



Factors Affecting Bank Profitability's During Crisis Periods in Eastern Europe and Türkiye: A Comparative Analysis



Doğu Avrupa ve Türkiye’de Kriz Dönemlerinde Banka Kârlılıklarını Etkileyen Faktörler: Karşılaştırmalı Bir Analiz

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<https://doi.org/10.25204/iktisad.1602992>

Abstract

Article Info

Paper Type:
Research Paper

Received:
17.12.2024

Accepted:
25.06.2025

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This study examines the profitability performance of banks in times of financial crisis in Türkiye, Russia, Georgia and Poland, which are the countries of Eastern Europe, and reveals which internal factors affect profitability. Panel data for banks cover sixteen-year-period from January 2007 to January 2023. The research sample is balanced panel data. The research examines the financial sector data of more than one country. Ridge regression method was preferred because there may be multiple linear problems in such a complex sample, and it is the analysis method that brings all variables together in a single analysis and gives the most optimum results. Return on Assets (ROA) and Return on Equity (ROE) were taken into account as dependent variables for the profitability of the bank in the research. The results of the study suggest that the profitability of the bank is significantly affected by internal determinants. The most important output of the study is that the non-performing loans have a negative impact on ROA and ROE during all crisis periods, this finding is the same in all countries and this effect fluctuates during crisis periods. Another important output is that the negative impact on the ROA, where the positive effects of the increase in liquid items of banks on equity tend to increase during periods of crisis, is also decreasing.

Keywords: Banking, bank performance, financial crisis, panel data analysis, financial forecasting.

Öz

Makale Bilgileri

Makale Türü:
Araştırma
Makalesi

Geliş Tarihi:
17.12.2024

Kabul Tarihi:
25.06.2025

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Tüm hakları saklıdır.



Bu çalışmada, Doğu Avrupa ülkeleri olan Türkiye, Rusya, Gürcistan ve Polonya’da finansal kriz dönemlerinde bankaların karlılık performansı incelenmiş ve karlılığı hangi içsel faktörlerin etkilediği ortaya konulmuştur. Bankalara ait panel veriler, Ocak 2007’den Ocak 2023’e kadar olan on altı yıllık dönemi kapsamaktadır. Araştırma örnekleme dengeli panel veridir. Araştırma birden fazla ülkenin mali sektör verilerini incelemektedir. Böyle karmaşık bir örnekleme çoklu doğrusal sorun yaşanma durumu olabileceği ve tüm değişkenleri tek bir analizde bir araya getiren ve en optimum sonuçları veren analiz yöntemi olduğu için Ridge regresyon yöntemi tercih edilmiştir. Araştırmada bağımlı değişken olarak bankanın kârlılığı için Varlık Getirisi (ROA) ve Öz Sermaye Getirisi (ROE) dikkate alınmıştır. Çalışmanın sonuçları, bankanın kârlılığının içsel belirleyicilerden önemli ölçüde etkilendiğini göstermektedir. Çalışmanın en önemli çıktısı, sorunlu kredilerin tüm kriz dönemlerinde ROA ve ROE üzerinde olumsuz bir etkiye sahip olmasıdır, bu bulgu tüm ülkelerde aynıdır ve bu etki kriz dönemlerinde dalgalanmaktadır. Bir diğer önemli çıktı ise bankaların likit kalemlerindeki artışın öz sermaye üzerindeki olumlu etkilerinin kriz dönemlerinde artma eğiliminde olduğu ROA üzerindeki olumsuz etkinin de azalmakta olmasıdır.

Anahtar Kelimeler: Bankacılık, banka performansı, finansal kriz, panel veri analizi, finansal tahmin.

Atıf / to Cite (APA): Yıldırım Kutbay, A., and Rençber, Ö. F. (2025). Factors affecting bank profitability's during crisis periods in Eastern Europe and Türkiye: A comparative analysis. *Journal of Economics Business and Political Researches*, 10(27), 608-621. <https://doi.org/10.25204/iktisad.1602992>

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1. Introduction

One of the most fundamental goals of a company is to remain sustainable in any competitive environment. To ensure sustainability, it is crucial for companies to continue maintaining their profitability. In general, profitability is defined as the gain obtained after all expenses made in a given period from a firm's income in a certain period are deducted. But beyond this definition, profitability is far more important for banks than other companies in terms of ensuring continued growth and development and increasing the trust of customers in the bank. It is also important in that it can provide maximum benefit to the shareholders. Banks operate in an environment where great competition is experienced with the spread of information, communication and technology use and where there are negative effects on profitability. In this context, banks are all aware of the importance of the concept of profitability for their companies, but it can be much more important to know how to increase profitability and factors that affect profitability. Especially in times of crisis, this information becomes even more valuable. In times of crisis, some banks try to protect their finances by taking risky measures, but because of limited experience and high risks, such actions can often lead to a worsening of their financial situation. Therefore, the study of the results of a combination of effective factors on the profitability of banks, on asset (active) profitability and equity profitability is the main topic of this study.

The main reason for the inclusion of the banks of Eastern European countries (Georgia, Russia and Poland) and Türkiye is the recent political-political and financial developments in this region. The start of the Russia-Ukraine war also raises the question of the rapid escalation of the competitive environment that grew with Covid-19, the increases in commodity prices and what effects of high inflation which has affected the whole world on the banking sector. In this study, the factors affecting the profitability of banks during the crisis periods are examined, and the policies followed by the next crisis as a result of the measures taken by banks are analyzed and the effects of these policies on profitability are investigated. In addition, this study provides important advice for companies and investors who have just entered the banking sector or are considering entering into it in terms of how they behave during times of crisis. Because the profit rate in a business, when compared to what is earned by competitors or other businesses, is considered an important indicator of whether a capital performs successfully and its probability of survival (O'Lincoln and Kuhn, 1989: 48). From an economic perspective, healthy profits are the main incentive for investment decisions. Low profit rates will reduce investment levels and act as a brake on the process of capital accumulation and growth. Therefore, it can be said that profitability is an important starting point in the analysis of economic crises. Being able to predict economic crises in advance is especially vital for banks that provide hot money to the sector. This study offers recommendations on how banks should act in times of crisis.

2. Literature Review

This research aims to reveal the dynamics within banks that affect bank profitability during crisis periods, how banks should act during these period, and which variables investors and researcher should take into account during these periods. In the literature, these determinants include bank-specific variables such as size, capital strength, credit risk (CR), cost management, liquidity and market power of the bank, sector-specific variables such as ownership and concentration, and macroeconomic conditions such as productivity and inflation growth (Athanasoglou et al., 2014; Dietrich and Wanzenried, 2014; Bolt et al., 2012; Rumler and Waschiczek, 2010; Albertazzi and Gambacorta, 2009; Bikker and Hu, 2002). This research should examine the firm-based variables of countries located in nearby geographies and experiencing the results of similar socio-economic variables and reveal the behavioral differences of these variables during crisis periods to reveal how investors, countries and managers who are considering investing on a global scale should behave in subsequent crisis periods. Because a company's ability to maximize its profit while ensuring

sustainability is of vital importance for the long-term survival of the company. In this context, Profitability is an indicator of a company's ability to make a profit and is an accurate method for measuring bank performance (Asngari, 2024: 698).

Profitability is as important for banks as it is for companies, especially for banks that have become public companies, is the key to maintaining the trust of customers and especially investors. Profitability is often measured in literature by various financial ratios, such as return on equity (ROE), return on assets (ROA) and return on investment (Aji Sumantri et al., 2022: 1457). In the literature, it can be said that ROE and ROA are both the most used methods for measuring profitability (DeYoung and Rice, 2004; Athanasoglou et al., 2008; Chiorazzo et al., 2008; Almazari, 2014; Batten and Vo, 2019). There is a lot of research in the literature on different variables that have an impact on ROA and ROE in the banking sector. We can list them as follows; Liu and Wilson (2010: 1855). The ratio of non-interest income to total activity in periods of working crisis, which observes the account data of all banks operating in Japan between 2000 and 2007, the, he investigated the effects of rates such as loan/asset ratio, equity/asset ratio on ROE, ROA and NIM. Trujillo-Ponce (2013: 574) studied the effects of Loans/Total Actives (%), Non-Performing Loans/Gross Loans (%), Loan Loss Rewards/Net Loans on ROA and ROE. Al-Abedallat (2017: 141) examined the data of Jordanian banks for 2000-2015 and examined the effects of deposits, assets and loans on ROA and ROE. The study of Aji Sumantri et al. (2022: 1456) aimed to examine the factors affecting the profitability of banking sector companies traded on the Indonesian Stock Exchange during 2015-2019. This study finds that earnings per share, debt/equity ratio, and price/note value significantly affect the return of equity. Khan (2022: 99) used the unbalanced panel data of 59 banks in his study, where he investigated the determinants of the profitability of banks operating in Gulf Cooperation Council (GCC) countries. Profitability is measured as return on assets (ROA) and equity on return (ROE) used as dependent variables. In the research, internal factors and gross national product were used as external factors. According to the results of the research, bank size and asset management have a significant and positive effect, while capital adequacy, financial risk, efficiency of activity and active quality have a negative and significant impact on equity return.

Financial crisis or financial stress is defined as a disruption where problems of wrong choices and moral hazard get worse, so that funds in the financial markets cannot be efficiently channeled into areas with the most efficient investment opportunities and that occurs in financial markets. Thus, a financial crisis causes financial markets to fail to function efficiently, and this leads to a sharp contraction in economic activity (Mishkin, 1992: 117-118). Times of crisis are dangerous situations for banks, one of the most important players in the financial system. Because in times of crisis, depositors can be uneasy and withdraw their deposits by attacking banks (Han and Melecky, 2016: 1).

Banks play a crucial role in the financial system by connecting various economic actors and performing essential functions in the global economy. Profitability remains their primary concern, serving as a fundamental factor for their survival and long-term sustainability. Notably, strong bank performance boosts depositor confidence, which in turn enhances their trust and participation in equity (Zaiane and Moussa, 2021: 381). The behavior of banks during crisis periods attracts the attention of not only customers but also shareholders and researchers.

In this context, numerous studies in the literature have explored this subject. For instance, Muda et al. (2013: 121) investigated the determinants of profitability for Islamic banks in Malaysia and examined the impact of the global financial crisis on their profitability. Their findings revealed that factors such as general expense ratio, loan ratio, deposit ratio, technical activity, and bank size have a positive and significant effect on bank profitability. Similarly, Kočíšová (2014: 121) found that the global financial crisis (2007–2009) had a substantial impact on the performance of the banking sector worldwide. This study identified the relationship between bank profitability (dependent variable) and both bank-specific and macroeconomic variables (independent variables), concluding that

profitability is primarily influenced by capitalization, liquidity, loan portfolio quality, operational efficiency, and market structure.

Le and Ngo (2020: 65) examined the determinants of bank profitability across 23 countries from 2002 to 2016, reporting that market power negatively impacts profitability. In terms of banks, the Deposit/Total Assets Ratio (DTAR) and Loan/Deposit Rate (LDR) are found to be negative and meaningful, while the Equity/Assets Ratio (EAR) and Debt/Equity Ratio (DER) are reported to have no positive/negative effects. As we can see, studies either cover a period of economic crisis or examine the impact of external factors in all periods of economic crisis. In this context, our research examines the effects of internal factors of banks on profitability during different periods of financial crisis and finds this in the context of banks of Eastern European countries and the Turkish banking sector.

3. Conceptual Framework

3.1. Variables Used in The Study

Our aim in the study is to identify the determining factors of bank profitability in Eastern European countries (Russia, Georgia and Poland) and Türkiye and to analyze the differences between countries during times of crisis. In this context, the variables included in the research can be expressed as follows. The main reason for including banks from Eastern European countries (Georgia, Russia and Poland) and Türkiye in the research is to reveal how recent political and financial developments in this region affect the banks, which are the most important financial actors in each country.

Dependent variables: In this study profitability is measured using the Return on Assets (active) (ROA) and Return on Equity (ROE). The ROA reflects a bank's ability to profit from the bank's assets, while the ROE shows shareholders' return on equity. The active collection rate of equity is considered to be the power of equity (Brahmaiah, 2018: 3057). The loans-to-total-assets ratio is used to assess whether the structure of the asset side of a bank's balance sheet impacts its profitability. This ratio indicates the percentage of a bank's total assets, including liquid items, that are allocated to loans. A higher value of this ratio suggests that the bank is less liquid. However, this higher value can also be associated with increased profitability.

Explanatory Variables: In the literature, the factors influencing bank profitability are generally categorized into two groups: internal (bank-specific) factors and macroeconomic (external) factors. This research includes the following internal factors: Equity/Total Assets, (Equity - Fixed Assets)/Total Assets, Total Deposits/Total Assets, Total Loans/Total Assets, Total Loans/Deposits, Non-Performing Loans/Total Loans, Fixed Assets/Total Assets, Liquid Assets/Total Assets, Liquid Assets/Deposits, and Liquid Assets/Foreign Resources ratios. Additionally, financial crisis periods have been incorporated as an external factor to provide further explanatory insights.

3.2. Method: Ridge Regression

In a dataset, the problem of multiple linear connections can cause a misguessing of regression coefficients, an exaggeration of the standard errors of regression coefficients, thereby increasing the confidence intervals and shrinking the t-test value. This may cause an important result to be incorrect or may lead to the result that the data causing this situation is excluded from the research. In this context, ridge regression and principal component regression methods are recommended, as they typically provide biased estimates to calculate regression coefficients without excluding variables from the models (Topal et al., 2010: 54). Despite the presence of multicollinearity among the variables-one of the main reasons for applying the ridge regression method-it is preferred in this study because it resolves this issue and enables analysis without the loss of variables.

In the literature, efforts have primarily focused on identifying the most suitable analysis methods by applying multiple regression techniques to financial sector data from a single country (Geraldo-Campos et al., 2022; Safi et al., 2023). This research contributes to the literature by introducing an innovative approach: it integrates financial sector data from multiple countries into a single analysis and achieves optimal results.

4. Implementation

4.1. Purpose, Scope, Data Set and Variables of the Study

This study aims to identify the factors influencing the profitability of private and public banks operating in Eastern European countries and Türkiye during periods of political and economic crises, to investigate whether these factors exhibit different effects during financial crises, and to analyze the underlying causes if such differences exist. The data set of the study is balanced panel data and covers the annual data of the private and public banks of the four countries for the periods of 2007-2023. The main research question of the study is “Do the factors affecting profitability in the banking sector differ according to the crisis periods or by countries?” At this point, it is possible to talk about two basic distinctions. The first of these distinctions is the country and the other is the crisis. In this context, the banks and countries included in the study are shown in Table 1.

Table 1. Countries and Banks Included in The Study

Country	Bank Name	Country	Bank Name
Türkiye	Akbank	Russia	Sberbank Rossii PAO
Türkiye	Albaraka Türk Katılım Bank	Poland	UniCredit SpA
Türkiye	ICBC Türkiye Bank	Poland	Santander Bank Polska SA
Türkiye	QNB Finans Bank	Poland	Banco Santander SA
Türkiye	Şekerbank	Poland	Bank Polska Kasa Opieki SA
Türkiye	Türkiye Garanti Bank	Poland	Bank Millennium SA
Türkiye	Türkiye Halk Bank	Poland	mBank SA
Türkiye	Türkiye İş Bank	Poland	Getin Holding SA
Türkiye	Türkiye Kalkınma ve Yatırım Bank	Poland	Bank Ochrony Srodowiska SA
Türkiye	Türkiye Sınai Kalkınma Bank	Poland	BNP Paribas Bank Polska SA
Türkiye	Türkiye Vakıf Bank	Poland	Bank Handlowy w Warszawie SA
Türkiye	Yapı ve Kredi Bank	Georgia	Bank of Georgia Group PLC
Russia	Gazprombank	Georgia	Halyk Bank AO
Russia	Rosbank	Georgia	Turkiye Is Bankasi AS
Russia	Rossel'khozbank	Georgia	Bank VTB PAO

The study covers three crisis periods and covers the first crisis period 2007-2012, the second crisis period 2013-2018 and the third crisis period 2019-2022 (Covid). The Ridge regression method was used in the study. The main reason for applying this method is that there is a multiple internal relationship problem, which is one of the classic regression analysis assumptions. As a result of the investigations, it was seen that the data showed normal distribution but the Variance Inflation Factor (VIF) value was generally above 10. This can be interpreted as the fact that independent variables are highly related to each other. For this reason, the Ridge Regression Analysis, which is frequently applied in the literature, was applied to eliminate these problems. The variables used in the research, the mathematical formulas of the variables and the abbreviations used in the research are presented in Table 2.

Table 2. Mathematical Formulas and Abbreviations of Variables Used in Research

Name of Variables		Abbreviations	Formulas of Variables
Dependent Variables	Active Profitability	ROA	Net Profit/Total Active
	Equity Profitability	ROE	Net Profit/Equity
Independent Variables	Equity Proficiency Rates-Capitalization	ETA	Equity/Total Actives
		EFTA	(Equity-Fixed Asset)/Total Asset
	Balance Sheet Structure Rate	TDTA	Total Deposit/Total Asset
	Asset Quality Rates	TLTA	Total Loans/Total Active
		TLD	Total Loans/Deposit
		LFTL	Non-Performing Loans/Total Loans
		FATA	Fixed Assets/Total Asset
	Liquidity Rates	LTTA	Liquid Total/Total Asset
		LAD	Liquid Asset/Deposit
		LAFR	Liquid Asset/Foreign Resource

4.2. Research of the Factors Affecting Profitability in Crisis Periods

To examine whether the factors influencing bank profitability vary across crisis periods, which constitutes one of the key research questions of the study, analyses were conducted using two regression models, with ROA and ROE as the dependent variables. The findings were presented in Table 3.

Table 3. Results for Crisis 1 Period (2007-2012)

Results for Model 1 (ROA)				Results for Model 2 (ROE)			
Variables		Rank	Coefficient (β)	Variables		Rank	Coefficient (β)
ETA		3	0.148	ETA		10	0.009
EFTA		2	0.154	EFTA		8	0.023
TDTA		3	0.148	TDTA		4	0.082
TLTA		1	0.185	TLTA		7	0.026
TLD		9	-0.013	TLD		2	-0.132
LFTL		8	-0.031	LFTL		1	-0.318
FATA		7	0.115	FATA		9	-0.013
LTTA		6	0.117	LTTA		3	0.110
LAD		10	-0.003	LAD		6	0.036
LAFR		5	-0.138	LAFR		5	0.063
MSE	0.008	RMSE	0.089	MSE	0.885	RMSE	0.941
MAE / MAD	0.063	MAPE	61.86%	MAE / MAD	0.744	MAPE	83.24%
R²	0.1			R²	0.3		

During the second crisis period, covering the period between 2013 and 2018, the ROA ratio of banks in absolute value was most positively (Equity Capital-Fixed Asset)/Total Asset, Equity Capital/Total Assets and Liquid Total/Total Asset; In terms of ROE, and it has been seen that they are Non-Performing Loans /Total Loans, Fixed Assets/Total Assets and Total Loans/Deposits, and of these, Non-Performing Loans /Total Loans and Total Loans/Deposits have a negative effect, while Fixed Assets/Total Asset have a positive effect. In the model, the level of independent variable disclosure was around 49% and 20%. The findings were presented in Table 4.

Table 4. Results for Crisis 2 Period (2013-2018)

Results for Model 1 (ROA)				Results for Model 2 (ROE)			
Variables		Rank	Coefficient (β)	Variables		Rank	Coefficient (β)
ETA		2	0.177	ETA		5	0.028
EFTA		1	0.182	EFTA		9	0.016
TDTA		4	0.15	TDTA		6	0.026
TLTA		5	0.144	TLTA		10	0.002
TLD		9	-0.009	TLD		3	-0.052
LFTL		8	-0.047	LFTL		1	-0.127
FATA		6	0.108	FATA		2	0.072
LTTA		3	0.169	LTTA		4	0.038
LAD		10	0.007	LAD		7	-0.025
LAFR		7	-0.065	LAFR		8	0.021
MSE	0.022	RMSE	0.148	MSE	0.867	RMSE	0.931
MAE / MAD	0.103	MAPE	86.46%	MAE/MAD	0.681	MAPE	82.61%
R²	0.491			R²	0.2		

During the third crisis period covering 2018 to 2022, it has been shown that the ratios that most affected the ROA ratio of banks in absolute value were Non-Performing Loans /Total Loans negatively and (Equity-Fixed Asset)/Total Assets and Equity/Total Assets positively; and in terms of ROE, Non-Performing Loans /Total Loans, Liquid Assets/Deposits and Total Loans/Deposits and that among these, Non-Performing Loans /Total Loans and Total Loans/Deposit have a negative while Liquid Assets/Deposit to have a positive effect. In the model, the level of independent variable disclosure was around 58% and 7%. The findings were presented in Table 5.

Table 5. Results for Crisis 3 Period (2018-2022)

Results for Model 1 (ROA)				Results for Model 2 (ROE)			
Variables		Rank	Coefficient (β)	Variables		Rank	Coefficient (β)
ETA		3	0.238	ETA		8	0.139
EFTA		2	0.271	EFTA		4	0.199
TDTA		9	0.036	TDTA		9	-0.043
TLTA		8	0.041	TLTA		5	-0.175
TLD		6	-0.061	TLD		3	-0.276
LFTL		1	-0.414	LFTL		1	-0.499
FATA		7	0.054	FATA		6	-0.171
LTTA		4	0.140	LTTA		7	0.163
LAD		5	0.095	LAD		2	0.340
LAFR		10	-0.023	LAFR		10	0.025
MSE	0.014	RMSE	0.118	MSE	0.96	RMSE	0.98
MAE / MAD	0.093	MAPE	42%	MAE / MAD	0.559	MAPE	176.66%
R²	0.579			R²	0.077		

4.3. Investigation of Profitability by Country

One of the primary questions of the study is to investigate whether the factors influencing bank profitability vary across countries. For this reason, four applications were made separately for Türkiye, Russia, Georgia and Poland at two model levels as dependent variables ROA and ROE. The results obtained were first interpreted separately and then comparatively.

Table 6. Examining the Factors Affecting Profitability for Türkiye

Results for Model 1 (ROA)				Results for Model 2 (ROE)											
Variables		Rank		Coefficient (β)		Variables		Rank		Coefficient (β)					
ETA		3		0.318		ETA		4		-0.02					
EFTA		1		0.371		EFTA		5		-0.015					
TDTA		5		0.239		TDTA		9		-0.007					
TLTA		8		-0.198		TLTA		1		-0.051					
TLD		10		0.104		TLD		6		-0.012					
LFTL		9		-0.124		LFTL		7		-0.01					
FATA		6		-0.223		FATA		2		-0.034					
LTTA		4		-0.315		LTTA		8		0.009					
LAD		6		-0.223		LAD		3		-0.023					
LAFR		2		0.337		LAFR		10		0.002					
MSE		0.55		RMSE		0.742		MSE		0.339		RMSE		0.582	
MAE / MAD		0.573		MAPE		175.18%		MAE / MAD		0.411		MAPE		133.47%	
R²		0.105						R²		0.003					

Considering the period between 2007 and 2022, it is seen that the factors that most affected the profitability of banks in absolute value for Türkiye in terms of ROA were positively (Equity-Fixed Asset)/Total Asset, Liquid Asset/Foreign Source and Equity/Total Actives; in terms of ROE that affected negatively were Total Loans/Total Active, Fixed Assets/Total Assets and Liquid Asset/Deposit. The level of independent variable disclosure was found to be 10% and 1%.

Table 7. Investigation of Factors Affecting Profitability for Russia

Results for Model 1 (ROA)				Results for Model 2 (ROE)			
Variables		Rank	Coefficient (β)	Variables		Rank	Coefficient (β)
ETA		1	0.434	ETA		2	0.167
EFTA		3	0.264	EFTA		3	0.121
TDTA		7	0.118	TDTA		9	0.003
TLTA		8	0.092	TLTA		7	-0.025
TLD		4	-0.242	TLD		5	-0.048
LFTL		6	0.123	LFTL		1	0.188
FATA		2	0.306	FATA		4	0.080
LTTA		10	-0.041	LTTA		6	-0.035
LAD		5	-0.138	LAD		10	-0.00049
LAFR		9	0.071	LAFR		8	-0.006
MSE	0.525	RMSE	0.725	MSE	0.411	RMSE	0.641
MAE / MAD	0.581	MAPE	224.77%	MAE /MAD	0.577	MAPE	190.36%
R²	0.468			R²	0.204		

For Russia, it has been seen that Equity/Total Actives, Fixed Assets/Total Assets and (Equity-Fixed Asset)/Total Asset positively affected the ROA ratio, one of the factors that affect the profitability of banks in the absolute value most; and that Non-Performing Loans /Total Loans, Equity/Total Actives and (Equity-Fixed Asset)/Total Asset ratios affected positively in terms of the ROE ratio. The level of independent variable disclosure was found to be 47% and 20%.

Table 8. Investigation of Factors Affecting Profitability for Georgia

Results for Model 1 (ROA)				Results for Model 2 (ROE)			
Variables		Rank	Coefficient (β)	Variables		Rank	Coefficient (β)
ETA		2	0.194	ETA		10	0.024
EFTA		1	0.203	EFTA		6	0.165
TDTA		5	0.140	TDTA		8	0.068
TLTA		3	0.160	TLTA		3	0.270
TLD		8	-0.023	TLD		2	-0.288
LFTL		10	0.007	LFTL		5	-0.167
FATA		6	0.130	FATA		4	-0.249
LTTA		4	0.154	LTTA		7	-0.096
LAD		7	0.049	LAD		1	0.864
LAFR		9	-0.017	LAFR		9	-0.036
MSE	0.019	RMSE	0.138	MSE	0.77	RMSE	0.877
MAE / MAD	0.106	MAPE	11.28%	MAE / MAD	0.621	MAPE	69.32%
R²	0.992			R²	0.384		

For Georgia, it has been seen that the factors which most affected the profitability of banks in absolute value were positively (Equity-Fixed Asset)/Total Asset, Equity/Total Actives and Total Loans/Total Active in terms of the ROA ratio, and Liquid Asset/Deposit, Total Loans/Deposit and Total Loans/Total Actives in terms of ROE ratio and that it has been observed that Total Loans/Deposit and Total Loans/Total Actives affected negatively and Liquid Asset/Deposit affected positively. The level of independent variable disclosure was found to be 99% and 38%.

Table 9. Investigation of Factors Affecting Profitability for Poland

Results for Model 1 (ROA)				Results for Model 2 (ROE)			
Variables		Rank	Coefficient (β)	Variables		Rank	Coefficient (β)
ETA		2	0.138	ETA		9	0.013
EFTA		3	0.130	EFTA		8	0.032
TDTA		8	0.034	TDTA		3	0.148
TLTA		8	-0.034	TLTA		7	-0.074
TLD		4	-0.076	TLD		2	-0.185
LFTL		1	-0.186	LFTL		1	-0.590
FATA		5	0.060	FATA		5	-0.080
LTTA		6	-0.042	LTTA		4	-0.115
LAD		7	0.036	LAD		6	0.078
LAFR		10	0.031	LAFR		10	0.011
MSE	0.118	RMSE	0.344	MSE	0.635	RMSE	0.797
MAE / MAD	0.275	MAPE	77.28%	MAE / MAD	0.62	MAPE	141.64%
R²	0.592			R²	0.038		

For Poland, it has been seen that the factors which most affected the profitability of banks were Follow-up /Total Loans negatively and Equity/Total Actives and (Equity-Fixed Asset)/Total Asset positively in terms of ROA, and Non-Performing Loans /Total Loans, Total Loans/Deposit negatively and Total Deposit/Total Assets ratio positively in terms of ROE. The level of independent variable disclosure was found to be 59% and 3.8.

5. Comparison of Findings

This study aims to investigate whether the factors influencing bank profitability vary across countries or during different crisis periods. For this reason, there have been three crisis periods and four country-level practices. The findings obtained are as in the table below.

Table 10. Factors affecting profitability in terms of ROA

	Crisis1		Crisis2		Crisis3		Türkiye		Russia		Georgia		Poland	
	Rank	Effect	Rank	Effect	Rank	Effect	Rank	Effect	Rank	Effect	Rank	Effect	Rank	Effect
ETA	3	+	2	+	3	+	3	+	1	+	2	+	2	+
EFTA	2	+	1	+	2	+	1	+	3	+	1	+	3	+
TDTA	3	+	4	+	9	+	5	+	7	+	5	+	8	+
TLTA	1	+	5	+	8	+	8	-	8	+	3	+	8	-
TLD	9	-	9	-	6	-	10	+	4	-	8	-	4	-
LFTL	8	-	8	-	1	-	9	-	6	+	10	+	1	-
FATA	7	+	6	+	7	+	6	-	2	+	6	+	5	+
LTTA	6	+	3	+	4	+	4	-	10	-	4	+	6	-
LAD	10	-	10	+	5	+	6	-	5	-	7	+	7	+
LAFR	5	-	7	-	10	-	2	+	9	+	9	-	10	+

When Table 10 is examined, it is seen that the most effective factor in the three crisis periods on the ROA variable is (Equity-Fixed Asset)/Total Asset ratio. While this ratio is seen to be of equal importance for Türkiye and Georgia, it is seen to be at the 3rd level of importance for Russia and Poland. In this context, when looking at the rates that vary in importance in the times of crisis, while Total Loans/Total Active ratio is important during the 1st Crisis, (Equity-Fixed Asset)/Total Asset ratio is seen during 2. crisis period and Non-Performing Loans /Total Loans ratio in 3. Crisis period, The Liquid Asset/Deposit ratio ranked 10th in the first two crisis periods whereas it climbed up to 5th in the last crisis period.

Table 11. Factors Affecting Profitability in ROE

	Crisis 1		Crisis 2		Crisis 3		Türkiye		Russia		Georgia		Poland	
	Rank	Effect	Rank	Effect	Rank	Effect	Rank	Rank	Effect	Rank	Effect	Rank	Effect	Rank
ETA	10	+	5	+	8	+	4	-	2	+	10	+	9	+
EFTA	8	+	9	+	4	+	5	-	3	+	6	+	8	+
TDTA	4	+	6	+	9	-	9	-	9	+	8	+	3	+
TLTA	7	+	10	+	5	-	1	-	7	-	3	+	7	-
TLD	2	-	3	-	3	-	6	-	5	-	2	-	2	-
LFTL	1	-	1	-	1	-	7	-	1	+	5	-	1	-
FATA	9	-	2	+	6	-	2	-	4	+	4	-	5	-
LTTA	3	+	4	+	7	+	8	+	6	-	7	-	4	-
LAD	6	+	7	-	2	+	3	-	10	-	1	+	6	+
LAFR	5	+	8	+	10	+	10	+	8	-	9	-	10	+

When Table 11 is examined, it is seen that the most effective factor in the three crisis periods on the ROE variable is the Non-Performing Loans /Total Loans ratio. This ratio is seen to be of equal importance for Russia and Poland, while it is seen that it has at 7th level of importance Türkiye and at 5th level for Georgia. In this context, when the order of importance is taken in crisis periods, Non-Performing Loans /Total Loans has been the most important impact factor in all crisis periods. It is seen that the Liquid Asset/Foreign Resource ratio (LVCI) decreased its affect and fell to the 10th place during the last crisis period.

When all the findings are evaluated together, it is seen that the Non-Performing Loans loans in all crisis periods affect ROA and ROE negatively (Table 3, Table 4 and Table 5). The Non-Performing

Loans can be expressed as the situation of the loan entering the narrow throat, which starts with the fact that the company uses the money collected as deposits to its customers for a certain return, and even the loans cannot be taken back. It is no coincidence that this situation has the same result on the basis of all countries. Because the most important problem of the banking sector is the problem in the collection of the loan given. This also causes material loss, as well as difficulty in fulfilling the responsibility towards the customer who has been deposited, and different costs (law costs, notary fees, etc.). The findings of the study find that the negative impact of follow-up loans continues to increase during periods of crisis. In addition, when three crisis periods are examined, it is seen that the positive effects of liquidity rates on ROE increases, where the negative effects on ROA decreases. Based on this finding, increasing the liquid stay of banks can be interpreted as both affecting and increasing the profitability of equity more and reducing the negative impact on ROA. Bourke (1989: 76) noted in his work on banks of European, North American and Austrian countries that liquidity has a positive impact on profitability. According to the study, the failure of banks is due to insufficient liquidity, while higher returns will be provided if more liquid assets are obtained.

6. Conclusions and Recommendations

This article examines how the internal factors of the bank affect the profitability of banks in the context of global financial crises. Since the beginning of the 21st century, all institutions in the world financial structure have been operating in an economic environment characterized by great uncertainties and this case has been changing the way these institutions work and ultimately affecting their profitability and long-term survival. So far, there has been a lot of studies on bank profitability. However, most of these studies have focused on the banking sectors of the western and developed countries and on single country banks in general. In this context, the contribution presented with this article can be explained as follows. First, the fact that the effects of bank-specific internal dynamics on profitability are revealed in times of crisis and the research on this on the basis of countries in similar geography deepen the literature. Second, whether this effect has changed during periods of global financial crisis in Eastern European countries and in Türkiye according to the years of crisis contributes to the literature. In this context, the roadmap that the countries within the scope of the research should follow during crisis periods can be summarized as follows. In order to increase ROA during crisis periods (according to Table 6), Türkiye should increase the (Equity-Fixed Assets)/Total Assets, Liquid Assets/Foreign Resources and Equity/Total Assets ratios, while in order to increase ROE, it should tend to decrease the Total Loans/Total Assets, Fixed Assets/Total Assets and Liquid Asset/Deposit ratios. In order to increase ROA during crisis periods (according to Table 7), Russia should increase the Equity/Total Assets, Fixed Assets/Total Assets and (Equity-Fixed Assets)/Total Assets ratios, as well as the Non-Performing Loans/Total Loans, Equity/Total Assets and (Equity-Fixed Assets)/Total Assets ratios in order to increase ROE. In order to increase ROA during the crisis periods (according to table 8), Georgia should increase the ratios of (Equity-Fixed Assets)/Total Assets, Equity/Total Assets and Total Loans/Total Assets; in order to increase ROE, it should decrease the ratios of Liquid Assets/Deposits, Total Loans/Deposits and Total Loans/Total Assets, which are Total Loans/Deposits and Total Loans/Total Assets, while increasing the ratio of Liquid Assets/Deposit. In order to increase ROA during the crisis periods (according to table 9), Poland should decrease the ratios of Non-Performing Loans/Total Loans and positively Equity/Total Assets and (Equity-Fixed Assets)/Total Assets; in order to increase ROE, it should decrease the ratios of Non-Performing Loans/Total Loans, Total Loans/Deposits and positively Total Deposits/Total Assets.

The findings of this study should be interpreted in light of its limitations. For instance, the classification of crisis periods in the analysis may be considered problematic, as there is no universally accepted timeline in the literature for when financial crises begin and end. This is because financial crises do not occur simultaneously or follow the same timeline across different countries.

However, Dietrich and Wanzenried (2014) attempted to address this issue by dividing the timeline into distinct periods, as done in this study. Additionally, the study's focus solely on commercial banks represents its most significant limitation.

Despite these constraints, the study contributes to the existing body of research, which presents mixed evidence on the determinants of bank profitability during financial crises (Molyneux and Thornton, 1992; Kibritçi Artar and Atılğan Sarıdoğan, 2011; Sarıtaş et al., 2016; Reis et al., 2016; Güngör and Dilmaç, 2020). Examining the effects of financial crises on the banking sector across multiple countries provides valuable insights into the sector. Furthermore, identifying the key factors influencing bank profitability during crisis periods enhances our understanding of the banking industry on a global scale.

References

- Aji Sumantri, M., Widajatun, V., Susanti, N., and Nugraha, N. (2022). The factors that affect the profitability of banks listed on the Indonesia stock exchange. *Central Asia & the Caucasus*, 23(1), 1456-1460. <https://www.ca-c.org/index.php/cac/article/view/100>
- Al-Abedallat, A. (2017). Factors affecting the profitability of banks: A field study of banks operating in Jordan. *European Scientific Journal*, 13(22), 141-162. <https://doi.org/10.19044/esj.2017.v13n22p141>
- Albertazzi, U., and Gambacorta, L. (2009). Bank profitability and the business cycle. *Journal of Financial Stability*, 5(4), 393-409. <https://doi.org/10.1016/j.jfs.2008.10.002>
- Almazari, A. (2014). Impact of internal factors on bank profitability: Comparative study between Saudi Arabia and Jordan. *Journal of Applied Finance and Banking*, 4(1), 125-140. <https://tinyurl.com/4pkbt3y2>
- Asngari, I. (2024). Testing of the structure-conduct-performance hypothesis for industrial banking profitability: Evidence from Indonesia. *Integrated Journal of Business and Economics*, 8(1), 696-710. <https://ojs.ijbe-research.com/index.php/IJBE/article/view/771>
- Athanasoglou, P., Brissimis, S., and Delis, M. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of international financial Markets, Institutions and Money*, 18(2), 121-136. <https://doi.org/10.1016/j.intfin.2006.07.001>
- Athanasoglou, P., Daniilidis, I., and Delis, M. (2014). Bank procyclicality and output: Issues and policies. *Journal of Economics and Business*, 72, 58-83. <https://doi.org/10.1016/j.jeconbus.2013.10.003>
- Batten, J., and Vo, X. V. (2019). Determinants of bank profitability—Evidence from Vietnam. *Emerging Markets Finance and Trade*, 55(6), 1417-1428. <https://doi.org/10.1080/1540496X.2018.1524326>
- Bikker, J. A., and Hu, H. (2002). Cyclical patterns in profits, provisioning and lending of banks and procyclicality of the new Basel capital requirements. *PSL Quarterly Review*, 55(221), 143-175. <https://tinyurl.com/2zwbw98t>
- Bolt, W., De Haan, L., Hoeberichts, M., Van Oordt, M., and Swank, J. (2012). Bank profitability during recessions. *Journal of Banking & Finance*, 36(9), 2552-2564. <https://doi.org/10.1016/j.jbankfin.2012.05.011>
- Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia. *Journal of Banking and Finance*, 13(1), 65-79. [https://doi.org/10.1016/0378-4266\(89\)90020-4](https://doi.org/10.1016/0378-4266(89)90020-4)
- Brahmaiah, B. (2018). Factors influencing profitability of banks in India. *Theoretical Economics Letters*, 8, 3046-3061. <https://doi.org/10.4236/tel.2018.814189>
- Chiorazzo, V., Milani, C., and Salvini, F. (2008). Income diversification and bank performance: Evidence from Italian banks. *Journal of Financial Services Research*, 33(3), 181-203. <https://doi.org/10.1007/s10693-008-0029-4>

- DeYoung, R., and Rice, T. (2004). Noninterest income and financial performance at US commercial banks. *The Financial Review*, 39(1), 101-127. <https://doi.org/10.1111/j.0732-8516.2004.00069.x>
- Dietrich, A., and Wanzenried, G. (2014). The determinants of commercial banking profitability in low-, middle-, and high-income countries. *The Quarterly Review of Economics and Finance*, 54(3), 337-354. <https://doi.org/10.1016/j.qref.2014.03.001>
- Geraldo-Campos, L. A., Soria, J. J., and Pando-Ezcurra, T. (2022). Machine learning for credit risk in the Reactive Peru Program: A comparison of the Lasso and Ridge regression models. *Economies*, 10(8), 188-209. <https://doi.org/10.3390/economies10080188>
- Güngör, B., and Dilmaç, M. (2020). Finansal kriz ortamlarında sermaye yapısının bankaların finansal performanslarına etkileri. *Muhasebe ve Finansman Dergisi*, 85, 153-172. <https://doi.org/10.25095/mufad.673717>
- Han, R., and Melecky, M. (2016). Financial inclusion for financial stability: Access to bank deposits and the growth of deposits in the global financial crisis. *World Bank Policy Research Working Paper No: 6577*, 1-24. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2312982
- Khan, S. (2022). Determinants of banks profitability: An evidence from GCC countries. *Journal of Central Banking Theory and Practice*, 11(3), 99-116. <https://doi.org/10.2478/jcbtp-2022-0025>
- Kibritçi Artar, O., and Atılgan Sarıdoğan, A. (2011). Küresel finansal krizin Türkiye’de bankacılık sektörü mali yapısına etkileri. *Marmara Sosyal Araştırmalar Dergisi*, 2, 1-17. <https://dergipark.org.tr/en/download/article-file/2269>
- Kočišová, K. (2014). Profitability determinants and the impact of global financial crisis. In *5th Central European Conference in Regional Science*, (pp. 396-406). <https://tinyurl.com/yewaydzj>
- Le, T. D., and Ngo, T. (2020). The determinants of bank profitability: A cross-country analysis. *Central Bank Review*, 20(2), 65-73. <https://doi.org/10.1016/j.cbrev.2020.04.001>
- Liu, H., and Wilson, J. O. S. (2010). The profitability of banks in Japan. *Applied Financial Economics*, 20(24), 1851-1866. <https://doi.org/10.1080/09603107.2010.526577>
- Mishkin, F. S. (1992). Anatomy of a financial crisis. *Journal of Evolutionary Economics*, 2, 115-130. <https://doi.org/10.1007/BF01193536>
- Molyneux, P., and Thornton, J. (1992). Determinants of European bank profitability: A note. *Journal of Banking & Finance*, 16(6), 1173-1178. [https://doi.org/10.1016/0378-4266\(92\)90065-8](https://doi.org/10.1016/0378-4266(92)90065-8)
- Muda, M., Shaharuddin, A., and Embaya, A. (2013). Profitability determinants and the impact of global financial crisis: A panel data analysis of Malaysian Islamic banks. *Research Journal of Finance and Accounting*, 4(7), 121-130. <https://tinyurl.com/yexwsem6>
- O’Lincoln, T., and Kuhn, R. (1989). Profitability and economic crisis. *Journal of Australian Political Economy*, (25), 44-69. <https://tinyurl.com/4j4mzf2x>
- Reis, Ş. G., Kılıç, Y., and Buğan, M. F. (2016). Banka karlılığını etkileyen faktörler: Türkiye örneği. *Muhasebe ve Finansman Dergisi*, (72), 21-36. <https://doi.org/10.25095/mufad.396715>
- Rumler, F., and Waschiczek, W. (2010). The impact of economic factors on bank profits. *Monetary Policy & the Economy*, 4(10), 49-67. <https://tinyurl.com/fmas3327>
- Safi, S. K., Alsheryani, M., Alrashdi, M., Suleiman, R., Awwad, D., and Abdalla, Z. N. (2023). Optimizing linear regression models with lasso and ridge regression: A study on UAE financial behavior during COVID-19. *Migration Letters*, 20(6), 139-153. <https://doi.org/10.59670/ml.v20i6.3468>
- Sarıtaş, H., Kangallı Uyar, S. G., and Gökçe, A. (2016). Banka karlılığı ile finansal oranlar ve makroekonomik değişkenler arasındaki ilişkilerin sistem dinamik panel veri modeli ile analizi: Türkiye araştırması. *Eskişehir Osmangazi Üniversitesi İİBF Dergisi*, 11(1), 87- 108. <https://gcris.pau.edu.tr/handle/11499/28005>
- Topal, M., Eydurhan, E., Yağanoğlu, A. M., Sönmez, A. Y., and Keskin, S. (2010). Çoklu doğrusal bağlantı durumunda ridge ve temel bileşenler regresyon analiz yöntemlerinin kullanımı. *Atatürk*

Üniversitesi Ziraat Fakültesi Dergisi, 41(1), 53-57.
<https://dergipark.org.tr/en/download/article-file/35348>

Trujillo-Ponce, A. (2013). What determines the profitability of banks? Evidence from Spain. *Accounting & Finance*, 53(2), 561-586. <https://doi.org/10.1111/j.1467-629X.2011.00466.x>

Zaiane, S., and Moussa, F. B. (2021). What drives banking profitability during financial crisis and political turmoil? Evidence from the MENA region. *Global Journal of Emerging Market Economies*, 13(3), 380-407. <https://doi.org/10.1177/09749101211031102>