CAMEL Evaluation of the Banks in Bulgaria

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Abstract

The financial stability of banks and the overall banking system is among the most important and at the same time most vulnerable to turmoil sectors of any economy. This is why the object of this study are commercial banks and an assessment of the effects of the restructuring and consolidation of commercial banks in Bulgaria using the CAMEL approach. The aim of the present study is to identify the effects of the restructuring and consolidation of commercial banks in Bulgaria. The study is based on a framework of tools for monitoring the financial stability of the banks operating in Bulgaria and assessing their strengths and weaknesses, including key measures of their capital adequacy, asset quality, management, efficiency and liquidity. The results of the study reveal the main effects of the restructuring and consolidation of commercial banks in Bulgaria. The results of an Ex-post analysis of the financial position of banks and the banking system, which measures their capital adequacy, asset quality, management, efficiency and liquidity since Bulgaria's accession to the EU reveal a successful integration of European practices to encourage the competition among banks in the country. This ranks Bulgaria among the leading East European countries in terms of bank products development and efficiency of its financial system.

Introduction

The assessment of banks' performance is an important theoretical and practical problem that could be interpreted from different points of view. The status and the level of development of the banking sector, which is considered the backbone of each national economy, are among the key indicators for its financial development and the analysis of its structural units is a key factor for identifying the problems and challenges faced by the national economy (Zahariev, et al., 2020a). Structurally, the article comprises a short review of publications on this topic, a presentation of the theoretical concepts of the model, and a presentation of the results from the study.

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1. Literature Review

The banking sector is among the most important and at the same time most vulnerable to financial turmoil economic sectors of the economy. The financial stability of banks and the overall banking system of any country is important for depositors and customers as well as for shareholders, supervisors and all other stakeholders who seek financial stability.

In recent years, Bulgaria's banking system has markedly increased its financial capacity due to the development of its private sector and the increasing competition among banks, which consolidated the banking capital (Hristova-Balkanska, I., 2015). By 2020, eight of the 29 banks which operated in the country in 2007 had undergone processes of restructuring and consolidation and two of them (the Corporate Commercial Bank (Zahariev, et al., 2020b) and the NLB (West-East Bank) had discontinued their operations. After the global financial and economic crisis, the banks operating in the country stabilized and expanded their loan portfolios. However, confidence in the Bulgarian banking system suffered a severe blow in 2014, when two banks (the Corporate Commercial Bank and (Commercial Bank Victoria EAD, 2021)) were declared insolvent, which had an adverse impact on the financial stability of the sector. This showed the need for effective ways to monitor the banking processes and their impact on banking stability despite the claims of the Central bank that the case with the CCB banking group was isolated and unrelated to the functioning of the rest of the banking sector.

The performance of banks was in the focus of a number of scientific publications. (Golin, 2001) points out that the overall performance of a bank is assessed in terms of its gains and profitability. A bank should be able to maintain its solvency, to grow, to generate profits and avoid adverse events (Golin, 2001). The efficiency of Bulgarian banks has been investigated in detail on both regional and national level in a number of studies. A study of the banking sector in Southeast Europe conducted by Atanasoglu et al. investigates the profitability response of bank-specific determinants in the period 1998-2002. It shows that, with the exception of liquidity, all bank-specific determinants have significantly affected the bank's profitability in the expected way. The key findings show that the effect of bank concentration is positive, that there is no positive relationship between banking reform and profitability, and that the effects of macroeconomic determinants can be both positive an negative (Athanasoglou, Delis, & Staikouras, 2006), (Nenovsky, N; Chobanov, P.; Mihaylova-Borisova, G.; Koleva, D., 2008) analysed the efficiency of the Bulgarian banking sector and classified the banks into several groups depending on their size and ownership. Using traditional coefficient analyses and non-parametric data envelopment analysis (DEA) they proved the competitive advantage of larger banks over smaller banks as well as of international banks over banks that operate only in Bulgaria. Using the same method, Tochkov and Nenovski studied banking efficiency and the factors that affected it in the period 1999-2007 and proved the positive effect of Bulgaria's accession to the EU (Tochkov, K.; Nenovsky, N., 2009). „Tomova and Nenkova measured the changes in the performance of banks in Bulgaria, calculated their efficiency and classified them according to their capacity to generate profits" (Nenkova, P.; Tomova, M., 2003). „Mihaylova used a non-parametric data envelopment analysis (DEA) to measure the

efficiency of the banking system in Bulgaria in the period 2007-2014 and to determine the impact of the global financial and economic crisis and the debt crisis in the euro area on the efficiency of Bulgarian banks" (Mihaylova-Borisova, G., 2014). (Sarastov, Z.; Kazandjieva, I.; Ralinska, E., 2021) assessed banks using a methodology for detailed deterministic and stochastic modelling of banks from an external perspective. The results they obtained show significant deviations between the assessment score and the book value of the banks.

Banking practice and scientific literature pay significant attention to the CAMEL/S system as an important framework for the financial supervision and monitoring of banks. A number of researchers examined the banking systems of various countries in terms of their CAMEL and CAMELS ratings. This further emphasizes the need for a systemic survey of the banking sector. Roman and Sargu analysed the financial soundness of 15 commercial banks in Romania using the Camels Framework (Roman & Sargu, 2013). The results of their comparative analysis showed that all banks had good capitalization and were able to respond to potential losses. An additional merit of their findings is that they determine the strengths and weaknesses in each of the studied banks. Purohit and Bothra measured the financial condition of the two biggest banks in India using the CAMEL system (Purohit & Bothra, 2018). They compared the publicly disclosed information about one public bank (the State Bank of India) and one private bank (the ICICI Bank) for the period 2012-2013 and 2016-2017. Their study shows that, according to the index values, the ICICI Bank needs to improve its capital adequacy and asset quality, while the SBI needs to improve its management efficiency, earnings sufficiency and liquidity.

Rahman and Islam used the CAMELS approach to rank banks based on their performance. Seventeen private commercial banks that meet certain criteria were rated for the period 2010-2016 (Rahman & Islam, 2018). The results of the comparative analysis provide an equal basis for monitoring the banks in Bangladesh and ranks first the East Bank. Georgios and Elvis approbated the CAMELS approach as a system for assessment of the eight largest Balkan banks (Georgios & Elvis, 2019). Their analysis confirms that the CAMELS rating model plays a key role in the bank supervision process. (Das & Nayak, 2020) used the CAMEL approach to measure the financial performance of public and private banks in Odisha, India. (Nguyen, 2021) identified the key performance factors for the Vietnamese commercial banks from 2009 to 2020 taking the CAMELS model as a framework for assessing and measuring their performance. Moreover, applying the quantitative regression method System Generalised Method of Moments (SGMM) to the results from previous research, the author studies ten statistically significant factors, including all components of the CAMELS approach. The obtained results highlight the relationship between the type of ownership and the performance of the banks and suggest that state-owned banks should improve their stability. (AL-Najjar, D.; Assous, H.F., 2021) studied the CAMEL assessment approach the most popular and accurate bank rating system. The authors assessed the performance of the eleven Saudi banks listed in the Saudi stock exchange all-share index (TASI) and ranked them according to their CAMEL composite and CAMEL overall ratings in order to study its effect on the

deposit accounts held with those banks in the period 2014-2018. The obtained results show that their equity measured in terms of CAR, management in terms of effectiveness ratio, ROE and liquidity in terms of loans-to-deposits ratio have a positive effect on the volume of deposits held with those banks. At the same time, their profitability in terms of net income from interest to net earnings and liquidity calculated from CASA had a negative effect on the volume of bank deposits. Last, the asset quality ratio and remaining ratios did not have any significant effect on the volume of bank deposits. (Ali, M. R.; Ratul, M. R.; Tisha, R. T.; Islam, M. A., 2021) applied the CAMEL model to determine the strengths and weaknesses of the banks in Bangladesh in the period 2014-2017. They rated the banks on a qualitative scale into categories such as "satisfactory", "unsatisfactory", "fair", "marginally low", etc. for each group of measures of the CAMEL framework.

The main conclusion from this literature review is that banks with lower ratings need to take action to improve their performance. All studies show the importance of analysing the CAMEL parameters and the importance of studying the „capital adequacy", „asset quality", „management efficiency" and „liquidity" of banks. The complex analysis and correct interpretation of the results can help prevent banking cataclysms and reveal the effects of bank restructuring and consolidation within a national banking system.

2. Methodology

There are several systems for monitoring the banking efficiency. The performance of banks is affected by a number of factors - both endogenous (factors that are specific for each bank) and exogenous, such as the variables of the macroeconomic environment.

This study focuses on assessing the influence of endogenous factors. The main analytical tools used to assess bank performance are the traditional financial ratio analysis, complex non-parametric methods (Sakouvogui, 2020) such as Data Envelopment Analysis (DEA), parametric methods such as Stochastic Frontier Analysis (SFA), and CAMEL/S.

The CAMEL approach is one of the key tools for monitoring the financial stability of banks and assessing their strengths and weaknesses. It is based on the Federal Financial Institutions Examination Council's (FFIEC, 2021) Uniform Financial Institution Rating System (UFIRS, 2021), (National Credit Union Administration (NCUA), 2007). The composite rating is commonly referred to as CAMEL (Dimitrova, 1998), which is abbreviated from the component ratings for "capital adequacy" (C), "asset quality" (A), "management capabilities" (M), "earnings sufficiency" (E), and "liquidity position" (L). In 1979, FFIEC developed the UFIRS for a the system-wide risk assessment, and the National Credit Union Administration (NCUA) adopted and initiated the implementation of CAMEL in October 1987. In 1997 (Gasbarro, Sadguna, & Zumwalt, 2002), a sixth component (S for sensitivity to market risk) was added and thus CAMEL was modified into CAMELS. In this study the sensitivity to market risk (S) was not taken into account as there are a number of risk factors – as systematic, macroprudential, etc. (Zahariev, Radulova, Aleksandrova, & Petrova, 2021) – the numerical measurement of which would impair the reliability of the final results. Currently, the CAMEL approach is widely used by credit and rating agencies for credit analysis as well as for assessing the creditworthiness of banks. It is a significant tool which describes the relative financial strength of a bank (Purohit & Bothra, 2018)

and comprises a comprehensive set of measures for monitoring and control of its weaknesses. At the same time, it can be used to compare the overall performance of banks as well as their main individual performance parameters. Thus it can be used to track and present the effects of ongoing restructuring and consolidation among the banks within a national banking system. The system is provided for by many regulations of the European Union and is applied by a number of developed countries. The CAMEL approach is also used to evaluate the publicly traded shares of commercial banks. (Golin, 2001) The relationship between CD rates as a measure of banking risk and the confidential CAMEL scores assigned to a bank as a result of an onsite examination were also investigated (Cargill, 1989).

This study is based on a quantitative assessment of twelve indicators with analytical value for the CAMEL framework. These indicators are summarized in Table 1 below.

Table 1: *CAMEL components and measures*

CAMEL component	Measure
Capital adequacy (C)	Equity/Total assets
Asset quality (A)	Financial assets/total assets Loans and advances/ total assets
Management capability (M)	Interest/deposit payables Loans/deposits Profit/total profit for the sector
Earnings (E)	Return on equity (ROE) Return on assets (ROA) Interest income/total assets
Liquidity (L)	Liquid assets/total assets Government securities /assets Liquid assets/deposits

Source: *Author's adaptation*

Each group of CAMEL parameters and the related indicators are indicative for the financial condition of each individual bank and the overall banking system. The equity to total assets ratio is essential for assessing the capital adequacy and an important indicator of the stability of banks. Capital adequacy can be measured through various significant ratios, such as total equity to total assets, equity to net loans, or equity to liabilities. The total equity to total assets ratio measures solvency and is one of the most measures based on information which is obtained directly from the bank's balance sheet and which shows in detail its general position.

The asset quality of banking institutions is most often determined by the quality of loans as a significant item in the bank's balance sheet. One of the most commonly used measures is the non-performing loans to total loans ratio. Another important indicator is the ratio of total loans, receivables and financial assets to total assets as the most important components in the structure of assets (Roman & Sargu, 2013), which represent the relationship between loss-sensitive assets and total assets. The financial assets and loans and receivables to

total assets are the indicators that are included in the analytical process for assessing asset quality. Their increase (Varga, Bánkuti, & Kovács-Szamos, 2020) would increase the bank's risk exposure. The management capability of a bank affects its growth and development. The indicators included in this composite group measure the ability of the bank to generate profits through conversion of its assets. Although the loans-to-deposits ratio is often used to determine whether a bank has reliable sources of financing and to measure its liquidity, in this case, the ratio is assigned to the group for assessing the quality of the bank's management as it also indicates what share of the loan portfolio consists of deposits, which are supposed to be a stable source of financing and are attracted as a result of management decisions. The profit/total profit for the sector indicator represents the bank's ability to generate income from its operations and can provide information on the bank's position in the banking system.

The indicators that measure the earnings sufficiency of the banks are the return on equity (ROE), the return on assets (ROA) and the ratio of interest income to total assets. All three indicators have informational value in terms of return on investment and asset utilization. ROA shows how profitable the bank's assets are in generating revenue. ROE measures the return on the equity of the bank. The values of this indicator (Evan & al., 2000) should be interpreted with caution, as a high level can mean high profitability but also a low level of capitalization, while a low level can mean a low level of profitability and high capitalization of the bank. The third indicator, the ratio of interest income to total assets, is used as a measure of the ratio of one of the largest sources of income of the bank to its total assets.

Liquidity is a key indicator for all banks as its shows their ability to meet their financial obligations. This group of measures includes the following ratios: liquid assets to total assets; government securities to assets; liquid assets to deposits. Different researchers use different financial ratios to measure bank liquidity. (Khalaf, A., 2012) uses the liquid assets to total assets ratio to measure of the overall liquidity of banks. The government securities to total assets ratio measures the risk associated with the assets held with the bank. Banks invest in government securities because they are considered safe sources of return. The liquid assets to total deposits ratio measures the liquidity needed to cover the bank deposits.

The above measures constitute a formal framework for the indicators used in this study. The measures can be adapted and changed according to the author's views and the condition of the banking institutions in the system.

The analysis is based on the accumulation of data from the publicly available statements of financial position, balance sheets and income statements of the banks disclosed by the Central Bank of Bulgaria – the Bulgarian National Bank (BNB). For optimality in presenting the final results of the analysis of banks in the Bulgarian banking system, an author's codification is applied, according to the names of the banks on the BNB list, which are reflected in the tables classifying the rank (Tables 2 to 7), as follows: Investbank AD – InvB AD; Municipal Bank AD – MB AD; ING Wholesale Banking, Sofia Branch – INGBank; First Investment Bank AD – FirstIB AD; Raiffeisenbank (Bulgaria) EAD – RB (BG) EAD; Bulgarian American Credit Bank AD – BACBank AD; Piraeus Bank Bulgaria AD – PirBankBG AD; United Bulgarian Bank

AD – UBGBank AD; ProCredit Bank (Bulgaria) EAD – ProCrBBG EAD; Commerce Bank D AD – CBD AD; Citybank Europe AD, Bulgaria branch – CBEurope BG AD; Tokuda Bank AD – Tbank AD; DSK Bank AD – DSKB AD; TBI Bank EAD – TBIB EAD; T.C. Ziraat Bankasi - Sofia branch – TCZB Sf.; Isbank AG – Sofia branch – ISB AG Sf.; Societe Generale Expressbank AD – SGExpB; BNP Paribas S.A. – Sofia branch – BNPP Sf.; International Asset Bank AD – InterAB AD; Commercial Bank Victoria EAD – CBVictoria EAD; Texim Bank AD – TexB AD; Alianz Bank Bulgaria AD – ALZB BG AD; Bulgarian Development Bank AD – BgDevB AD; UniCredit Bulbank AD – UCBB AD; Central Cooperative Bank AD – CCBank AD; CIBANK EAD – CB EAD; Alpha Bank – Bulgaria branch – AlphaB Bg; Eurobank Bulgaria AD – EuroB BG AD; Varengold Bank AG, Sofia Branch – VarB. AG, BNP Paribas Personal Finance S.A. - Bulgaria branch – BNPPFSA BG.

The results are based on calculations of the above ratios and ranking of each bank according to these ratios. After calculating the rank of each individual indicator, the results of the five separate groups of parameters are systematized according to the CAMEL approach. The overall rank is calculated according to the number of banks operating in the country in each period, i.e. from R1 to R28 in 2014, from R1 to R27 in 2017 and from R1 to R24 in 2020 and is based on the value of the indicators and their annualization for the period 2014-2020. The analysed years are chosen because in these the Bulgarian banking system underwent processes of restructuring and consolidation. Respectively, 28th, 27th, and 24th are the lowest possible ranks and are indicative of insufficient compliance with the criteria and require additional analysis and monitoring of these indicators by the bank management. The top-ranking banks have the best performance. For the purposes of the comparative analysis and in order to draw significant analytical conclusions, the analysis includes the annual data for 2014, which was marked by a destabilization of the Bulgarian banking system due a peculiar stress test caused by the bankruptcy of one of the leading banks – the Corporate Commercial Bank (Trifonova & Kaneva, 2016). The next year included in the analysis is 2017 as it marks the stabilization of the banking system and the undertaking of a number of actions for the restructuring of leading banks in the country, which was accomplished by 2020. The final CAMEL ranking is based on the average cumulative assessment of the five groups of indicators. Based on the results of the analysis, the banks of the Bulgarian banking system are regrouped according to their financial stability in relation to the framework and the strengths and weaknesses of each bank are determined.

3. Results

The CAMEL rankings of the banks operating in Bulgaria are shown in several tables, in which they are ranked in terms of their „capital adequacy", „asset quality", „management capability", „earnings sufficiency", „liquidity" and overall performance in 2014, 2017 and 2020. In order to determine the differences between the actual and the hypothetical distribution based on the financial stability of the banks according to the CAMEL system, the final table shows a comparison of their overall CAMEL ranking in and their ranking according to the Bulgarian National Bank (BNB, Registri za kreditnite institucii, 2021) for 2020.

The ranking of the banks in terms of their capital adequacy is shown in Table 2 below.

Table 2: *Ranking of banks according to their capital adequacy in 2014, 2017, and 2020*

2014	Rank	2017	Rank	2020	Rank
InvB AD	R18	InvB AD	R19	InvB AD	R9
MB AD	R23	MB AD	R23	MB AD	R19
INGBank	R26	INGBank	R25	INGBank	R22
FirstIB AD	R21	FirstIB AD	R1	FirstIB AD	R11
RB(BG) EAD	R8	RB(BG) EAD	R12	RB(BG) EAD	R14
BACBank AD	R4	BACBank AD	R9	BACBank AD	R10
PirBankBG AD	R5	PirBankBG AD	R14	UBGBank AD	R8
UBGBank AD	R6	UBGBank AD	R11	ProCrBBG EAD	R13
ProCrBBG EAD	R13	ProCrBBG EAD	R17	CBD AD	R7
CBD AD	R12	CBD AD	R10	CBEurope BG	R21
CBEurope BG	R25	CBEurope BG	R24	Tbank AD	R12
Tbank AD	R15	Tbank AD	R16	BNPPFSA BG	R20
DSKB AD	R7	DSKB AD	R13	DSKB AD	R4
TBIB EAD	R10	TBIB EAD	R5	TBIB EAD	R2
TCZB Sf.	R1	TCZB Sf.	R3	TCZB Sf.	R3
ISB AG Sf.	R27	ISB AG Sf.	R27	BNPP Sf.	R23
SGExpB AD	R14	SGExpB AD	R15	InterAB AD	R17
BNPP Sf.	R24	BNPP Sf.	R26	TexB AD	R16
InterAB AD	R22	InterAB AD	R22	ALZB BG AD	R18
CBVictoria EAD	R16	CBVictoria EAD	R4	BGDevB AD	R1
TexB AD	R3	TexB AD	R7	UCBB AD	R6
ALZB BG AD	R19	ALZB BG AD	R21	CCBank AD	R15
BGDevB AD	R2	BGDevB AD	R2	VarB AG Sf.	R24
UCBB AD	R9	UCBB AD	R8	EuroB BG AD	R5
CCBank AD	R20	CCBank AD	R20		
CB EAD	R17	CB EAD	R18		
AlphaB BG	R28	EuroB BG AD	R6		
EuroB BG AD	R11				

Source: *Authors' calculations based on BNB data*

In 2014, the top-ranking banks in terms of capital adequacy were the T.C. Ziraat Bankasi - Sofia branch, the Bulgarian Development Bank, Texim Bank, the Bulgarian American Credit Bank, and Piraeus Bank Bulgaria. In 2017, these were First Investment Bank AD, the Bulgarian Development Bank AD, the T.C. Ziraat Bankasi - Sofia branch, Commercial Bank Victoria EAD, and TBI Bank EAD.

In 2020, the top ranks were held by the Bulgarian Development Bank AD, TBI Bank EAD, the T.C. Ziraat Bankasi - Sofia branch, DSK Bank AD, and Eurobank Bulgaria AD.

In terms of asset quality (Table 3), the top ranks in 2014 were held by Piraeus Bank Bulgaria, Eurobank Bulgaria, BNP Paribas S.A. – Sofia branch, DSK Bank, and Alpha Bank – Bulgaria branch. Piraeus

Bank Bulgaria ranked first in terms of both underlying ratios. An identical situation is observed for 2017, when Eurobank Bulgaria AD ranked first and was followed by CIBANK EAD, ProCredit Bank (Bulgaria) EAD, BNP Paribas S.A. - Sofia branch, and DSK Bank AD. A significant change in the ratings is observed for 2020, when BNP Paribas Personal Finance S.A. - Bulgaria branch ranked first in terms of asset quality and was followed by ProCredit Bank (Bulgaria) EAD, Raiffeisenbank (Bulgaria) EAD, DSK Bank AD, and Eurobank Bulgaria AD.

Table 3: *Ranking of banks according to their asset quality in 2014, 2017, and 2020*

2014	Rank	2017	Rank	2020	Rank
InvB AD	R26	InvB AD	R23	InvB AD	R20
MB AD	R28	MB AD	R24	MB AD	R22
INGBank	R16	INGBank	R18	INGBank	R16.5
FirstIB AD	R11	FirstIB AD	R12	FirstIB AD	R10
RB(BG) EAD	R14	RB(BG) EAD	R10	RB(BG) EAD	R3
BACBank AD	R15	BACBank AD	R8	BACBank AD	R6
PirBankBG AD	R1	PirBankBG AD	R11	UBGBank AD	R7
UBGBank AD	R9	UBGBank AD	R13	ProCrBBG EAD	R2
ProCrBBG EAD	R6	ProCrBBG EAD	R3	CBD AD	R18.5
CBD AD	R25	CBD AD	R19	CBEurope BG	R23
CBEurope BG	R13	CBEurope BG	R26	Tbank AD	R8
Tbank AD	R24	Tbank AD	R17	BNPPFSA BG	R1
DSKB AD	R4	DSKB AD	R5	DSKB AD	R4
TBIB EAD	R7	TBIB EAD	R7	TBIB EAD	R11
TCZB Sf.	R21	TCZB Sf.	R16	TCZB Sf.	R12.5
ISB AG Sf.	R23	ISB AG Sf.	R27	BNPP Sf.	R14
SGExpB AD	R12	SGExpB AD	R6	InterAB AD	R21
BNPP Sf.	R3	BNPP Sf.	R4	TexB AD	R18.5
InterAB AD	R18	InterAB AD	R15	ALZB BG AD	R12.5
CBVictoria EAD	R17	CBVictoria EAD	R25	BGDevB AD	R9
TexB AD	R27	TexB AD	R20	UCBB AD	R15
ALZB BG AD	R19	ALZB BG AD	R22	CCBank AD	R16.5
BGDevB AD	R20	BGDevB AD	R9	VarB AG Sf.	R24
UCBB AD	R8	UCBB AD	R14	EuroB BG AD	R5
CCBank AD	R22	CCBank AD	R21		
CB EAD	R10	CB EAD	R2		
AlphaB BG	R5	EuroB BG AD	R1		
EuroB BG AD	R2				

Source: *Authors' calculations based on BNB data*

In terms of management capabilities (Table 4), the top-ranking banks were:

a) in 2014, the top rank was held by United Bulgarian Bank, followed by TBI Bank, DSK Bank, First Investment Bank, and Eurobank Bulgaria. The top ranking banks in terms of the individual ratios (i.e. interest/deposit payables, loans/deposits, profit/total profit for the sector) were Investbank, Piraeus Bank Bulgaria and UniCredit Bulbank.

b) In 2017: TBI Bank EAD, First Investment Bank AD, Societe Generale Expressbank AD, Eurobank Bulgaria AD, Bulgarian Development Bank AD, and Bulgarian American Credit Bank AD. The top ranking banks in terms of the individual measures were: in terms of interest/ deposit payables – ISBANK AG – Sofia branch, in terms of loans to deposits ratio – Commercial Bank Victoria EAD, in terms of profit to total profit for the sector – UniCredit Bulbank AD, which is one of the biggest banks in Bulgaria.

c) In 2020, the banks with the best management capabilities were DSK Bank AD, TBI Bank EAD, First Investment Bank AD, Raiffeisenbank (Bulgaria) EAD, and Bulgarian Development Bank AD. The top ranks in terms of the underlying ratios were TBI Bank EAD in terms of interest/deposit payables, the Bulgarian Development Bank AD in terms of loans to deposits ratio, and UniCredit Bulbank AD in terms of profit to total profit for the sector.

Table 4: *Ranking of banks according to their management capabilities in 2014, 2017, and 2020*

2014	Rank	2017	Rank	2020	Rank
InvB AD	R16.5	InvB AD	20	InvB AD	21
MB AD	R23	MB AD	23.5	MB AD	13
INGBank	R26	INGBank	27	INGBank	19
FirstIB AD	R3.5	FirstIB AD	2	FirstIB AD	3
RB(BG) EAD	R10	RB(BG) EAD	R12.5	RB(BG) EAD	R4.5
BACBank AD	R10	BACBank AD	R5	BACBank AD	R7
PirBankBG AD	R6.5	PirBankBG AD	R7	UBGBank AD	R11
UBGBank AD	R1	UBGBank AD	R25	ProCrBBG EAD	R7
ProCrBBG EAD	R8	ProCrBBG EAD	R14	CBD AD	R14.5
CBD AD	R19	CBD AD	R15	CBEurope BG	R17
CBEurope BG	R22	CBEurope BG	R26	Tbank AD	R14.5
Tbank AD	R21	Tbank AD	R17.5	BNPPFSA BG	R23
DSKB AD	R3.5	DSKB AD	R8.5	DSKB AD	R1
TBIB EAD	R2	TBIB EAD	R1	TBIB EAD	R2
TCZB Sf.	R20	TCZB Sf.	R17.5	TCZB Sf.	R12
ISB AG Sf.	R27	ISB AG Sf.	R21	BNPP Sf.	R20
SGExpB AD	R10	SGExpB AD	R3	InterAB AD	R10
BNPP Sf.	R25	BNPP Sf.	R16	TexB AD	R17
InterAB AD	R16.5	InterAB AD	R8.5	ALZB BG AD	R22
CBVictoria EAD	R13.5	CBVictoria EAD	R10.5	BGDevB AD	R4.5

2014	Rank	2017	Rank	2020	Rank
TexB AD	R24	TexB AD	R23.5	UCBB AD	R9
ALZB BG AD	R13.5	ALZB BG AD	R22	CCBank AD	R17
BGDevB AD	R13.5	BGDevB AD	R5	VarB AG Sf.	R24
UCBB AD	R6.5	UCBB AD	R10.5	EuroB BG AD	R7
CCBank AD	R18	CCBank AD	R12.5		
CB EAD	R13.5	CB EAD	R19		
AlphaB BG	R28	EuroB BG AD	R5		
EuroB BG AD	R5				

Source: Authors' calculations based on BNB data

According to the measures of their earnings sufficiency, i.e. ROE, ROA, and interest income to total assets ratio, the top ranks were held as follows:

a) In 2014 - TBI Bank, DSK Bank, ProCredit Bank (Bulgaria), United Bulgarian Bank, and Alianz Bank Bulgaria.
b) In 2017 - DSK Bank AD, TBI Bank EAD, Eurobank Bulgaria AD, ProCredit Bank (Bulgaria) EAD, and Raiffeisenbank (Bulgaria) EAD.
c) In 2020 - BNP Paribas Personal Finance S.A. - Bulgaria branch, Eurobank Bulgaria AD, TBI Bank EAD, ProCredit Bank (Bulgaria) EAD, and DSK Bank AD. An interesting fact is that the top-ranking banks in terms of the underlying ratios in 2020 were Bulgarian branches of foreign banks. In terms of ROE the top rank was held by ING Wholesale Banking, Sofia Branch, in ROA - BNP Paribas Personal Finance S.A. - Bulgaria branch, and in the interest income to total assets ratio- TBI Bank EAD.

Table 5: *Ranking of banks according to their earnings sufficiency in 2014, 2017, and 2020*

2014	Rank	2017	Rank	2020	Rank
InvB AD	R23.5	InvB AD	R26	InvB AD	R23
MB AD	R13	MB AD	R24	MB AD	R15
INGBank	R14	INGBank	R19	INGBank	R9.5
FirstIB AD	R8	FirstIB AD	R10	FirstIB AD	R14
RB(BG) EAD	R7	RB(BG) EAD	R5	RB(BG) EAD	R12
BACBank AD	R25	BACBank AD	R14.5	BACBank AD	R9.5
PirBankBG AD	R21	PirBankBG AD	R25	UBGBank AD	R6
UBGBank AD	R4.5	UBGBank AD	R23	ProCrBBG EAD	R4
ProCrBBG EAD	R3	ProCrBBG EAD	R4	CBD AD	R9.5
CBD AD	R17.5	CBD AD	R8	CBEurope BG	R13
CBEurope BG	R11	CBEurope BG	R16	Tbank AD	R19.5
Tbank AD	R26	Tbank AD	R13	BNPPFSA BG	R1
DSKB AD	R2	DSKB AD	R2	DSKB AD	R5
TBIB EAD	R1	TBIB EAD	R1	TBIB EAD	R3

2014	Rank	2017	Rank	2020	Rank
TCZB Sf.	R23.5	TCZB Sf.	R17	TCZB Sf.	R22
ISB AG Sf.	R19	ISB AG Sf.	R7	BNPP Sf.	R17
SGExpB AD	R9	SGExpB AD	R6	InterAB AD	R7
BNPP Sf.	R28	BNPP Sf.	R21	TexB AD	R21
InterAB AD	R15	InterAB AD	R19	ALZB BG AD	R17
CBVictoria EAD	R22	CBVictoria EAD	R27	BGDevB AD	R24
TexB AD	R17.5	TexB AD	R19	UCBB AD	R9.5
ALZB BG AD	R4.5	ALZB BG AD	R9	CCBank AD	R17
BGDevB AD	R16	BGDevB AD	R22	VarB AG Sf.	R19.5
UCBB AD	R6	UCBB AD	R11	EuroB BG AD	R2
CCBank AD	R20	CCBank AD	R14.5		
CB EAD	R10	CB EAD	R12		
AlphaB BG	R27	EuroB BG AD	R3		
EuroB BG AD	R12				

Source: Authors' calculations based on BNB data

According to the measures of their liquidity, i.e. their liquid assets to total assets, government securities to assets, and liquid assets to deposits ratios, the top ranks were held by the following banks:

a) In 2014 - Isbank AG - Sofia branch, Central Cooperative Bank, TBI Bank, Bulgarian Development Bank, and Societe Generale Expressbank.

b) In 2017 - CIBANK EAD, Investbank AD, DSK Bank AD, Municipal Bank AD, and Eurobank Bulgaria AD.

c) In 2020 - United Bulgarian Bank AD, Raiffeisenbank (Bulgaria) EAD, Tokuda Bank AD, Investbank AD, and TBI Bank EAD. The top-ranking bank in terms liquid assets to total assets in 2020 was BNP Paribas Personal Finance S.A. - Bulgaria branch; in terms of government securities to assets – the United Bulgarian Bank AD, and in terms liquid assets to deposits ratio - BNP Paribas Personal Finance S.A. - Bulgaria branch.

Table 6: Ranking of banks according to their liquidity in 2014, 2017, and 2020

2014	Rank	2017	Rank	2020	Rank
InvB AD	R18	InvB AD	R1.5	InvB AD	R4
MB AD	R11	MB AD	R3.5	MB AD	R20
INGBank	R27	INGBank	R17	INGBank	R12
FirstIB AD	R15.5	FirstIB AD	R8	FirstIB AD	R15
RB(BG) EAD	R14	RB(BG) EAD	R10.5	RB(BG) EAD	R2
BACBank AD	R13	BACBank AD	R12	BACBank AD	R18
PirBankBG AD	R21	PirBankBG AD	R21.5	UBGBank AD	R1
UBGBank AD	R24	UBGBank AD	R9	ProCrBBG EAD	R19

2014	Rank	2017	Rank	2020	Rank
ProCrBBG EAD	R9	ProCrBBG EAD	R18	CBD AD	R11
CBD AD	R25.5	CBD AD	R15.5	CBEurope BG	R24
CBEurope BG	R22	CBEurope BG	R24	Tbank AD	R3
Tbank AD	R6	Tbank AD	R6	BNPPFSA BG	R7
DSKB AD	R20	DSKB AD	R3.5	DSKB AD	R9
TBIB EAD	R3	TBIB EAD	R21.5	TBIB EAD	R5
TCZB Sf.	R17	TCZB Sf.	R25	TCZB Sf.	R21
ISB AG Sf.	R1	ISB AG Sf.	R19	BNPP Sf.	R23
SGExpB AD	R5	SGExpB AD	R7	InterAB AD	R22
BNPP Sf.	R11	BNPP Sf.	R23	TexB AD	R9
InterAB AD	R8	InterAB AD	R26	ALZB BG AD	R13.5
CBVictoria EAD	R7	CBVictoria EAD	R27	BGDevB AD	R6
TexB AD	R15.5	TexB AD	R13	UCBB AD	R17
ALZB BG AD	R11	ALZB BG AD	R14	CCBank AD	R16
BGDevB AD	R4	BGDevB AD	R15.5	VarB AG Sf.	R13.5
UCBB AD	R23	UCBB AD	R10.5	EuroB BG AD	R9
CCBank AD	R2	CCBank AD	R20		
CB EAD	R25.5	CB EAD	R1.5		
AlphaB BG	R28	EuroB BG AD	R5		
EuroB BG AD	R19				

Source: Authors' calculations based on BNB data

The overall ranking of Bulgarian banks based on the complex assessment of the CAMEL framework (Table 7) shows that in 2014 DSK Bank, United Bulgarian Bank, UniCredit Bulbank, TBI Bank and Eurobank Bulgaria were the banks with the best ranks in terms of the five groups of indicators. Two years later, there was a shift in the overall rating of the banks and Eurobank Bulgaria AD ranked first and was followed by DSK Bank AD, TBI Bank EAD, Societe Generale Expressbank AD and First Investment Bank AD. In 2020, the top-ranking Bulgarian bank according to the CAMEL model was DSK Bank AD, followed by TBI Bank EAD, Eurobank Bulgaria AD, while United Bulgarian Bank AD and Raiffeisenbank (Bulgaria) EAD share the fourth position.

Table 7: Overall CAMEL rating of commercial banks operating in Bulgaria in 2014, 2017, and 2020

2014	Rank	2017	Rank	2020	Rank
InvB AD	R23	InvB AD	R14	InvB AD	R15
MB AD	R25	MB AD	R23	MB AD	R21
INGBank	R15	INGBank	R25	INGBank	R14
FirstIB AD	R9	FirstIB AD	R5	FirstIB AD	R8

2014	Rank	2017	Rank	2020	Rank
RB(BG) EAD	R10	RB(BG) EAD	R7	RB(BG) EAD	R4.5
BACBank AD	R16	BACBank AD	R8	BACBank AD	R10
PirBankBG AD	R7	PirBankBG AD	R15.5	UBGBank AD	R4.5
UBGBank AD	R2	UBGBank AD	R15.5	ProCrBBG EAD	R7
ProCrBBG EAD	R6	ProCrBBG EAD	R9	CBD AD	R13
CBD AD	R17	CBD AD	R12	CBEurope BG	R22.5
CBEurope BG	R12	CBEurope BG	R27	Tbank AD	R11
Tbank AD	R27	Tbank AD	R13	BNPPFSA BG	R6
DSKB AD	R1	DSKB AD	R2	DSKB AD	R1
TBIB EAD	R4	TBIB EAD	R3	TBIB EAD	R2
TCZB Sf.	R19	TCZB Sf.	R20	TCZB Sf.	R20
ISB AG Sf.	R28	ISB AG Sf.	R24	BNPP Sf.	R22.5
SGExpB AD	R11	SGExpB AD	R4	InterAB AD	R18.5
BNPP Sf.	R24	BNPP Sf.	R18	TexB AD	R16
InterAB AD	R21	InterAB AD	R22	ALZB BG AD	R17
CBVictoria EAD	R20	CBVictoria EAD	R26	BGDevB AD	R9
TexB AD	R22	TexB AD	R17	UCBB AD	R12
ALZB BG AD	R13	ALZB BG AD	R19	CCBank AD	R18.5
BGDevB AD	R18	BGDevB AD	R11	VarB AG Sf.	R24
UCBB AD	R3	UCBB AD	R10	EuroB BG AD	R3
CCBank AD	R26	CCBank AD	R21		
CB EAD	R8	CB EAD	R6		
AlphaB BG	R14	EuroB BG AD	R1		
EuroB BG AD	R5				

Source: Authors' calculations based on BNB data

The banks with the lowest overall ranks in 2014 were Isbank AG - Sofia branch, Tokuda Bank, Central Cooperative Bank, Municipal Bank, BNP Paribas S.A. – Sofia branch. In 2017, the lowest ranks were held by Citybank Europe AD, Bulgaria branch, Commercial Bank Victoria EAD, ING Wholesale Banking, Sofia Branch, Isbank AG - Sofia branch, and Municipal Bank AD. In 2020, the lowest overall CAMEL rank was calculated for the newest bank on the market in Bulgaria - Varengold Bank AG, Sofia Branch, preceded by BNP Paribas S.A. – Sofia branch and Citybank Europe AD, Bulgaria branch, Municipal Bank AD and T.C. Ziraat Bankasi - Sofia branch. All these banks are branches of foreign banks and are therefore less popular among the local customers while they are developing their products on the market in Bulgaria. The only exception is Municipal Bank AD (Municipal Bank JSC, 2021) with 95,50% of its shares owned by Novito Opportunities Fund AGmvKd, 3.22% by municipal companies and private companies and 1.28% by sixteen Bulgarian municipalities. This is why it provides banking services to many municipal companies and

administrations, as a know-how market allocation for Bulgaria and Eastern Europe (Sabitova, Shavaleyeva, Lizunova, Khairullova, & Zahariev, 2020b).

The CAMEL ranking of the banks operating in Bulgaria is compared to the ranking of the Bulgarian National Bank for 2020 according to the register of licensed banks and branches of foreign banks in the Republic of Bulgaria (BNB, Registri za kreditnite institucii, 2021) and the distribution of banks by groups as of December 2020 (BNB, Danni za bankovata sistema i za bankite po grupi* (v hiliadi levove), 31.12.2020, 2021) (BNB, Data on the Banking System and on Banks by Groups * (in thousands of BGN), 31.12.2020, 2021) in Table 8 below. According to the BNB ranking, the banks are classified into three separate groups (BNB, Danni za bankovata sistema i za bankite po grupi* (v hiliadi levove), 31.12.2020, 2021) according to the size of their assets at the end of the reporting period. „The first group consists of the 5 banks with the largest volume of assets in each reporting period, the second group includes the other Bulgarian banks and the third group includes the branches of foreign banks in Bulgaria." According to the CAMEL classification, the banks are also classified into three groups, but here the first group includes the five most stable banks, the second includes those with a rank lower than the average for the sample (12.5), and the third includes the rest.

Table 8: Comparison of the CAMEL ranking and the BNB ranking of banks operating in Bulgaria in 2020

CAMEL 2020		BNB 2020	
Rank	Group 1	Rank	Group 1
R1	DSK Bank AD	R1	UniCredit Bulbank AD
R2	TBI Bank EAD	R2	DSK Bank AD
R3	Eurobank Bulgaria AD	R3	United Bulgarian Bank AD
R4.5	Raiffeisenbank (Bulgaria) EAD	R4	Eurobank Bulgaria AD
R4.5	United Bulgarian Bank AD	R5	First Investment Bank AD
CAMEL 2020		BNB 2020	
Rank	Group 2	Rank	Group 2
R6	BNP Paribas Personal Finance S.A. - Bulgaria branch	R6	Raiffeisenbank (Bulgaria) EAD
R7	ProCredit Bank (Bulgaria) EAD	R7	Central Cooperative Bank AD
R8	First Investment Bank AD	R8	Bulgarian Development Bank AD
R9	Bulgarian Development Bank AD	R9	Alianz Bank Bulgaria AD
R10	Bulgarian American Credit Bank AD	R10	ProCredit Bank (Bulgaria) EAD
R11	Tokuda Bank AD	R11	Investbank
R12	UniCredit Bulbank AD	R12	Municipal Bank AD
		R13	Bulgarian American Credit Bank AD
		R14	International Asset Bank AD
		R15	Commerce Bank D AD

CAMEL 2020		BNB 2020	
		R16	TBI Bank EAD
		R17	Teksim Bank AD
		R18	Tokuda Bank AD
Rank	Group 3	Rank	Group 3
R13	Commerce Bank D AD	R19	Citybank Europe, Bulgaria branch
R14	ING Wholesale Banking, Sofia Branch	R20	ING Wholesale Banking, Sofia Branch
R15	Investbank AD	R21	BNP Paribas S.A. – Sofia branch
R16	Teksim Bank AD	R22	BNP Paribas Personal Finance S.A. - Bulgaria branch
R17	Alianz Bank Bulgaria AD	R23	T.C. Ziraat Bankasi - Sofia branch
R18.5	International Asset Bank AD	R24	Varengold Bank AG, Sofia Branch
R18.5	Central Cooperative Bank AD		
R20	T.C. Ziraat Bankasi - Sofia branch		
R21	Municipal Bank AD		
R22.5	BNP Paribas S.A. – Sofia branch		
R22.5	Citybank Europe AD, Bulgaria branch		
R24	Varengold Bank AG, Sofia Branch		

Source: Authors' adaptation of own calculations based on BNB data

The parallel distribution of banks in relation to the financial stability indicators in the CAMEL system for 2020 shows that:

- twelve of the twenty-four banks licensed to operate in Bulgaria retain their positions in the three groups defined by the BNB;
- a positive shift is observed for Raiffeisenbank (Bulgaria) EAD and TBI Bank EAD, which, despite the smaller volume of their capital, rank among the financially stable banks operating in the country. As a branch of a foreign bank in Bulgaria, BNP Paribas Personal Finance SA - branch Bulgaria also has a satisfactory performance in terms of the indicators of the CAMEL system and is positioned in the second group;
- a negative shift to a lower group is observed for First Investment Bank AD

and UniCredit Bulbank AD, which are leaders on the banking market in Bulgaria. A similar shift is observed for Commerce Bank D, Investbank AD, Texim Bank AD, Alianz Bank Bulgaria, International Asset Bank AD, Central Cooperative Bank AD and Municipal Bank AD, which rank among the banks with weaker financial stability. This means that their operations should be monitored more adequately to improve their financial performance in terms of capital adequacy, asset quality, liquidity, management and efficiency;

As a result of the restructuring and consolidation processes at the end of the analyzed period, BNP Paribas Personal Finance SA - Bulgaria Branch is the best bank in terms of asset quality. The best managed banks are: DSK Bank AD, TBI Bank EAD, First Investment Bank AD, Raiffeisenbank

(Bulgaria) EAD, Bulgarian development bank AD. In 2020, the most efficient banks in terms of the three indicators were branches of foreign banks in the country. According to the liquidity criteria, the best performing bank is United Bulgarian Bank AD.

Conclusion

Restructuring, consolidation and competition have significant effects on the Bulgarian banking system. Therefore, such decisions must be considered carefully when they aim to improve the risk profile of the banks to develop further and expand the capacity of the banking system.

The application of quantitative analytical techniques based on the parameters of the CAMEL framework is essential for measuring the financial condition of banks and banking systems in terms of their capital adequacy, asset quality, management, earnings sufficiency and liquidity. The ex-post analysis of the development of banks in Bulgaria during the period of its EU membership corroborated the successful integration of European practices which promote competition among the banks operating in the country. This ranks Bulgaria among the leading East-European countries in terms of banking products diversity and efficiency of its financial system.

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