

## Impact of Covid-19 on Banking Performance in the case of Bulgarian Bank System

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### Abstract

*After the World Financial and Economic Crisis, the frequency of bank performance analysis has increased. The reason for this is the negative effects of the crisis, which led to a total rethinking of business models and the behavior of bankers. And while analysts were looking for changes in the behavior of the determinants of bank performance indicators, the world faced a new factor – Covid-19, which gave a new impetus to the studies. Subject of research in this publication are the banks in Bulgaria, and the purpose of the analysis is to outline the determinants of bank profitability and efficiency in the conditions of Covid-19. The thesis advocated in the research is that the banks in Bulgaria are affected by Covid-19 in regards to their key performance indicators, but indirectly and do not fall within the outlined borderlines of a "collapse" of the system, in the context of the countries outside the euro area.*

*Keywords: bank performance, bank profitability, bank operating efficiency, ROE, ROA, Cost/Income, Covid-19*

*JEL Code: G1, G21*

### Introduction

The study of the determinants of bank performance gained new interest after the World Financial and Economic Crisis. Among the reasons for this are the attempts to discover the factors critical to the success of banks, especially in the part of financial performance (profitability and efficiency). A number of studies show that banks have been doing well since the 2008 crisis, albeit not so well compared to pre-crisis levels of profitability and operational efficiency. The experience of the institutions with the international regulatory framework for banks (Basel III legislation), transformations, competition, change in business models, etc. factors made them not only compliant, but also vigilant in all directions.

Covid-19 gives a completely new impetus to studies on this topic. Its direct negative impact on the financial stability of companies and households also affected the banking sector, which adopted the imposed rules of national and supranational institutions to protect the overall economic stability, including its own. But at the same time, Covid-19 brought back the "ghost" of 2008 and put to the fore problems related to high operating efficiency figures, non-performing loans, low profitability and squeezed interest margins.

Subject of research in this publication are the banks in Bulgaria, and the purpose of the analysis is to outline the determinants of bank profitability and efficiency in the conditions of Covid-19. The thesis advocated in the research is that the banks in Bulgaria are affected by Covid-19 in regards to their key performance indicators, but indirectly and do not fall within the outlined borderlines of a "collapse" of the system, in the context of the countries outside the euro area.

For the purposes of the analysis, an empirical model was created; it includes macroeconomic, directly related to Covid-19, and internal bank determinants.

### 1. Thesis statement and literature review

In the years just before Covid-19, the banks in Europe achieved stability, characterized by low profitability and high levels of operational efficiency, which put them at the centre of the analyses of many scholars throughout the whole period since the World Financial and Economic Crisis up to the end of 2022. The levels of capital adequacy, leverage, liquidity and non-performing loans indicate that the institutions are operating sustainably, but not sufficiently in all directions to significantly improve their overall performance.

Evidence for the stability of the system is provided by the data from the ECB's quarterly statistical reviews for the period 2019-2022. Data from the ECB's bulletin show that Tier 1 capital

has increased significantly compared to 2009 (from 9% then to over 15% now), including the one of CET1. The introduced methodology for determining liquidity cover ratio shows that the values of the indicator are close to 150% in the first quarter of 2020, at 100% norm.

*Table 1*

*Performance indicators of banks in the EU and the euro area 2018 – 2022*

Performance indicators Period	CET1 (%)	Tier 1 (%)	Capital Ratio (%)	Leverage full phase	NPLs (%)	ROE (%)	ROA (%)	Cost/Income (CIR) (%)
Q1'18	14,16	15,34	17,81	5,14	4,70	6,61	0,44	67,43
Q2'18	14,10	15,30	17,76	5,14	4,40	6,88	0,45	65,85
Q3'18	14,19	15,40	17,83	5,11	4,17	6,85	0,45	65,08
Q4'18	14,39	15,59	18,00	5,29	3,18	6,16	0,42	65,83
Q1'19	14,35	15,60	18,00	5,23	3,68	5,76	0,38	69,18
Q2'19	14,33	15,55	18,00	5,24	3,56	6,01	0,40	66,43
Q3'19	14,37	15,58	18,05	5,26	3,41	5,83	0,38	65,48
Q4'19	14,78	15,96	18,43	5,53	3,22	5,20	0,36	65,81
Q1'20	14,42	15,65	18,10	5,23	3,05	1,21	0,08	72,44
Q2'20	14,89	16,13	18,66	5,16	2,94	0,01	0,00	67,61
Q3'20	15,20	16,50	19,04	5,46	2,82	2,12	0,13	65,50
Q4'20	15,62	16,95	19,51	5,82	2,63	1,53	0,10	66,03
Q1'21	15,48	16,76	19,33	5,56	2,54	7,21	0,45	64,66
Q2'21	15,60	16,87	19,41	5,79	2,32	6,92	0,43	64,82
Q3'21	15,47	16,79	19,30	5,74	2,17	7,19	0,45	63,57
Q4'21	15,48	16,80	19,48	5,86	2,06	6,72	0,43	64,29
Q1'22	14,99	16,23	18,87	5,60	1,95	6,04	0,37	64,28
Q2'22	14,96	16,22	18,85	5,19	1,85	7,62	0,46	64,30

*Source: The table was compiled based on the ECB's quarterly statistical reviews for the period 2018-2022. (ECB, 2022).*

The stability and the high levels of normative indicators do not show the real performance of the activity including ROA, ROE, NIM and Cost/Income Ratio. At the end of 2019, bank profitability remained low (against tight interest margins and challenges for banks to improve operational efficiency). In the period Q1'18 - Q4'19, the decline in ROE was 27% of its value (from 6,61% to 5,20%), and in ROA it was 22% (from 0,44% to 0,36%). The levels of operational efficiency ("Cost/Income") remained stable, but quite high – between 65-66%, far from the acceptable 50%. With the remaining unresolved problems with non-performing loans in some of the countries, the average value of NPLs for the banking sector decreased – from 4,70% at the beginning of 2018 to 3,22% at the end of 2019.

The Covid-19 period had a strong negative impact on the profitability of the assets and of the equity for the entire EU and euro area banking sector. At the same time, operational efficiency levels also deteriorated, probably not so much due to cost growth, but rather due to reduced operating income (related to the allowed credit prolongation and a number of policies for management of non-performing loans in crisis conditions).

The recovery for the sector starts in early 2021, reaching the levels of 2018. There is also a trend towards a general decline in operational efficiency, and the reason for this is the accelerated policies of banks for digitization, remote provision of services and reduction of branch network and staff, as well as the resumption of normal bank operations.

In the post-Covid period the banks in the EU and the euro area seem to be achieving the pre-pandemic stability, and a condition defined as sustainable by the EBA and the ECB. Does the situation in the Bulgarian banking sector appear to be close to the overall picture of the European banking system?

Table 2

Performance indicators of the banks in Bulgaria for the period 2018-2022 (in %)

Period	CET1 (%)	Capital Ratio (%)	NPLs (%)	Leverage	ROA (%)	ROE (%)	NIM (%)	Liquidity Coverage Ratio (LCR) (%)	Loan Growth (%)	Deposit Growth (%)
Q1'18	18,93	20,40	4,60	10,46	1,10	8,88	3,12	327,90	2,92	-0,07
Q2'18	19,31	20,82	4,40	10,83	1,60	13,30	3,19	315,10	0,24	2,96
Q3'18	18,55	20,01	4,10	10,47	1,58	13,02	3,12	322,20	4,77	2,83
Q4'18	18,93	20,40	3,90	10,01	1,59	12,11	3,15	294,00	3,58	1,28
Q1'19	17,88	19,97	3,80	9,98	1,14	8,73	3,08	289,10	2,45	2,00
Q2'19	19,36	20,54	3,70	11,41	1,69	12,98	3,03	260,60	2,88	0,35
Q3'19	19,84	21,02	3,90	11,11	1,52	11,82	2,95	264,00	2,77	2,95
Q4'19	19,10	20,22	3,50	10,55	1,47	11,63	2,88	269,90	3,75	2,84
Q1'20	19,37	20,37	3,50	11,29	1,03	8,11	2,96	261,00	-4,69	0,29
Q2'20	22,10	23,14	3,60	11,69	0,89	6,99	2,81	258,00	-1,35	0,27
Q3'20	21,86	22,93	3,40	11,48	0,78	6,19	2,77	268,70	1,96	3,46
Q4'20	21,81	22,86	3,10	10,79	0,66	5,31	2,76	279,00	1,51	4,54
Q1'21	21,53	22,54	3,10	10,85	1,10	8,93	2,61	294,10	4,86	2,52
Q2'21	21,96	22,94	2,90	10,90	1,03	8,21	2,58	272,50	2,40	0,94
Q3'21	21,41	22,36	2,70	10,61	1,10	8,93	2,54	281,90	2,19	3,57
Q4'21	21,66	22,62	2,50	10,50	1,05	8,53	2,60	274,10	-1,80	1,85
Q1'22	20,86	21,88	2,20	10,34	1,56	13,17	2,60	265,30	6,90	3,73
Q2'22	20,16	21,09	2,20	10,20	1,43	12,45	2,56	265,30	2,53	1,73

Source: Banks in Bulgaria, quarterly bulletin of the BNB for the period 2018-2022 (Bulgarian National Bank, BNB, 2018-2022).

The quarterly values of the indicators for the pandemic period show a significantly better picture for the sector than the average for Europe. The banks in Bulgaria have better capital adequacy, return and operational efficiency, better leverage (according to Basel III standards – above 3), and levels of non-performing loans corresponding to the ones in Europe.

The data from the two years preceding Covid-19, both at EU level and at Bulgarian level, confirm the stability. But then the shock at the end of the first quarter of 2020 is huge – profitability has deteriorated sharply, although not as much as in the countries in the EU and the euro area. Even in the quarters during the crisis, the profitability of the banks in Bulgaria is higher than the typical "stability" for the European banking system. A concomitant Covid-19 process is that of a slowdown in credit growth.

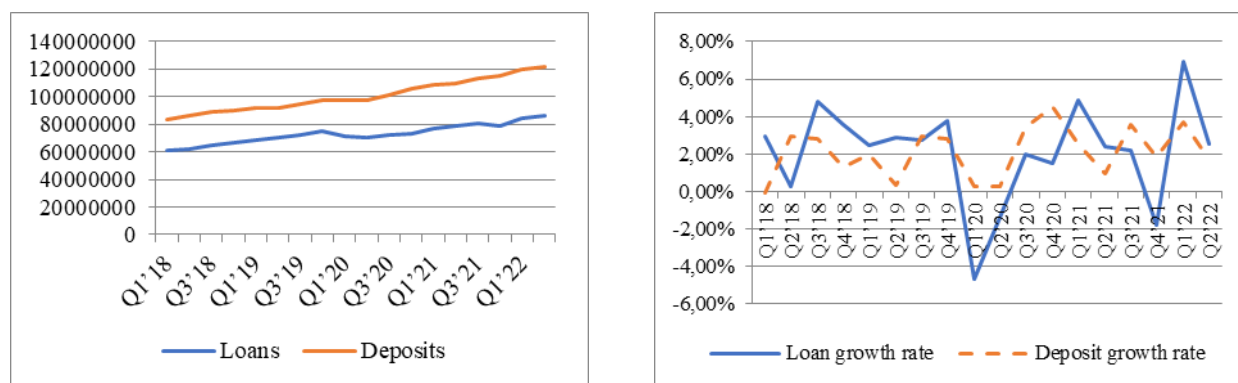


Figure 1. Loans and deposits – values and growth rate

The change in the indicators is also related to the main drivers of banking activity – deposits and loans. The percentage change in loans is negative for the first and second quarters of 2020 (the beginning of Covid-19), as well as for the fourth quarter of 2021 (at the peak of morbidity). The situation with the deposits is similar, only it does not come to a negative rate of change, but to a contraction of growth in the same quarters. For the period from the beginning of 2020 to today, positive signals are given by the first quarter of 2021 and the first quarter of 2022, before and after which the results show strong volatility in a negative direction for bank lending and resource sources. The results of the second quarter of 2022 are not a direct result of Covid-19, but of various other factors – war, energy crisis, high inflation.

The above-mentioned data and analysis of the behaviour of parts of the bank performance represent its state without highlighting the actual reasons for it, which necessitates the building of a model for their evaluation.

Similarly to the years following the World Financial and Economic Crisis, Covid-19 has opened new horizons for analysing bank performance. One of the first comments and attempts to assess the pandemic impact on the banking sector are those of the largest supervisory financial institutions – the European Bank Authority ("The EU Banking Sector: First Insights into the COVID-19 Impacts" (European Banking Authority, 2020), followed by the overview of the European Central Bank ("COVID-19 Vulnerability Analysis: Results Overview") (European Central Bank, 2020), and that of the International Monetary Fund ("COVID-19: How Will European Banks Fare") (Aiyar, Shekhar, Mai Chi Dao, Andreas A. Jobst, Aiko Mineshima, Srobona Mitra, and Mahmood Pradhan, 2021).

Initial assessments of the sector are related to an analysis of concerns and critical areas for banks – capital, asset quality, profitability, and efficiency. The EBA's concerns are that in countries with interest moratoriums in place, banks will bear the brunt of the effects of Covid-19, and if economic agents need additional funds, governments and central banks will have to provide the desired liquidity. And if the change in the conditions for treating and repaying non-performing loans leads to a temporary suspension of this problem, the expectations for low interest margins in the future do not portend a change in profitability. A challenge for performance are also the levels of operating expenses, which keep the Cost/Income value high; and the fastest way to reduce these expenses is to reduce personnel and close branches, which has a negative effect on the bank's image and reputation.

In an IMF study on the impact of Covid-19 on European banks, Aiyar et al. (Aiyar, Shekhar, Mai Chi Dao, Andreas A. Jobst, Aiko Mineshima, Srobona Mitra, and Mahmood Pradhan, 2021) present three perspectives of analysis: through profitability, asset quality and risk exposures. Their assessment (based on 467 banks from 40 European countries) leads to the conclusion that even if the pandemic significantly reduces the institutions' capital, the buffers are reliable enough to withstand its impact. They also find significant differences between countries: larger capital impacts are found in countries more affected by the pandemic, as well as for banks with initially high levels of non-performing loans and large exposures in the hard-hit sectors. The authors' forecast is for greater erosion of capital adequacy in countries outside the euro area and a decline to levels of 10.8% at the end of 2021.

A broader view of the impact of the pandemic is also given by Xiazi and Shabir (Xing Xiazi, 2022). In a study of 1575 banks in 85 countries for the period 2020Q1 to 2021Q4, they find that Covid-19 has a significant impact on bank performance, but according to the characteristics of the bank and the country in which it operates. The analysis finds that the pandemic has a more adverse impact on efficiency for smaller and undercapitalized banks, while larger, more liquid, and well-diversified banks manage to reduce this negative impact. Xiazi and Shabir see support for the institutions stability in the institutional environment and the financial development of the respective economy.

In a narrower geographical range is the analysis of Kozak (Kozak, 2021). Based on a study of 141 institutions from Central and Eastern Europe (there are 6 for Bulgaria), he found that the banks in the CEE countries (CESE) are well capitalized and withstand the requirements of Basel III, despite the growth of non-performing loans. The resilience of local banking sectors varies and is higher in non-EU countries. Smaller and non-public banks show a greater ability to manage and preserve equity, and larger ones have better profitability during a crisis.

Miklaszewska et al. (Miklaszewska, Kil, & Idzik, 2021) put emphasis on the impact of Covid-19 on the risk and return of the banking sector of the countries of Central, Eastern and Northern Europe (Czech Republic, Hungary, Poland, Slovakia, Estonia, Latvia, and Lithuania). For them, the digital focus helps the large banks of the studied region to cope with and compensate for the problems revealed by the panel analysis (panel data model), namely: traditional sources of income based on intermediation and interest do not contribute positively not only to profitability, but also for the stability of the institutions.

An even more comprehensive assessment (banks from 125 countries) of the impact of Covid-19 on the banking sector (lending and profitability) is that of Çolak and Öztekin (Gönül Çolak, 2021). According to them, the effect of the pandemic on bank loan growth depends on bank- and country-specific factors. Bank lending during the COVID-19 crisis has strengthened in countries with tighter regulations and supervision, greater financial development, better institutional quality, and better health policies, while the supply of bank credit has weakened in countries with greater competition from foreign banks and limited sources of corporate credit.

The analysis by Li et al. (Li, Feng, Zhao, & Carter) supports that of Çolak and Öztekin. According to them, the economic effect of the pandemic is leading to tightened credit standards and reduced demand for many types of credit. A positive factor for profitability is interest income, but it is inversely proportional to risk. Or diversified sources of income play a leading role in strengthening the bank's performance during a crisis and reduce the risk associated with the bank's activity.

A research was also provided by Dung Viet Tran, M. Kabir Hassan, Ahmed W. Alam, Nam Dau (Dung Viet Tran, 2022). They find that for the duration of the pandemic (2020:Q1 to 2021:Q1) a decline is seen in lending and in asset quality, as well as in banks' profit margins. Banks also suffer from accounting and market-based risk, which further reduces their stability. There are additional concerns regarding a decline in the profitability of assets and the level of general capital adequacy.

The conclusions of the general analysis of the picture in Bulgaria, as well as the studies of some elements of the performance in the analysts' researches, indicate that Covid-19 has a negative impact on the profitability, efficiency, and growth rate of loans (the main source of income generation of non-investment banking). What is the situation in Bulgaria, and do the results support the general vision of the effect of Covid-19 on banking performance?

## **2. Methodology and experimental methods**

The afore-presented studies (of the impact of Covid-19 on the banking sector) cover banks from different economies, with different profiles and the degree of impact of Covid-19 on them. The present study includes 17 Bulgarian banks (170 observations) examined in the period Q1'2020 – Q2'2022. Bulgarian Development Bank is excluded from the analysis, due to its different management style, being owned by the Bulgarian state.

The data in the research were collected and processed based on the information published in the quarterly bulletin of the BNB "Banks in Bulgaria", as well as information available on the NSI website (gross domestic product and inflation) and the Unified Information Portal (for the numbers

of Covid-19 cases and persons who died from Covid-19). Some limitations of the analysis are imposed due to lack of public data on banks' capital adequacy and non-performing loans by quarter.

For the purposes of the study, linear regression models were compiled, in which ROA, ROE, Cost/Income, Credit Growth play the role of dependent variables. The range of independent factors includes determinants internal and external to the bank, both of intrabank origin and at the level of a macroeconomic indicator or one related to Covid-19. Among the independent variables are the following indicators: bank size (amount of assets), "Loans/Deposits", share of loans, "Impairments/Loans", non-performing loans, capital adequacy, leverage ratio, liquidity coverage ratio, etc.<sup>1</sup> The dependent variables added to them, which can also act as determinants of the other indicators, are: return on assets (ROA), return on equity (ROE), net interest margin (NIM), operational efficiency (Cost to Income, CIR). And since the present study looks for the effect of Covid-19 on banks (even if indirect), gross domestic product, new cases of Covid-19 and deaths from Covid-19 have been added to them.

After testing the significance of the individual independent variables and their influence on the dependent ones, some of the above-mentioned determinants were removed, mainly due to high correlation, high multicollinearity or insignificant influence, and for others there was no quarterly information for individual institutions (non-performing loans and the three capital adequacy (non-performing loans, capital ratio, tier 1, CET1)).

Thus, the determinants listed in the table 3 participate in the assessment equations. Since the study evaluates institutions during Covid-19, the equations also include the leading indicator for the economy – GDP, as well as one of the two indicators for Covid-19 – the mortality.

**Table 3**

**Dependent/Independent variables and equations**

<b>Dependent/independent variables</b>	<b>Equations:</b>
ROA CostsToIncome, NIM, ImpairmentsToLoans, LnGDP, LnDeathCases.	$ROA = \alpha + \beta_1 * CostToIncome_{it} + \beta_2 * NIM_{it} + \beta_3 * ImpairmentsToLoans + \beta_4 * LnGDP_i + \beta_5 * LnDeathCases_{it} + D_t + \epsilon_i$
<b>ROE</b> CostsToIncome, ImpairmentsToLoans, LnGDP, LnDeathCases, LoansGrowth, ROA	$ROE = \alpha + \beta_1 * CostToIncome_{it} + \beta_2 * ImpairmentsToLoans + \beta_3 * LnGDP_i + \beta_4 * LnDeathCases_{it} + \beta_5 * LoansGrowth + \beta_6 * ROA + D_t + \epsilon_i$
CostToIncome LnDeathCases, LnAssets, ImpairmentsToLoans, ROE, LnGDP, NIM	$CIR = \alpha + \beta_1 * ROE_{it} + \beta_2 * ImpairmentsToLoans + \beta_3 * LnGDP_i + \beta_4 * LnDeathCases_{it} + \beta_5 * LnAssets + \beta_6 * NIM + D_t + \epsilon_i$
LoansGrowth – InflationRate, LnNewCovidCases, LnDeathCases, LnGDP	$LoansGrowth = \alpha + \beta_1 * InflationRate_{it} + \beta_2 * LnGDP_i + \beta_3 * LnDeathCases_{it} + \beta_4 * LnNewCovidCases + D_t + \epsilon_i$

where:

- ROA, ROE, NIM, CIR, LoanGrowth – dependent variables;
- D<sub>t</sub> – dummy variables for the quarters;
- i- bank identifier;
- t-the period;
- α - constant.

<sup>1</sup> Проучване на детерминантите на рентабилността и възможната им приложимост за оценка на българската банкова система е направено в: Pancheva, Al. Profitability of banks in Bulgaria between the World Financial Crisis and Covid-19, Journal Izvestiya, University of Economics Varna, 4/2022, .

- $\beta$  – coefficient showing the influence of the independent variable on the value of the dependent ROA/ROE/CIR
- $\varepsilon$  - the statistical error

The results of the analysis should reveal the degree to which each of the indicators determines the corresponding independent variable. But even the lack of direct influence of each of them should indicate the possible mechanisms of transmission of the Covid-19 effect on the entire banking sector.

### 3. Results and discussion

Testing the determinants of ROA left the following independent variables included in the model: GDP, Impairments, Net Interest Margin, Operating Efficiency and Covid-19 Deaths (LnGDP, ImpairmentsToLoans, NetInterestMargin, CostToIncome and LnDeathCases). The last of them – LnDeathCases – is statistically insignificant, which does not represent the direct strong impact of Covid-19 on banks in Bulgaria. When testing with the number of newly infected cases, the statistical significance of the indicator is even greater.

Table 3

Model Summary – ROA valuation

Model Summary <sup>b</sup>										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	,737 <sup>a</sup>	,544	,530	,0036966	,544	39,114	5	164	,000	2,036
a. Predictors: (Constant), CostsToIncome, LnDeathCases, NIM, LnGDP, ImpairmentsToLoans										
b. Dependent Variable: ROA										

The value of the coefficient of determination (R square) shows that 54,4% of the ROA value depends on these factors. The F-statistics, VIF values (below 5) as well as the Durbin-Watson coefficient value allow the model to be accepted as credible.

When replacing the independent variable LnDeathCases with LnNewCovidCases, R square increases to 0,546 (54,6% determinacy), but again the independent variable related to Covid-19 remains statistically insignificant in determining the return on bank assets (Sig.=0,063).

The greatest positive impact on the value of ROA have NIM (+) and LnGDP(+), and the rest have a negative effect (the impairments and operating efficiency). Despite the statistical insignificance, the direction of impact of the number of Covid-19 deaths is negative.

Table 4

ROA valuation - Coefficients

Coefficients <sup>a</sup>													
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
		1	(Constant)	-,097			,025		-3,828	,000	-,147	-,047	
	LnGDP	,010	,003	,278	4,179	,000	,006	,015	,311	,310	,220	,629	1,590
	ImpairmentsToLoans	-,175	,053	-,303	-3,295	,001	-,280	-,070	,386	-,249	-,174	,328	3,047
	NIM	,122	,015	,726	7,957	,000	,092	,153	,513	,528	,420	,334	2,994
	LnDeathCases	,000	,000	-,109	-1,658	,099	-,001	,000	,103	-,128	-,087	,641	1,561
	CostsToIncome	-,012	,001	-,494	-8,872	,000	-,014	-,009	-,433	-,569	-,468	,897	1,114

a. Dependent Variable: ROA

Testing the determinants of ROE found that the factors included in the model – loan growth, impairments, deaths from Covid-19, operational efficiency, return on assets and GDP (LoansGrowth, ImpairmentsToLoans, LnDeathCases, CostsToIncome, ROA, LnGDP) determined 87, 4% of the value of the indicator (coefficient of determination R Square 0,874). Of the mentioned variables, the LnDeathCases indicator is again statistically insignificant (Sig.=0,991).

**Table 5**

**Model Summary – ROE valuation**

Model Summary <sup>b</sup>										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	,935 <sup>a</sup>	,874	,869	,0138774	,874	188,299	6	163	,000	1,854
a. Predictors: (Constant), LoansGrowth, ImpairmentsToLoans, LnDeathCases, CostsToIncome, ROA, LnGDP										
b. Dependent Variable: ROE										

The multicollinearity statistic indicates that the model is admissible, and the F-statistic, multicollinearity test VIF (below 5) and Durbin-Watson values confirm this.

**Table 6**

**ROA valuation - Coefficients**

Coefficients <sup>a</sup>														
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Correlations			Collinearity Statistics		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF	
1	(Constant)	-.297	,099		-2,991	,003	-.494	-.101						
	CostsToIncome	-.043	,005	-.251	-8,022	,000	-.053	-.032	-.578	-.532	-.223	,790	1,265	
	ImpairmentsToLoans	-.767	,125	-.186	-6,149	,000	-1,013	-.521	,189	-.434	-.171	,842	1,187	
	LnGDP	,033	,010	,122	3,305	,001	,013	,052	,341	,251	,092	,569	1,758	
	LnDeathCases	-8,156E-6	,001	,000	-.012	,991	-.001	,001	,121	-.001	,000	,629	1,590	
	ROA	5,808	,250	,816	23,232	,000	5,314	6,301	,882	,876	,646	,627	1,595	
	LoansGrowth	-.052	,015	-.098	-3,456	,001	-.082	-.022	-.027	-.261	-.096	,966	1,035	
a. Dependent Variable: ROE														

With a positive impact on the return on equity is the return on assets and the gross domestic product, while the other determinants have a negative impact – operating efficiency, impairments, and the change in credits.

The third factor assessment is that of the operational efficiency indicator – Cost/Income. Its main predictors are: LnDeathCases, LnAssets, ImpairmentsToLoans, ROE, LnGDP and NIM. The coefficient of determination indicates that the above factors determine 63% of its value. Durbin-Watson levels as well as F-statistics determine model eligibility and its results.

**Table 7**

**Model Summary – Cost to Income valuation**

Model Summary <sup>b</sup>										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	,794 <sup>a</sup>	,630	,617	,1393607	,630	46,321	6	163	,000	1,880
a. Predictors: (Constant), LnDeathCases, LnAssets, ImpairmentsToLoans, ROE, LnGDP, NIM										
b. Dependent Variable: CostsToIncome										

The resulting values of Sig. bring to the fore the influence of all, without one of the determinants – persons who died of Covid-19. When testing the model with data on new Covid-19 cases, significance is even lower. This suggests that there is no direct influence on the efficiency of the banks in our country.



Table 8

*Cost to Income valuation - Coefficients*

Model		Coefficients <sup>a</sup>												
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Correlations			Collinearity Statistics		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF	
I	(Constant)	-1,730	1,014		-1,707	,090	-3,731	,271						
	ROE	-3,617	,325	-,617	-	,000	-4,260	-2,975	-,578	-,657	-,529	,736	1,358	
	NIM	3,034	,627	,431	4,835	,000	1,795	4,273	,018	,354	,230	,286	3,499	
	LnAssets	-,063	,010	-,348	-6,486	,000	-,082	-,044	-,555	-,453	-,309	,788	1,269	
	ImpairmentsToLoans	-10,381	2,003	-,430	-5,182	,000	-14,337	-6,425	-,177	-,376	-,247	,329	3,037	
	LnGDP	,328	,099	,208	3,298	,001	,132	,525	-,015	,250	,157	,569	1,758	
	LnDeathCases	-,003	,007	-,023	-,383	,702	-,017	,011	,013	-,030	-,018	,632	1,582	

a. Dependent Variable: CostsToIncome

When evaluating the impact of Covid-19 on efficiency, the processes accompanying it should also be taken into account – accelerated digitalization, with which banks reduce their operating costs, against the background of reduced revenues, which neutralizes the direction of impact.

The last assessment sought (caused by the interest of other studies in this indicator) is that on credits. The determinants selected here are related to the macro environment. The analysis shows that GDP, Inflation Rate, Covid-19 cases and Covid-19 deaths cases have no impact on the change in lending – R square=0,053. In addition, the relationship between Covid-19 and macro indicators is more than visible, expressed in the extremely high VIF values (over 70) and correlation coefficients exceeding the permissible ones, which is why the results of the analyses in the above studies cannot be confirmed.

**Conclusion**

The assessment of bank performance requires defining possible determinants, directly or indirectly related to it. The determinants included in the present study were selected from the traditional principal determinants for the sector based on testing their significance for a particular internal or external indicator. In this case, the study was supplemented with an indicator for measuring the negative impact of the pandemic – the number of people who died from Covid-19.

The general evaluation of the indicators shows that, unlike the wider-ranging researches, in the Bulgarian banking system there is no direct impact of Covid-19; and the leading key performance indicators are the already known traditional ones. This is partly due to the imposed measures, and also due to the better levels of these indicators compared to the European countries.

The results can also be interpreted against the background of the governments' policies to support individual sectors in the almost two-year period, in the policy adopted by the BNB for managing loans and not classifying bad ones until the recovery period has passed, as well as the alternating periods of lock-downs and strong expansion after that, a result of the common psychology of Bulgarians as whole, and also due to the structure of the economy and the strong role of tourism (immediately after the first lockdown).

Left aside are factors that could not be measured due to lack of public information: the structure of the credit portfolio by sectors of the economy; the data on prolonged loans (also by sector); companies' indebtedness (also by sector). A broader interpretation of the impact of possible determinants on leading bank performance indicators in the two-year period since the beginning of Covid-19 could be given based on them.

Beyond the scope of this analysis is the situation in Ukraine, the energy crisis, and the new uncertainty, with a projection of an expected recession by November 2022. Since mid-2022 the governments have abandoned the support policies in relation to the pandemic, and the new

orientations are in a completely different direction – their effect will possibly be tracked in a continuation of the analysis in a subsequent period, after the health crisis.

In conclusion, the Bulgarian banking system is recovering quickly from the pandemic, the effects are not strong and long-lasting; they rather rise from the trend from before – the failure to restore the previous, pre-crisis, levels. The data shows higher profitability, better operational efficiency, and short-term volatility in lending.

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