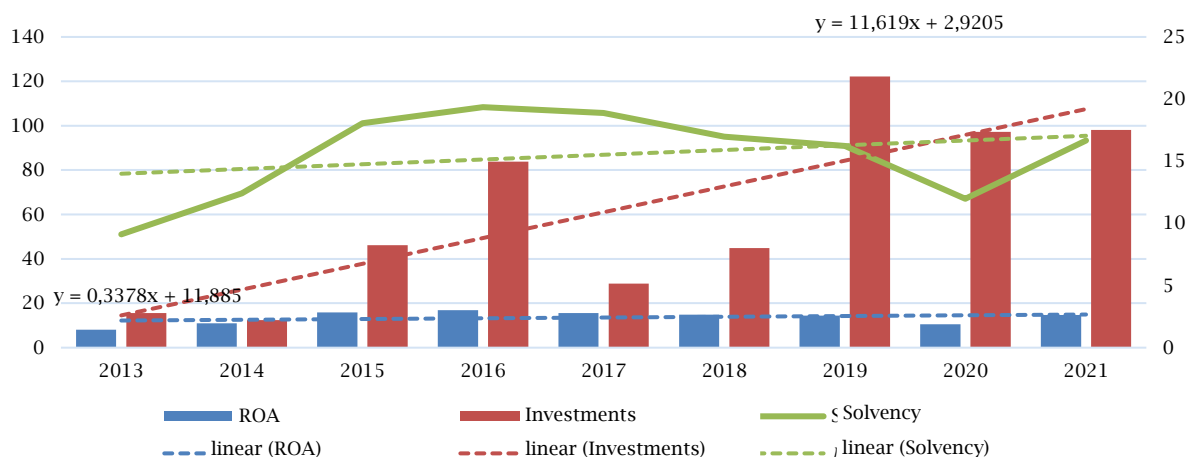(*ROA*, *investments*, and *liquidity*)
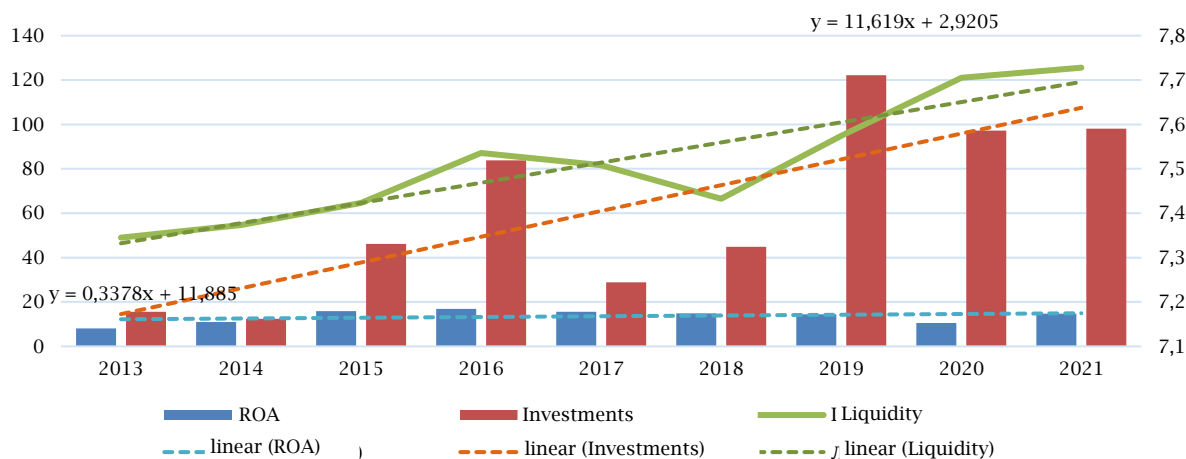
Source: Calculations by the Authors using the Microsoft Excel program.

Based on Figure 1, we can conclude that the fluctuation of *investments* and *liquidity* in the seven banks taken has affected the *ROA* results. In Figure 1, we have four cases that prove (scenarios): 1) investments have significantly decreased in 2014 while liquidity and ROA have increased compared to 2013, 2) investments have increased significantly in 2016 with the increase in investments, liquidity has increased, then ROA has also experienced an average increase, 3) investments and liquidity have increased but ROA remains almost constant (0), and 4) liquidity has increased and the increase in liquidity in the same year 2021 has enabled the increase of ROA and bank investments compared to 2020. From these results, we can see that these seven banks have performed real management during the pandemic period as investments and liquidity in 2021 have increased, as well as ROA.

Figure 2 shows the data on *ROA*, *investments*, and *solvency*. So, it will be analyzed what effect the *solvency* and the *investments* have on the *ROA*.

Figure 2. Graphical presentation of the linear trend through the historical method
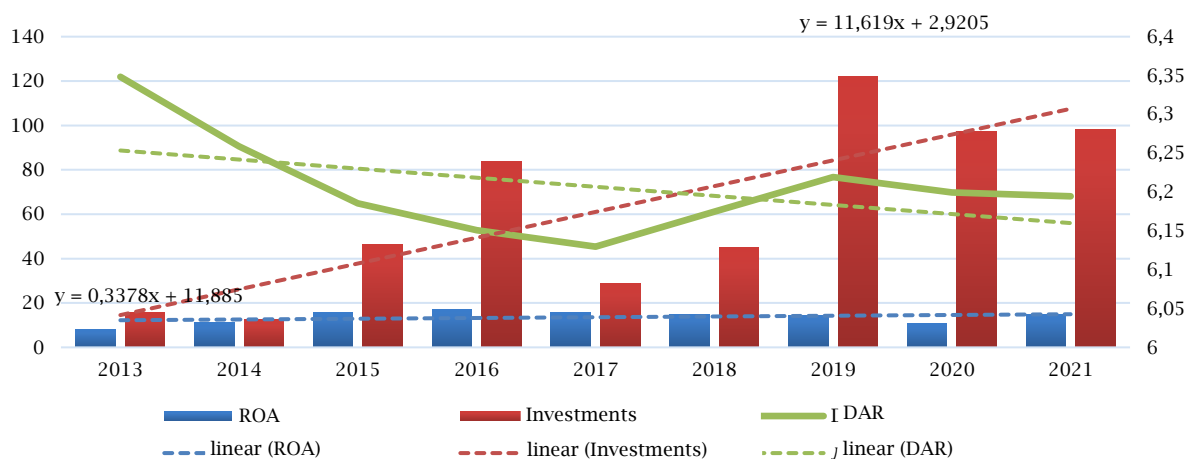(*ROA, investments*, and *solvency*)

Source: Calculations by the Authors using the Microsoft Excel program.

According to the statistical data presented graphically in the above Figure 2, it can be observed that during the analyzed period, the fluctuation of investments and solvency for the seven banks taken actually show that they have not affected the results in ROA. In Figure 2 above, we have three cases that prove (scenarios): 1) involves a significant decrease in investments while solvency increased; however, this increase in solvency did not lead to an improvement in the ROA of the banks; 2) investments rose while solvency declined, yet this

decrease in solvency did not adversely affect ROA; and 3) substantial increase in investments in 2019 that did not result in a corresponding increase in ROA. Similarly, the reduction in solvency cannot be said to have impacted the decline in ROA, just as it did not affect the increase in ROA in the first scenario.

Figure 3 graphically illustrates the data on *ROA, investments*, and *DAR*. This analysis will examine the effects of the *DAR* and *investments* on the *ROA* of the companies.

Figure 3. Graphic representation of the linear trend through the historical method
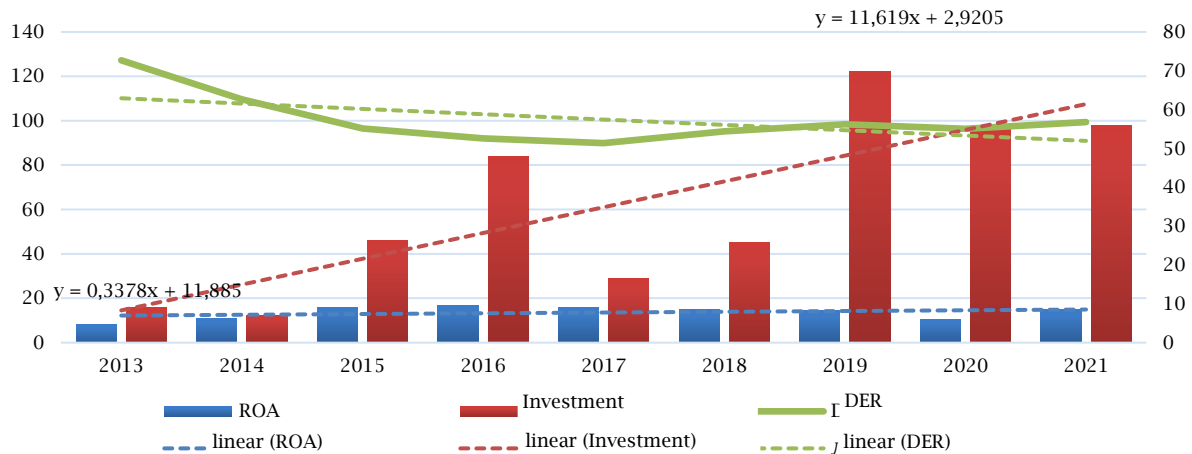(*ROA, investments*, and *DAR*)

Source: Calculations by the Authors using the Microsoft Excel program.

Based on the statistical data presented graphically in Figure 3 above, fluctuations in investments and the DAR during the analyzed period indicate their impact on ROA for the seven banks studied. In the first case, both investments and DAR experienced significant declines, but this reduction did not affect ROA. In the second case, investments increased significantly while DAR showed elevated values. The relationship between these variables indicates that the decline in DAR did not outweigh the growth in investments, leading to an increase in ROA for 2016. The third case reveals that despite a significant decrease in investments,

DAR exhibited substantial growth. Here, the decline in investments overshadowed the increase in DAR, resulting in no increase in ROA for 2018. Finally, in the fourth case, an increase in both investments and retained earnings positively influenced ROA for 2019. These cases collectively demonstrate the complex interplay between investments and the DAR in determining the financial performance of the banks.

Figure 4 shows the data on *ROA, investments*, and *DER*. So, it will analyze what effect *DER* and *investments* have on the *ROA* of companies.

Figure 4. Graphic representation of the linear trend through the historical method
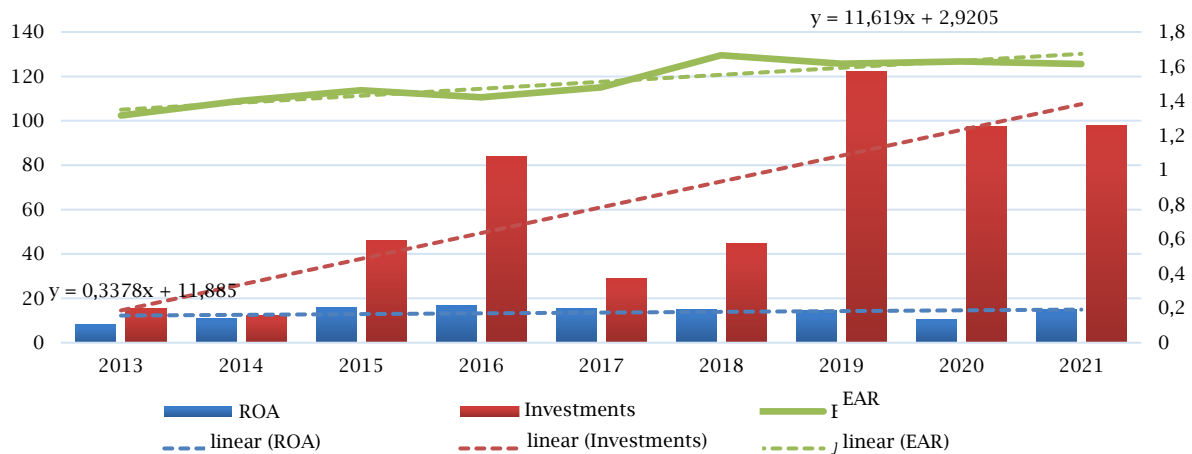(*ROA, investments,* and *DER*)

Source: Calculations by the Authors using the Microsoft Excel program.

According to the statistical data presented graphically in Figure 4 above, fluctuations in investments and the DER during the analyzed period indicate their impact on ROA for the seven banks studied. Three notable cases illustrate this relationship. In the first case, a slight reduction in investments along with relatively stable DER in 2014 resulted in a corresponding decrease in ROA. The second case reveals that while investments significantly decreased, the DER experienced substantial growth. This relationship suggests that the decline in investments did not outweigh the DER, leading to an increase in ROA for 2017. Finally, the third case demonstrates that the increase in both investments and DER in 2019 contributed to the significant rise in ROA for that year.

Figure 5 will analyze what effect *EAR* and *investments* have on the *ROA* of companies.

Figure 5. Graphical presentation of the linear trend through the historical method
(*ROA, investments,* and *EAR*)

Source: Calculations by the Authors using the Microsoft Excel program.

Based on the statistical data illustrated in Figure 5 above, fluctuations in investments and the EAR during the analyzed period demonstrate their impact on ROA for the seven banks studied. Three significant cases highlight this relationship. In the first case, a decrease in investments coincided with an increase in EAR compared to 2013, resulting in an increase in ROA. The second case indicates that both investments and EAR experienced growth, which contributed to the increase in ROA for 2016. In the third case, although investments rose, the EAR declined relative to the previous year, leading to the conclusion that ROA did not increase when compared to the prior year. Collectively, these cases illustrate the complex interplay between investments, EAR, and their influence on the financial performance of the banks.

4.2. Econometric analysis and study findings

In this section of the econometric analysis, we will present the results of descriptive statistics, the Pearson correlation coefficient, and hypothesis testing through various statistical tests for the variables included in the econometric models. The descriptive statistics will encompass the minimum and maximum values, mean, and standard deviation. Additionally, we will provide a graphical representation of the normal distribution of the data to assess the measurability of the variables

incorporated in the econometric models. All this will help us to understand the overall picture. This section aims to validate the presented hypotheses and interpret the findings of the study comprehensively. Finally, regression analysis helps pinpoint how much each factor affects profitability (measured by ROA). Together, these approaches don't just crunch the numbers — they tell a story about the financial health and decision-making in these banks.

Table 2 summarizes all the descriptive statistics for all the variables included in the econometric models of this study.

Table 2. Descriptive statistics for variables included in econometric models

Variables	Obs.	Minimum	Maximum	Mean	Std. deviation
ROA	63	1.939249	0.7223642	0.019386	4.270888
Investments	63	8.716529	18.41329	-90.33444	81.33309
Liquidity	63	15,688.69	124,516.6	0.869221	988,321
Solvency	63	2.217136	0.8642645	0.020886	5.121937
DAR	63	0.8866716	0.0236517	0.8198862	0.944044
DER	63	8.205646	1.883358	4.552046	13.14503
EAR	63	0.215946	0.2685267	0.070723	0.9836522

Source: Authors' calculations using Stata.

The descriptive statistics in Table 2 reveal that the average ROA is 0.019%, accompanied by a standard deviation of 4.27 units. This tells us there's a lot of variation across the banks. The mean of investments shows a significant deviation, with a standard deviation of 81.33 units from a negative mean of 90.33% suggests that many banks are pulling back on investments — possibly due to challenges in the sector. The average liquidity is recorded at 0.87%, with a standard deviation of 988 units, which shows that banks are taking quite different approaches to managing their cash flows. Additionally, the average solvency is 0.021%, with a corresponding standard deviation of 5.12 units. The mean of DAR is 0.819%, accompanied by a standard deviation of 0.944 units. The average of DER stands at 4.55%, with a standard deviation of 13.15 units. Finally, the average of EAR is 0.071%, with a standard deviation of 0.984 units. These indicators provide a comprehensive overview of the financial performance metrics of the banks under study.

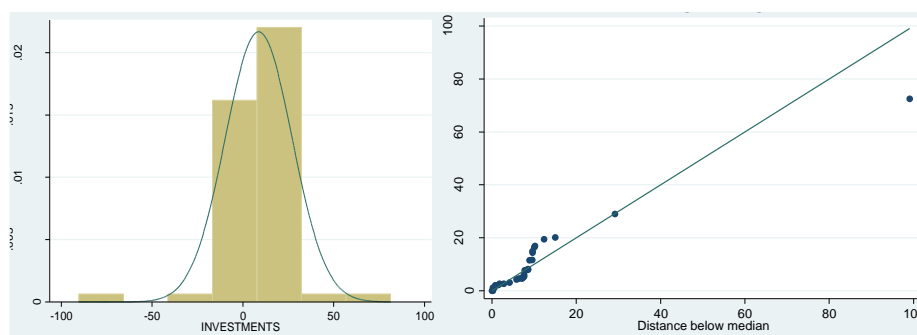**Figure 6.** Statistical distribution and normality of ROA data
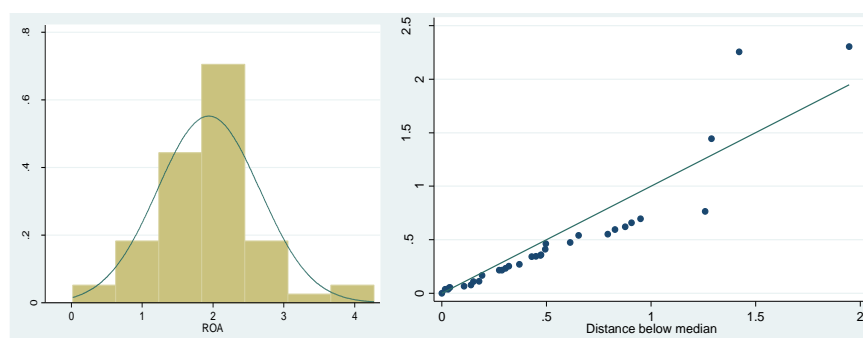
Source: Authors' calculations using Stata.

From Figure 6 above, it can be seen that the *ROA* data is statistically measurable and has a normal distribution. Since the shape of the histogram is quartile. Also, it can be seen that the points are very close to the linear regression line, with a very small deviation, so the distribution of data on ROA is very small.

Figure 7. Statistical distribution and normality of investment data
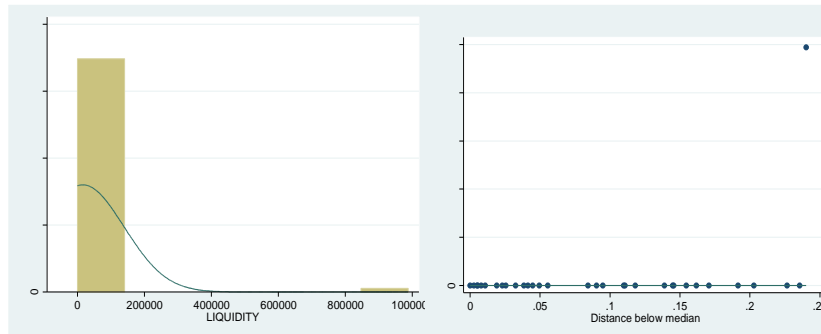

Source: Authors' calculations using Stata.

From Figure 7 above, it can be seen that the *investments* data are statistically measurable and have a normal distribution since the shape of the histogram is quartile. Also, the points are very close to the linear regression line, with a very small deviation, so the distribution of data on investments is extremely small.

Figure 8. Liquidity data distribution and deviation from linear regression
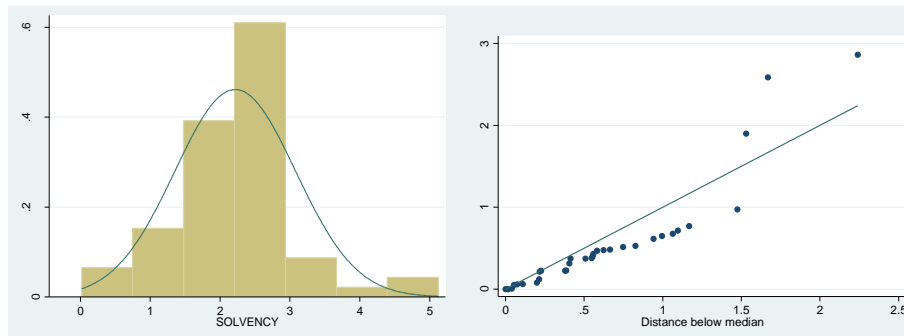

Source: Authors' calculations using Stata.

Figure 8 presented above, indicates that the *liquidity* data exhibits limited statistical measurability, approximating a normal distribution. However, the histogram's shape does not fully conform to a quartile distribution. To achieve a proper normal distribution, it may be necessary to adjust the investment data derived from the service companies or those under study. From Figure 8 above, it can be seen that the points are very close to the straight line at the beginning of the linear regression, but at the end the points deviate from the linear regression line, so we can say that there is an average deviation, so the distribution of data on liquidity is average.

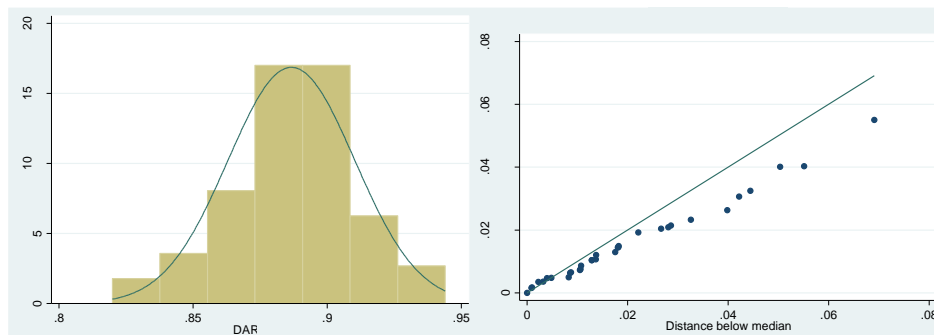**Figure 9.** Statistical distribution and normality of solvency data

Source: Authors' calculations using Stata.

From Figure 9 above, it can be seen that the *solvency* data are statistically measurable and have a normal distribution since the form of the histogram is quartile. The points are very close to the linear regression line, with a very small deviation, so the distribution of data on solvency is very small.
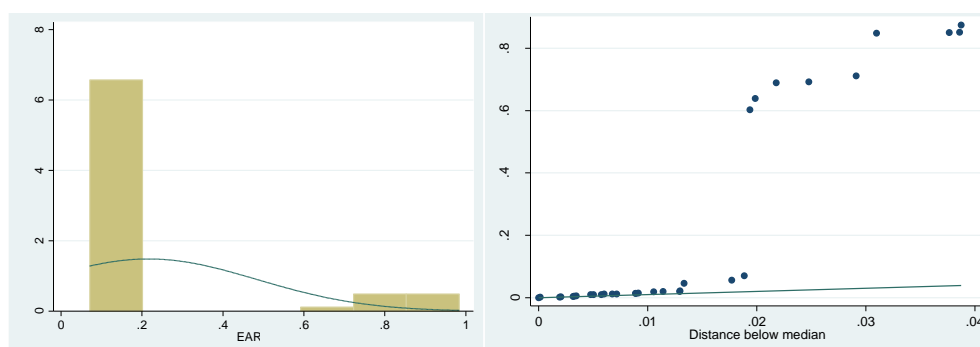
Figure 10. Statistical distribution and normality of debt-to-assets ratio data

Source: Authors' calculations using Stata.

Figure 10 above illustrates that the ratio of liabilities to capital data is approximately statistically measurable, suggesting that it closely resembles a normal distribution. The histogram's shape aligns with a quartile distribution, indicating a degree of normality. However, to achieve a fully normal distribution, only a minor intervention in the solvency data derived from the service companies or those included in the study is required. Figure 10 above demonstrates that the data points closely align with the linear regression line, exhibiting minimal deviation. This indicates that the distribution of data regarding DAR is tightly clustered.

Figure 11. Statistical distribution and normality of equity-to-assets ratio data

Source: Authors' calculations using Stata.

Figure 11 above indicates that the data concerning *EAR* exhibits limited statistical measurability and approximates a normal distribution. However, the histogram's shape does not fully conform to a quartile distribution. To achieve a complete normal distribution, it is essential to adjust the capital data derived from the banks or included in the study. From Figure 11 above, it can be seen that the points are very close to the linear regression line, with a very small deviation, so the distribution of data on EAR is very small.

Table 3. Pearson correlation analysis for variables included in econometric models

	ROA	*Investments*	*Liquidity*	*Solvency*	*DAR*	*DER*	*EAR*
ROA	1.0000						
Investments	0.0212	1.0000					
Liquidity	-0.0462	0.0809	1.0000				
Solvency	0.9897	0.0879	-0.0508	1.0000			
DAR	-0.6614	-0.0477	0.0481	-0.6880	1.0000		
DER	-0.6697	-0.0433	0.0251	-0.6877	0.9549	1.0000	
EAR	0.0952	-0.0215	-0.0532	0.1126	-0.4950	-0.4741	1.0000

Table 3 above presents the correlation coefficients among the variables, illustrating the extent to which the growth of the independent variables — namely, *investments*, *liquidity*, *solvency*, *DAR*, *DER*, and *EAR* — affects the dependent variable, *ROA*. Notably, the correlation between ROA and investments indicates a weak positive relationship; specifically, an increase in investments corresponds to an increase in ROA by 0.212.

The correlation between ROA and liquidity reveals a very weak negative relationship. Specifically, as liquidity increases, ROA decreases by 0.0462. Conversely, the correlation between ROA and solvency indicates a weak positive relationship, suggesting that an increase in solvency corresponds to an increase in ROA by 0.9897.

The correlation between ROA and DAR demonstrates a very weak negative relationship, indicating that an increase in DAR corresponds to a decrease in ROA by 0.6614. Similarly, the correlation between ROA and DER is characterized as a very weak negative correlation, suggesting that as DER increases, ROA decreases by 0.6697. In contrast, the correlation between ROA and EAR reveals a weak positive relationship, wherein an increase in EAR is associated with a rise in ROA by 0.0952.

Table 4. Regression analysis

Variables	*Coefficients*	*t-statistics*	*p-value*
Investments	-0.0026346	-4.1	0.000
Liquidity	0.0000000436	0.46	0.648
Solvency	0.8493502	41.7	0.000
DAR	3.1427530	1.81	0.076
DER	-0.0285036	-1.34	0.186
EAR	-0.0121012	-0.22	0.824
Constant	-2.4716820	-1.76	0.084
R-square	0.9853000		

R-square or otherwise the coefficient of determination is used as a measure of "goodness of fit" and compares the validity of the regression equation. In other words, the coefficient of determination shows how much the dependent variable is explained by the independent variables. R-square is sensitive to the number of independent variables included in a regression equation.

The inclusion of additional independent variables mathematically results in a higher coefficient of determination. In this case, the coefficient of determination has the value 98.53%, which means that the dependent variable (*ROA*) depends on the independent variables (*investments*, *liquidity*, *solvency*, *DAR*, *DER*, and *EAR*) for 98.53%.

Table 4 shows regression coefficients for the independent variables with the dependent variable. The negative coefficient indicates that, all else being equal, an increase in investments is associated with a decrease in ROA. For each unit increase in investments, ROA decreases by approximately 0.00263 units. Since the p-value is 0.000 (less than 0.05), this relationship is statistically significant, meaning that the impact of investments on ROA is reliable and not due to random chance. This might mean that investments aren't paying off immediately, perhaps due to inefficiencies or the long-term nature of the returns. The positive coefficient suggests that an increase in

liquidity has a positive relationship with ROA, but the effect is very small (almost negligible). However, the p-value of 0.648 is much greater than 0.05, indicating that this relationship is not statistically significant. This means that liquidity does not have a reliable impact on ROA based on this regression analysis. When we look at the regression results in Table 4, one thing is crystal clear that solvency plays a major role in profitability. The positive coefficient shows that higher solvency is associated with a higher ROA. Specifically, for each unit increase in solvency, ROA increases by 0.84935 units. The p-value is 0.000, indicating that this result is statistically significant. This suggests that solvency has a strong positive impact on the financial performance of the bank as measured by ROA. It's clear that keeping finances stable is critical for a bank's success. The positive coefficient suggests that an increase in the DAR is associated with an increase in ROA. However, the p-value of 0.076 is greater than the standard threshold of 0.05, indicating that the result is not statistically significant at the 5% level. Still, it is close to being significant, so it might be considered significant at a 10% level (p < 0.10), suggesting a potential positive relationship but with less certainty. The negative coefficient indicates that an increase in the DER tends to decrease ROA. However, the p-value of 0.186 is higher than 0.05, making this relationship statistically insignificant. This means that the data does not provide strong evidence that the DER significantly affects ROA. The negative coefficient suggests that an increase in the EAR is associated with a slight decrease in ROA. However, the p-value of 0.824 indicates that this relationship is not statistically significant. Thus, changes in the EAR do not have a meaningful impact on ROA in this model. The constant term represents the expected value of ROA when all the independent variables are zero. The p-value of 0.084 suggests that the constant term is not statistically significant at the 5% level but could be considered significant at a 10% level (p < 0.10).

Based on the results of the study, *H1* is partially supported, as investments are associated with a decrease in ROA. Conversely, *H2* is not supported, as liquidity has no significant impact on ROA. However, *H3* is supported, with solvency positively affecting ROA. Hypothesis *H4* presents borderline significance, suggesting a potential impact. Hypothesis *H5* is not supported due to the insignificance of the DER, while *H6* shows no meaningful impact from the EAR. What this tells us is that the financial world isn't simple — it's a complex mix of factors, many of which depend on the specific context of the banking sector or even the broader economy. These findings remind us that understanding financial performance requires looking beyond the numbers to the bigger picture.

5. CONCLUSION

The COVID-19 pandemic has tested global financial systems, including commercial banks in Kosovo. As observed in this study, despite the challenges presented by the pandemic, commercial banks in Kosovo have managed to maintain and improve their financial performance during the period 2013–2021. Factors such as investments, liquidity, solvency, and DER and DAR have played an important role in stabilizing and increasing ROA during this period.

This study sheds light on the intricate dynamics between key financial metrics and the performance of commercial banks in Kosovo during the COVID-19 pandemic. The results reveal that solvency plays a crucial role in sustaining positive bank performance, with a significant positive relationship to ROA, suggesting that a focus on maintaining solvency is essential for banks in times of economic distress. This underscores the importance of prioritizing solvency strategies to enhance financial stability. The findings also indicate that investments, while negatively associated with ROA, can impact performance under certain conditions, though their effect is more complex and context-dependent, suggesting that further exploration of investment efficiency is necessary. The DAR showed potential positive effects, albeit with a lower level of statistical significance. Liquidity, on the other hand, did not demonstrate a strong impact on ROA during the pandemic, suggesting that other factors may take precedence in influencing bank performance during crises.

This research offers important insights into how key financial metrics influence the performance of banks during times of crisis, shedding light on a topic that hasn't been widely explored — Kosovo's banking sector's ability to remain resilient. It emphasizes the need to consider both microeconomic factors, like how banks manage their internal strategies, and macroeconomic factors, such as the impact of regulations and market conditions, in future studies. To build on these findings, future research could take a closer look at how external shocks — such as health crises or geopolitical uncertainty — affect the way banks implement financial policies. Additionally, comparing Kosovo's banking system to others in the region could provide a richer, more comprehensive understanding of how different strategies contribute to resilience in challenging times.

For practitioners, this study highlights the importance of finding a balance when managing solvency, liquidity, and investments. It also stresses the need to think strategically about diversifying investments, improving liquidity management, and upgrading technology to boost efficiency. Collaboration between banks and policymakers is key to creating frameworks that support economic stability and long-term growth. Working together, they can build a stronger, more resilient financial system for the future.

While the study provides a robust analysis of key financial indicators, it is not without limitations. The dataset covers the period 2013–2021, which, while comprehensive, may not fully capture long-term trends beyond the immediate aftermath of the pandemic. Finally, the study primarily uses financial ratios, leaving room for future research to explore qualitative factors such as organizational culture, leadership practices, and customer behavior during crises.

In conclusion, the study shows that commercial banks in Kosovo have managed to face the challenges of the COVID-19 pandemic successfully and navigated the challenges of the COVID-19 pandemic by adopting effective financial strategies. It is essential for these banks to remain proactive in managing critical financial metrics and to continue innovating in response to emerging challenges. By combining strategic diversification, improved technological investments, and close collaboration with policymakers, Kosovo's banking sector can enhance its resilience and sustainability in the face of future crises.

REFERENCES

Abbas, F., Iqbal, S., & Aziz, B. (2019). The impact of bank capital, bank liquidity and credit risk on profitability in postcrisis period: A comparative study of US and Asia. *Cogent Economics & Finance, 7*(1), Article 1605683. https://doi.org/10.1080/23322039.2019.1605683

Ali, M., Alam, N., & Rizvi, S. A. R. (2020). Coronavirus (COVID-19) — An epidemic or pandemic for financial markets. *Journal of Behavioral and Experimental Finance, 27*, Article 100341. https://doi.org/10.1016/j.jbef.2020.100341

Allen, F., & Gale, D. (2004). Competition and financial stability. *Journal of Money, Credit, and Banking, 36*(3), 453–480. https://doi.org/10.1353/mcb.2004.0038

Almazari, A. A. (2013). Capital adequacy, cost income ratio and the performance of Saudi banks (2007–2011). *International Journal of Academic Research in Accounting, Finance and Management Sciences, 3*(4), 284–293. https://www.academia.edu/78877202/Capital_Adequacy_Cost_Income_Ratio_and_the_Performance_of_Saudi_Banks

Asarkaya, Y., & Ozcan, S. (2007). Determinants of capital structure in financial institutions: The case of Turkey. *BDDK Bankacılık ve Finansal Piyasalar Dergisi, 1*, 91–109. https://dergipark.org.tr/en/download/article-file/1352531

Athanasoglou, P. P., Delis, M., & Staikouras, C. (2006). *Determinants of bank profitability in the South Eastern European region* (Working Paper No. 47). Bank of Greece. https://doi.org/10.2139/ssrn.4163741

Barua, Z., Barua, S., Aktar, S., Kabir, N., & Li, M. (2020). Effects of misinformation on COVID-19 individual responses and recommendations for resilience of disastrous consequences of misinformation. *Progress in Disaster Science, 8*, Article 100119. https://doi.org/10.1016/j.pdisas.2020.100119

Bateni, L., Vakilifard, H., & Asghari, F. (2014). The influential factors on capital adequacy ratio in Iranian banks. *International Journal of Economics and Finance, 6*(11), 108–116. https://doi.org/10.5539/ijef.v6n11p108

Bitar, M., & Tarazi, A. (2022). A note on regulatory responses to COVID-19 pandemic: Balancing banks' solvency and contribution to recovery. *Journal of Financial Stability, 60*, Article 101009. https://doi.org/10.1016/j.jfs.2022.101009

Büyükşalvarci, A., & Abdioğlu, H. (2011). Determinants of capital adequacy ratio in Turkish banks: A panel data analysis. *African Journal of Business Management, 5*(27), Article 7381FCD17845. https://doi.org/10.5897/AJBM11.1957

Capuano, P. (2022). Impact of directors' remuneration on banks' performance: Evidence in the US banking system. *Corporate Board: Role, Duties and Composition, 18*(3), 24–32. https://doi.org/10.22495/cbv18i3art3

Cetorelli, N., & Strahan, P. E. (2006). Finance as a barrier to entry: Bank competition and industry structure in local U.S. markets. *The Journal of Finance, 61*(1), 437–461. https://doi.org/10.1111/j.1540-6261.2006.00841.x

Corbet, S., Cumming, D. J., Hou, Y., Hu, Y., & Oxley, L. (2022). Have crisis-induced banking supports influenced European bank performance, resilience and price discovery? *Journal of International Financial Markets, Institutions and Money, 78*, Article 101566. https://doi.org/10.1016/j.intfin.2022.101566

Demirguc-Kunt, A., & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: Some international evidence. *The World Bank Economic Review, 13*(2), 379–408. https://doi.org/10.1093/wber/13.2.379

Demirgüç-Kunt, A., Pedraza, A., & Ruiz-Ortega, C. (2021). Banking sector performance during the COVID-19 crisis. *Journal of Banking & Finance, 133*, Article 106305. https://doi.org/10.1016/j.jbankfin.2021.106305

de Nicoló, G., Jalal, A. M., & Boyd, J. H. (2006). *Bank risk-taking and competition revisited: New theory and new evidence* (IMF Working Paper No. 2006/297). International Monetary Fund (IMF). https://doi.org/10.5089/9781451865578.001

Dietrich, A., & Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland. *Journal of International Financial Markets, Institutions and Money, 21*(3), 307–327. https://doi.org/10.1016/j.intfin.2010.11.002

D'Orazio, P. (2023). Navigating financial stability through the dual challenges of climate change and pandemics. *Current Opinion in Environmental Sustainability, 65*, Article 101386. https://doi.org/10.1016/j.cosust.2023.101386

Eckhold, K., Faltermeier, J., King, D., Mak, I., & Petrov, D. (2024). *EMDE Central Bank interventions during COVID-19 to support market functioning* (IMF Working Paper No. 2024/101). International Monetary Fund (IMF). https://doi.org/10.5089/9798400275845.001

Ekinci, R., & Poyraz, G. (2019). The effect of credit risk on financial performance of deposit banks in Turkey. *Procedia Computer Science, 158*, 979–987. https://doi.org/10.1016/j.procs.2019.09.139

Eyalsalman, S., Alzubi, K., & Marashdeh, Z. (2024). The impact of IFRS 9, liquidity risk, credit risk, and capital on banks' performance [Special issue]. *Journal of Governance & Regulation, 13*(1), 396–404. https://doi.org/10.22495/jgrv13i1siart13

Flamini, V., Schumacher, L B., & McDonald, C. A. (2009). *The determinants of commercial bank profitability in sub-Saharan Africa* (IMF Working Paper No. 2009/015). International Monetary Fund (IMF). https://doi.org/10.5089/9781451871623.001

Muigai, R. G., & Muriithi, J. G. (2017). The moderating effect of firm size on the relationship between capital structure and financial distress of non-financial companies listed in Kenya. *Journal of Finance and Accounting, 5*(4), 151–158. https://doi.org/10.11648/j.jfa.20170504.15

Goel, A., Sahay, N., & Tyagi, A. (2024). Bank performance evaluation of sustainability strategy dimensions in the emerging market using the MCDM approach. *Corporate & Business Strategy Review, 5*(3), 106–116. https://doi.org/10.22495/cbsrv5i3art10

Hassan, S. M. R. (2019). Impact of internal factors on banks' ROE. In *Proceedings of the International Conference on Business and Management* (pp. 534–537). https://www.researchgate.net/publication/334443096_Impact_of_Internal_Factors_on_Banks%27_ROE

Makri, V., Tsagkanos, A., & Bellas, A. (2014). Determinants of non-performing loans: The case of Eurozone. *Panoeconomicus, 61*(2), 193–206. https://doi.org/10.2298/PAN1402193M

Mashamba, T., & Chikutuma, C. N. (2023). Determinants of bank profitability: Evidence from the emerging economy [Special issue]. *Corporate & Business Strategy Review, 4*(4), 310–323. https://doi.org/10.22495/cbsrv4i4siart12

Mathuva, D. M. (2009). Capital adequacy, cost income ratio and the performance of commercial banks: The Kenyan scenario. *The International Journal of Applied Economics and Finance, 3*(2), 35–47. https://doi.org/10.3923/ijaef.2009.35.47

Mendoza, R., & Rivera, J. P. R. (2017). The effect of credit risk and capital adequacy on the profitability of rural banks in the Philippines. *Scientific Annals of Economics and Business, 64*(1), 83–96. https://www.ceeol.com/search/article-detail?id=546047

Muriithi, J. G., & Waweru, K. M. (2017). Liquidity risk and financial performance of commercial banks in Kenya. *International Journal of Economics and Finance, 9*(3), 256–265. https://doi.org/10.5539/ijef.v9n3p256

Phan, A., & Le, T. H. T. (2024). Intellectual capital and bank performance: A board of directors' agenda. *Corporate Board: Role, Duties and Composition, 20*(3), 128–138. https://doi.org/10.22495/cbv20i3art12

Pradhan, R. S., & Shrestha, A. K. (2017). *The impact of capital adequacy and bank operating efficiency on financial performance of Nepalese commercial banks.* https://doi.org/10.2139/ssrn.3044068

Repkova, I. (2012). Market power in the Czech banking sector. *Journal of Competitiveness, 4*(1), 143–155. https://doi.org/10.7441/joc.2012.01.11

Shingjergji, A., & Hyseni, M. (2015). The determinants of the capital adequacy ratio in the Albanian banking system during 2007–2014. *International Journal of Economics, Commerce and Management, 3*(1). https://ijecm.co.uk/wp-content/uploads/2015/01/3121.pdf

World Bank. (2022). *World development report 2022: Finance for an equitable recovery.* https://doi.org/10.1596/978-1-4648-1730-4

United Nations Conference on Trade and Development (UNCTAD). (2020). *Road to recovery.* https://unctad.org/system/files/official-document/dom2021flyer_en.pdf

Williams, H. T. (2011). Determinants of capital adequacy in the banking sub-sector of the Nigeria economy: Efficacy of Camels (A model specification with co-integration analysis). *International Journal of Academic Research in Business and Social Sciences, 1*(3), 233–248. https://hrmars.com/papers_submitted/8642/determinants-of-capital-adequacy-in-the-banking-sub-sector-of-the-nigeria-economy-efficacy-of-camels-a-model-specification-with-co-integration-analysis.pdf

Yuanjuan, L., & Shishun, X. (2012). Effectiveness of China's commercial banks' capital adequacy ratio regulation a case study of the listed banks. *Interdisciplinary Journal of Contemporary Research in Business, 4*(1), 58–68. https://www.proquest.com/docview/1029925266/13ADE8ADE773CDC1B1?