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The effects of banking regulations on banking performance in selected emerging countries

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Abstract

In terms of both developed and developing countries, banking regulations have a very important place for regulatory authorities and investors. The study aims to examine the effects of regulations on banking performance and profitability. The effects of regulatory indicators such as capital adequacy, liquidity, and total provisions on the return on assets of banks are examined. In this study, Annual data set of 53 banks operating in selected Balkan countries and Turkey was constructed for the study, and analysis estimation using the System Generalized Moments Method (SGMM) were carried out. In addition, GDP, Inflation, Total Assets, and Budget deficits are used as control variables. According to the findings obtained from the study, it has been ascertained that the primary determinant impacting the return on assets is capital adequacy as per the regulatory criterion. Apart from this, it has been concluded that liquidity, which is one of the other regulatory indicators, has a positive and a negative effect on its counterparts in terms of its effects on return on assets. According to the research analysis applied in the study, it has been concluded that the regulatory indicators increase the profitability of capital adequacy and liquidity.

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1. Introduction

The banking sector needs constant updating and regulation due to its unique features. The need for regulation intensifies during crisis periods and contributes to the reduction of risks in the financial system. In addition, the sanctions and inspections applied to the banks in this sector may affect their profitability and performance.

The impact of regulations implemented by different states and countries varies, leading banks in jurisdictions with stricter sanctions to relocate their operations to jurisdictions with more lenient regulations. In other words, the differences in banking regulations between countries cause regulatory arbitrage. Because of this, the regulatory authorities and rule makers should determine the scope, duration, and content of the regulations as well as how these regulations will affect the banks. The Basel Standards, established by the Basel Committee with the purpose of regulating and supervising banks operating in international markets, have been widely accepted and implemented in numerous countries owing to the variations in banking practises across

jurisdictions. In this case, as stated in the studies discussed in the literature, it is seen that regulations generally have a positive effect on the performance of banks.

The main purpose of this study is to examine the effects of banking regulations on banking performance within the scope of the Basel criteria. In this context, an examination was conducted on the annual data of 67 banks that operate on the stock exchanges of Turkey, Croatia, Serbia, and Bosnia and Herzegovina. These countries share historical and geographical relations with each other, allowing for accessible data. The analysis focused on the financial data of 59 banks, covering the period from 2010 to 2019.

In the literature reviews, it is observed that research on this subject is typically conducted either through comparative analysis of multiple countries or by examining a sample from a single country. It is observed that research on this topic is typically conducted either through a comparative analysis of multiple countries or by examining a sample from a single country. It is not possible to compare the results as the group of countries implements their regulatory decisions together and their development levels are similar. The countries sampled in the study, namely Turkey, Croatia, Bosnia and Herzegovina, and Serbia, have different development levels, financial infrastructures, and banking sector backgrounds. Apart from these differences, the banking sector backgrounds are similar to each other. These countries started to regulate their financial systems, especially after 1980. In addition, the sample countries in the study are countries that are not included in the same group. As can be seen in the similar literature, research pertaining to this particular subject typically focuses on singular dimensions of performance such as stability, profitability, and risk. However, our study allows for a multidimensional analysis that encompasses both performance and risk.

1.1. Banking System in Sample Countries

The decisions taken on January 24, 1980, have a very important place in terms of the development of financial institutions in Turkey. During this period, interest rates were released in Turkey, allowing them to be determined in the market. In addition, allowing the establishment of new domestic and foreign banks ensured a competitive environment. The need for the establishment of the Banking Regulation and Supervision Agency (BRSA) was aroused due to the necessity of regulating and supervising the banking system in the country.

Another nation included in the analysis is Bosnia and Herzegovina, where commercial banks predominate in the financial sector. There are 24 banks operating. Since Bosnia and Herzegovina consists of two entities (Federation of Bosnia and Herzegovina and Republika Srpska), the Banking Department of Bosnia and Herzegovina and the Banking Department of Republika Srpska, each of which is a banking institution, serve as the two supervisory bodies for the banking industry (EBF-Bosnia & Herzegovina, 2020). After the 1990s, new modern banking laws were enacted, and the authority to regulate, supervise, and monitor the banking sector and an institutional-based guide were given to the Federation of Bosnia and Herzegovina Banking Agency (FBHBA).

Serbia, another sample country, has an independent structure for the implementation of its banking, national bank, and other laws and is only responsible to the National Assembly of the Republic of Serbia for its operations. The main objective of the central bank is to ensure and sustain price stability. It contributes to maintaining and strengthening the financial system's stability without going beyond this purpose (NBS, 2021).

The Croatian banking sector has undergone significant changes over the past two decades, becoming a more impulsive and competitive sector with significant contributions to social stability and economic development. The problems of the socialist legacy have mostly been resolved, privatization has taken place, and a system in which most of the bank's assets belong to foreigners has been established (Galac & Kraft, 2001; Pojatina, 2000). The Croatian National Bank has established the regulatory framework for information system supervision in the Republic of Croatia. Mandatory regulations have the purpose of effectively managing operational risk levels in credit institutions such as banks, insurance companies, etc.

1.2. Financial Regulation and Banking Regulations

Financial regulation is the setting of operating rules, the imposition of controls, and the imposition of restrictions on the sector, which are addressed as part of the economic structure. In light of this information, financial regulation can be defined as the restrictions and rules imposed by the regulatory authority on the behavior and decisions of financial agents to maximize their social function (Yay, Yay, & Ensar, 2001).

The impact of regulations on the banking sector may vary because of a variety of bank-specific, sectorial, or macro factors. Because of this, laws don't always have the same impact across nations or banks. Due to the fact that international banking regulations vary, banks are inclined to move their operations to nations with laxer restrictions. Because of this, the banking industry does not grow equitably on a global scale and brings about problems that affect the entire world. The Basel Banking Supervision Committee was established under the aegis of the Bank for International Settlements (BIS) to guarantee central bank coordination and carry out a uniform strategy for banking regulations. Since its establishment, the committee has grown into a significant advisory and decision-making body for banking regulations that can be implemented globally (Gadou, 2022; Tiryaki & Yılmaz, 2012).

Based on the concepts of regulatory capital and risk-weighted assets, Basel-I is a capital adequacy strategy. The capital adequacy ratio, which illustrates the health of the financial institution, has been identified as the most crucial measure in Basel-I. This ratio stipulates that the ratio of bank capital to risk-weighted assets must

be at least 8%. In order to improve the protection of bank capital, which is one of the Basel goals to eliminate the criticized elements and flaws and lower systemic risk, new regulatory standards were required. In response to identified deficiencies in the Basel framework, the Basel Committee on Banking Supervision formulated a proposition for an amended legislation on capital adequacy in June 1999. Based on this suggestion, the committee finished its Basel II draft studies in June 2004 and put them into operation in 2006.

Basel-Primary II's goal is to improve the banking industry's capacity to handle issues brought on by the global financial crisis (2007–2009) and other similar economic issues. As stated by Kozarevic and Polić (2016), Basel-II also aims to improve risk management, which operationally reinforces the transparency and disclosure of banks and enhances the quality of capital components, liquidity criteria, and leverage ratio. As a result of the global crisis that emerged in 2008, it was understood that Basel II regulations were insufficient and a new regulation was needed. The development of the Basel III consensus, pertaining to new regulations, commenced during a 2009 gathering of G20 leaders. Subsequently, it was concluded in September 2010 and shared with the public. The 2008 global crisis brought serious financial risks and losses. Accordingly, Basel III aimed to protect the sector against sudden economic and financial shocks that may occur in the banking sector and ensure the importance of transparency and public disclosure that develop governance skills in banks.

2. Literature Review

Barth, Caprio, and Levine (2001) prepared a database on the regulation and supervision of banks in 107 countries with the survey they developed in their study in 2001. Their surveys of national bank regulators and supervisors cover market entry conditions, ownership restrictions, capital requirements, operating restrictions, external audit requirements, audit staff activities, credit classification and provisioning requirements, and quality aspects. Barth, Caprio, and Levine (2002), in their second study conducted in 2002, examined the relationship between the development, productivity, and fragility of the banking sector. In this study, they used the databases related to banking regulations and supervision that they developed for 107 countries. The findings of this study indicate that limitations imposed on bank activities have an adverse impact on the growth and stability of the banking sector. While there is not a significant correlation between restrictions on bank inflows and bank efficiency, it is suggested that there is a positive association between the inflow of foreign banks and the vulnerability of domestic banks. Barth, Caprio, and Levine (2008) and Barth, Caprio Jr, and Levine (2013) updated their data in 2008 and 2013 and carried out new studies on this subject.

Guiso, Sapienza, and Zingales (2006), in their analysis of the Italian banking system, used the degree of Italian states' restrictions on bank competition while examine the effects of banking regulations and deregulations. As a result, they determined that the cost of credit is high in places and regions where market entry is more limited, and high costs reduce profitability and indirect performance. They found that in the provinces where the regulations regarding competition in the banking sector are at their highest level, the ratio of non-performing loans rises above the current level as competition increases.

Nayak (2021), in his study examining the importance of regulations on bank performance using World Bank data, identified eight regulatory factors in 129 countries. The effect of eight factors on bank performance was estimated by multiple regression method. In the study, which examined the banking regulations of 129 countries using survey data from the World Bank, it was determined that the banking regulation criteria had an impact on both bank performance and risk management. According to the findings obtained from the results, external monitoring factors are the most important regulatory factors affecting risk management. In addition, it has been concluded that the financial performance of banks is mostly affected by the regulations regarding permitted activities. In his study examining the relationship between regulatory criteria and banking performance,Grigorian (2002) discovered that higher minimum capital adequacy ratios were associated with more aggressive deposit-taking practices and stronger income generation capabilities. Kale, Eken, and Selimler (2015) examined the effects of significant changes in regulations, macroeconomic changes, and political events in the Turkish banking sector between 1997 and 2013 on the efficiency of banks. Since the study does not only cover new regulations, a comprehensive analysis of the efficiency and performance of banks has emerged. According to the findings obtained from the study, it has been concluded that banks function better under greater regulation, monitoring, and restriction policies, more robust supervision, and more capital.

The impact of regulatory and supervisory elements on the effectiveness of banks was studied by Pasiouras, Tanna, and Zopounidis (2009). A data set for the study was constructed utilizing information from 615 publicly traded commercial banks that conducted business in 74 nations between 2000 and 2004. The information was estimated using stochastic boundary analysis. The study's findings led to the conclusion that regulatory requirements, which give regulatory agencies more power and promote market discipline, improve the cost and profit efficiency of banks. Additionally, he discovered that rules on bank activities had the opposite effect, whereas stricter capital requirements regulations increased cost efficiency but decreased profit efficiency. The Central Bank of Egypt raised the minimum capital adequacy ratio to 8% in 1991. According to Naceur and Kandil (2009) study on the impact of capital regulation requirements on intermediation costs and profitability, the Central Bank of Egypt raised the minimum capital adequacy ratio to 8% in 1991. In his investigation, he came to the conclusion that as capital adequacy rises, some impacts, such as greater capital-asset ratios, increased managerial effectiveness, improved liquidity, and a decline in inflation, raise the cost of intermediation.

Demirguc-Kunt, Laeven, and Levine (2003)studied the impact of bank rules, market structure, and national institutions on the bank's net interest margin and general expenses. They used data from more than 1400 banks in 72 countries to build the data set. He concluded that higher expenses for financial intermediation result from stronger rules on bank activities based on the results of his investigation. They also stressed the need to address private ownership and competition as well as bank regulations, which cannot be addressed separately. Tiryaki and Yılmaz (2012) developed a system for measuring financial stability and examined the scope and significance of the derived Financial Stability Index with respect to the primary banking regulatory instruments, which were determined as Capital Measure, Liquidity, Provision Policy, and Required Reserves, in both the short and long terms. According to the findings obtained from the study, it has been concluded that the equity ratio of the bank and financial stability move parallel, that there is an inverse relationship between liquid assets and financial stability, and that the relationship between required reserves and foreign resources and financial stability is also inverse. Demir (2016) examined the basic banking regulation tools, which were determined as capital adequacy, liquidity, total reserves, and required reserves, to ensure stability and their effect on the market behavior of banks using profitability performance criteria. According to the findings, it was concluded that the profitability indicators responded instantly to the shocks caused by the regulations, and the effects of the shocks caused by the regulations disappeared in the same period. Arican et al. (2019) examined the Basel Accords application and profitability in the Turkish banking sector, and they concluded that Credit Risk, Liquidity Risk, and Capital Adequacy negatively affected banking profitability, measured by Return on Assets and Return on Equity. As can be seen in the literature, studies have generally focused on a single country or a group of countries. Additionally, there aren't many studies that look at two or more of the effects of rules; most studies only look at one, such as performance, risk, profitability, or stability. In terms of contribution to the literature, our study analyzed four sample countries, which are not included in the same country group and differ from each other in terms of development levels, banking sector backgrounds, and financial infrastructures. Furthermore, the effects of banking regulations on both performance and risk were not examined in a single dimension.

3. Data, Methodology, and Empirical Model

3.1. Data

The Turkish banking sector data used in this study between 2010 and 2019 was obtained through the Central Bank of the Republic of Turkey (CBRT), Banks Association of Turkey (BAT), Banking Regulation and Supervision Agency (BRSA), Borsa Istanbul (BIST), and FinNet data bank program. Additionally, information for additional sample nations was gathered from the Central Banks of Serbia, Bosnia and Herzegovina, Croatia, and other international statistical networks. Moreover, macroeconomic data was reached through the databases of the World Bank, the International Monetary Fund, and the Bank for International Settlements. The sample years were chosen between 2010 and 2019, since these years marked a stable period for the sample countries during which the effects of the global crisis of 2008 subsided. The total data of 67 banks from the 4 countries was collected as a sample, and it was determined that 59 of them were suitable for analysis. 8 banks were not included in the analysis due to a lack of data and their recent date of establishment.
The variables used in the study are summarized in the table below.

Table 1. Variables used in analysis.

Variables		Abbreviations	Descriptions	Expected effect
Dependent variables				
Performance indicator	Return on assets ratio	ROA	Net profit / Total assets	+
Independent variables				
Regulation indicator	Capital adequacy	CA	Equity / Total assets	+
Regulation indicator	Liquidity	LQ	Liquid assets / Total assets	+
Regulation indicator	Total provisions	TP	Total provisions / Equity	+
Control variables				
Size indicator	The logarithm of total assets	LTA	The logarithm of total assets	+
Economy indicator	Gross domestic product ($)	GDP	Annual growth rate in gross domestic product	-
Inflation indicator	Inflation	INF	Annual rate of increase in consumer prices	-
Budget indicator	Budget deficit	DEFCT	Difference between country income and country expenditure	-
Trade indicator	Trade balance	BLNC	Import and export balance	-

The variables used in the analysis are shown in Table 1. Within the scope of the Basel Criteria, regulatory indicators include capital adequacy, liquidity approach, and total provisions utilized as regulatory criteria. These ratios are included in the analysis to measure the performance, profitability, and sensitivity of banks to risks in countries that accept the Basel criteria.

3.2. Methodology

In the study, it is seen that the data set created with 10 years of data from 4 countries and 53 banks is suitable for dynamic panel data analysis.

The main distinction between dynamic panel data models and other panel data models is the inclusion of the lagged value of the dependent variable as an independent variable. The Difference Generalized Method of Moments (DGMM) and the System Generalized Method of Moments (SGMM) of Arellano and Bond (1991) are two examples of dynamic panel data models (Arellano & Bover, 1995). Since SGMM is one of these methods that is more recent and also used in the study. Equation 1 presents the dynamic panel data model.

$$y_{it} = ay_{i,t-1} + \beta x'_{i,t} + n_i + v_{i,t} + \varepsilon_{i,t} \quad (1)$$

In the model, y_{it} represents the dependent variable, $ay_{i,t-1}$ represents lagged value of dependent variable, α represents the constant term, $\beta x'_{i,t}$ represents independent variables, n_i represents unobserved individual effects, $v_{i,t}$ represents unobservable time-specific effects, and $\varepsilon_{i,t}$ represents the error term. It is assumed that ni and $v_{i,t}$ are constant in the model.

3.3. Empirical Model

It has been determined that dynamic panel data analysis will be more appropriate for our study in line with the above-mentioned explanations regarding the panel data models in detail.

Equation 2 presents the panel data models as below.

$$ROA = \beta_0 + \beta_1 ROA_{i,t-1} + \beta_2 CA_{i,t} + \beta_3 LQ_{i,t} + \beta_4 TP_{i,t} + \beta_5 LTA_{i,t} + \beta_6 GDP_{i,t} + \beta_7 INF_{i,t} + \beta_8 BLNC_{i,t} + \beta_9 DFCT_{i,t} + \varepsilon_{it} \quad (2)$$

4. Findings and Discussion

In the first stage of the research, the descriptive statistics of the variables used in the models were examined and provided in the table.

Table 2. Descriptive statistics.

Variables	Mean	Standard deviation	Minimum	Maximum
ROA	0.848	2.374	-9.44	19.34
CA	0.195	0.0874	-0.0418	0.984
LQ	0.145	0.071	0.01	0.600
TP	0.095	0.131	0.0007	0.964
LTA	6.017	0.947	3.307	8.008
GDP	2.566	2.845	-2.392	11.200
INF	4.195	4.309	-1.584	16.333
BLNC	54.770	17.932	27.33	83.8
DFCT	-2.604	2.546	-7.6	1.81

Descriptive statistics regarding the variables of the study are given in Table 2. There are 530 observations for each variable. It is clear that there are differences among banks because the standard deviation value of the Return on Assets Ratio, one of our performance metrics, is larger than the average value. Even though banks are in the same country and subject to the same regulatory and supervisory criteria, they have differences in assets. This is because banks increase both their assets and liquidity, as well as their capital, just to comply with regulatory criteria. Banks can increase their capital and liquidity for different reasons, such as to find cheaper loans, increase their credit scores, and evaluate investment opportunities. In this particular scenario, the standard deviation values of the ROA variable exhibit a higher magnitude compared to the mean values. In other variables, the standard deviation values exhibited proximity to the mean values, indicating a general closeness of the data to the mean value. This is because we combined the data from different countries from a panel data set in accordance with the purpose of the analysis. In order to conduct a comprehensive and valid analysis, it is necessary to first assess the presence of a strong correlation between the variables. Correlation relationships for each model are given separately in the tables below.

Since no high correlation was found between the variables in the correlation matrices given in Table 3, the analysis will continue without making any changes to the model or variables.

The accuracy and reliability of the results are affected by whether or not there is cross-sectional dependence between the series and whether or not this is taken into account as the analysis goes on (Breusch & Pagan, 1980;

Pesaran, 2004). Accordingly, before the panel data analysis, it is necessary to test whether there is a cross-sectional dependence between the model and the variables used in the model. For this, Pesaran (2004) CD (cross-sectional dependence) test will be used. Pesaran (2004) CD test is used when the cross-section dimension is greater than the time dimension (N>T). Pesaran (2004) CD test results are presented in Table 4.

Table 3. Correlation matrix between independent variables.

Variables	ROA	CA	LQ	TP	LTA	GDP	INF	BLNC	DFCT
ROA	1.0000								
CA	0.2104	1.0000							
LQ	-0.0750	0.0955	1.0000						
TP	0.0061	-0.2064	-0.0337	1.0000					
LTA	0.1714	-0.2557	-0.4180	0.1993	1.0000				
GDP	0.2313	-0.0258	-0.2310	0.1737	0.4539	1.0000			
INF	0.0956	0.0268	-0.3898	0.0170	0.5455	0.2656	1.0000		
BLNC	-0.1951	0.0564	0.2970	-0.2079	-0.5030	-0.4507	-0.6805	1.0000	
DFCT	0.2647	0.0412	0.0618	0.0793	0.0638	0.6073	-0.2132	-0.1565	1.0000

Table 4. Cross-section dependency results by variable.

Pesaran (2004) CD test		
Variables	**CD-test**	**P-value**
ROA	8.359	0.000***
CAR	9.114	0.000***
LQT	8.158	0.000***
TPR	0.735	0.463
LTA	38.489	0.000***
GDP	49.701	0.000***
INF	56.696	0.000***
BLNC	30.444	0.000***
DFCT	42.71	0.000***

Note: *** Indicates significance at the 1 percent level. The numbers represent the test statistics of the related tests.

The results of the cross-section dependency tests based on the model are shown in Table 5.

Table 5. Cross-section dependency test for models.

Pesaran's cross-section dependency test		
Model	**Value**	**Probability**
ROA	4.975	0.0000***

Note: *** indicates significance at the 1 percent level. The numbers represent the test statistics of the related tests.

Since there is a cross-section dependency in the variables and models, the stationary variables now need to be examined with the 2nd generation unit root tests that take the cross-section dependency into account. The "Pesaran's CADF (Cross-sectional Augmented Dickey Fuller)" test was employed to examine the presence of a unit root with a constant and a trend in each variable. This test is applicable in scenarios where the cross-sectional dimension is either larger or smaller than the time dimension.

Table 6. Second generation unit root test (Fixed and trended) results.

Pesaran CADF testi					
Variables	**T-bar**	**Cv10**	**Cv5**	**Cv1**	**Z[t-bar]**
ROA	-2.985	-2.600	-2.730	-2.960	-3.524
CAR	-3.174	-2.600	-2.730	-2.960	-4.404
LQT(I)	-3.038	-2.600	-2.730	-2.960	-3.769
TPR(I)	-3.073	-2.600	-2.730	-2.960	-3.932
LTA(I)	-2.960	-2.600	-2.730	-2.960	-3.408
GDP	-4.014	-2.600	-2.730	-2.960	-8.326
INF	-3.137	-2.600	-2.730	-2.960	-4.231
BLNC	-1.912	-2.600	-2.730	-2.960	1.485
DFCT	-3.129	-2.600	-2.730	-2.960	-4.195

As it can be seen in Table 6, the results of the constant and trended Pesaran's CADF test indicate that the Z (t-bar) values for the LQT, TPR, LTA, and BLNC variables exhibits unit root behavior. These values are smaller than the critical values CV10- , CV5-CV1 in absolute units. However, after the first difference, these

variables become stationary. In addition, it is seen that there is no unit root in the ROA, CAR, GDP, INF and DFCT variables. Finally, the BLNC variable was excluded from the model because it could not be stabilized.

In Table 6, the analysis was extended by transforming the variables that exhibited a unit root, as indicated by the 2nd generation unit root findings, into stationary series through the application of first differences.

Preliminary feasibility tests were carried out for each model, and the appropriate econometric method was determined. In order to facilitate the comparison between the applied models and enhance the accessibility of the results, they have been consolidated into a single table, denoted as Table 7. The estimation results of the SGMM model are displayed in Table 7.

Table 7. System GMM analysis results.

	Dependent variables	**ROA**		
		Coefficient	**Std. err.**	**Prop**
Independent variables	ROA(t-1)	0.201	0.002	0.000***
	CAR	5.761	0.076	0.000***
	LQT	3.015	0.146	0.000***
	TPR	-0.814	0.097	0.000***
	LTA	0.579	0.041	0.000***
	GDP	-0.016	0.003	0.000***
	INF	-0.015	0.002	0.000***
	DFCT	0.263	0.005	0.000***
	Cons	0.339	0.0345	0.000***
	Number of groups	53		
	Number of observations	477		
	Wald x^2 ProbChi2	84383.52 0.0000***		
	Sargantesti P value	50.22282 (0.2089)		
	AR(1) AR(2)	-1.6077 (0.1079) -.06714 (0.9465)		

Note: *** indicates significance at the 1 percent level. The numbers represent the test statistics of the related tests.

According to the summary findings, the lagged value of the return on assets ratio positively and significantly affects the return on assets ratio. When examining the criteria for regulation, it becomes evident that capital adequacy has the most significant influence. Capital adequacy, with a coefficient of 5.761249, has a statistically positive and significant effect on the Return on Assets Ratio. A coefficient of 3.015087 demonstrates that liquidity, as an additional regulatory indicator, has a positive and significant impact on the profitability of banks. It is seen that the last regulation indicator, Provisions, has a statistically negative and significant effect on the return on assets with a coefficient of -0.814. In general, the importance given to the capital adequacy and liquidity of the banks in the sample countries is also reflected in their profitability and performance. The provisions set aside for the purpose of avoiding the risks cannot be converted into investments, thus affecting the profitability in a negative way. It is seen that the Logarithm of Total Assets included in the model as a growth indicator has a positive and significant effect on the performance indicator. The performance indicator is found to be negatively and significantly influenced by both Gross Domestic Product and Inflation, which are considered the control variables in the analysis. The final control variable, known as the DFCT, exhibits a positive and statistically significant association with the performance indicator.

5. Conclusion and Policy Implications

As a result of the analysis, the effect of capital adequacy is accepted as one of the most important indicators of banking regulations. As can be seen from the results of the analysis, the increases in Capital Adequacy positively and significantly affect the return on assets, which are used as dependent variables.

Liquidity, akin to capital adequacy, is a significant regulatory indicator employed in banking regulations. The findings of the study indicate that performance improves when the proportion of liquid assets to total assets rises. This is again proof of how important liquidity is as a regulatory indicator to increase profitability, just like capital adequacy. By increasing their liquid assets, banks provide protection against risks and increase their profitability by evaluating investment opportunities. During the 2008 global crisis, banks faced challenges arising from a shortage of liquidity. Consequently, banks have adopted measures to maintain elevated levels of liquidity, thereby safeguarding their own interests as well as those of their depositors and investors against potential risks.

It should not be forgotten that performance and risk in banks are not only related to regulations but there are internal and external dynamics that determine the factors in question. Banks do not raise the regulatory criteria used in the analysis just to comply with the Basel Criteria. Banks have the ability to enhance their capital adequacy in order to project a stronger and more substantial image, thereby facilitating access to foreign

syndicated loans at more favorable terms and bolstering their credit ratings. Like capital adequacy, liquidity can be increased or decreased outside the Basel criteria. Banks may want to keep their liquid assets at a high level and ready for investments other than basic banking activities. This situation, again according to Basel criteria, may be an indication that liquidity is not only a risk prevention tool, but also used as an assurance tool to evaluate the opportunities that may be encountered.

Provisions used for banking regulations in the study are another important regulatory indicator. Total provisions represent the amounts that banks set aside for expected or unexpected risks and losses. Especially after the global economic crisis, which became effective in 2008, the regulatory authorities started to monitor the compensation policies implemented by the banks more carefully. After the 2008 global economic crisis, it is recommended that response policies be determined independently of current economic activities, together with G20 decisions. The total provisions set aside by banks within their funds are also an indicator of how cautious they are against expected or unexpected risks. The analysis findings indicate that there is a negative relationship between the increase in total provisions and the performance variables in the sample countries. This may be an indication that response policies are not well managed in our sample countries. One of the most important measures against risks in terms of sectors is provisions. The banking sector and other industries have witnessed a notable increase in the adoption of precautionary measures in response to the unforeseen risks brought about by the global economic crisis of 2008. This has led to a heightened recognition of the significance of provisions. The expectation and fear of encountering a new crisis after the global economic crisis pushed the sectors to make more provision. As a result of this behavior, the increase in the provisions set aside by the banks may cause decreases in loans, which may lead to decreases in their performance and profitability.

When the control variables used in the study are examined, it is seen that GDP and Inflation negatively affect the return on assets. With the increase in GDP, it is natural that households' credit utilization decreases. This situation negatively affects the profitability of banks. In times of high inflation, the profitability of banks is expected to increase. However, interest rate volatility in the analyzed time series should also be taken into account. During periods of inflation, the occurrence of interest rate increases poses challenges for banks in selling loans, consequently leading to a decline in banks' profitability. It is seen that the increase in budget deficits, which is the last control variable, increases the return on assets ratio. The rise in the budget deficit will have an indirect impact on households, resulting in an increase in household borrowing levels. This situation can turn into an effect that increases the performance of banks due to the increase in loan sales.

Previous research in the literature has yielded findings that suggest a negative relationship between total provisions and performance indicators (Arican et al., 2019). In the study, the effects of banking regulations on the banking sector were examined in terms of profitability. Further studies can be done by expanding the sample country numbers and adding more than one dimension. The findings of the study should be approached within the framework of constraints. The most important constraint in this study is data and period constraint. In other words, it is possible to reach different results with different variables, methods, and periods.

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