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Profitability and Efficiency of the Bulgarian Banks –
Large, Medium-Sized and Small Banks

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Abstract. The paper analyses different indicators ROA, ROE, net interest margin, net noninterest margin /fees and commissions/, deposit growth, credit growth, as well as the ratios Loans-to-Deposits, Own Capital-to-Assets and the main components of the asset side of the balance sheet as loans, financial instruments and monetary funds for the large and medium-sized and small banks in Bulgaria. These indicators are analyzed individually for each bank but conclusions are drawn on the group level – large banks and medium-sized and smaller banks. The analysis show that the bigger banks have higher ROA and ROE for the analyzed period compared with the medium-sized and small banks. The paper investigates the factors for the weak correlation between GDP as well as other indicators for both types of banks. In Bulgaria are main financial intermediaries and they hardly have an alternative in the economy as a channel for accumulating savings and granting loans. The paper investigates the factors for the weak correlation between the GDP growth and ROA and ROE as well as the net interest margin and net noninterest margin for the bigger and medium-sized and small banks. Some comparisons and peculiarities are drawn regarding profitability and efficiency of the five biggest banks in the country and the medium-sized and small ones.

Keywords: banks, profitability, efficiency.
The paper aims to investigate the factors that may influence the profitability and efficiency/ROA, ROE/ for the Bulgarian banks distinguishing them in two categories – large /TBTF/ banks and medium-sized and small banks. Certain coefficients and dynamics of financial instruments are analyzed individually for the five largest banks in the country/TBTF banks/ and the medium-sized and small bank /the rest of the banks in Bulgaria except the branches of foreign banks/. The five biggest banks represent 59,44% of the total assets in the banking system in the country as the end of June 2018.

The analyzed period is from March, 2007 to Dec., 2017 as public, quarterly data from the individual banks’ reports - balance sheet and statement of income – are used. The time period aims to include the crisis and post-crisis period in order to identify any peculiarities in the banks behavior resulting from the global financial crisis and affecting ROA and ROE. The analyzed ratios are ROA /Return on Assets, ROE /Return on Equity/, net interest margin /NIM/, net noninterest margin from fees and commissions /NNIM/, Loans-to-Deposits ratio, Own capital-to-Total Assets ratio, deposits’ growth and loans’ growth. The analyzed balance sheet items are the
amounts of loans, financial instruments and monetary balances which constitute the main part of the banks’ assets.

ROA and ROE are the main measures for the banks’ profitability – ROA is an indicator for the efficiency of the bank’s management and ROE is an approximator of the yield generated by the bank’s shareholders for the invested capital. The net interest margin measures the spread achieved by the bank management between the interest revenues and interest expenses through the control on the interest bearing assets and the cheapest resources for funding. The net noninterest margin /fees and commissions/ measures the spread of the revenues collected by the banks from fees and commissions on their products and services and the expenses related with the paid fees and commission.

Lending is the main activity for the Bulgarian banks and it is the main source for generating interest yield but also the main source of banking risk. Distinguishing significant deviations in the lending growth for certain banks can be an indicator for the accumulation of excessive risk in the lending portfolio. Deposits’ growth is sensitive to the appearance of risk on systemic level as the increase of deposits accumulated by the banks should be accompanied by an increase in loans as the banks try to place the accumulated resources and to generate positive income from them. Higher deposits’ growth by a single bank can be due to higher interest rates offered by that bank or the perception of the bank by the public as more stable /e.g. a TBTF bank/. The higher Own Capital-to-Total Assets ratio indicates better possibility by the bank to fund its activities with its own funds and respectively, higher stability. The Capital Requirements Regulation /CRR/ implements the requirement for a leverage ratio by the European banks which is the ratio between the Tier 1 capital and the total amount of balance and off-balance sheet assets as this ratio should be higher than 3%. Thus, a requirement for a minimum capital for funding the bank’s balance and off-balance exposures is implemented as the aim is to increase the bank’s ability to absorb losses as well as its resilience to external shocks. The Loans-to-Deposits ratio is also a measure for credit risk. Sharp increases in that ratio can be an indicator for a credit expansion by the bank and more risk concentration.

1. Large /TBTF/ banks

The five largest banks in Bulgaria prove to have higher credit growth in comparison with the small and medium-sized banks which can be due to more aggressive management by the banks and/or better perception of the banks products and services by the clients. The reciprocal Deposits-to-Loans ratio indicates to what extent the bank’s lending resources are funded through the accumulated deposits and not through non-depositary resources. The higher value of that ratio can be an indicator for the bank’s stability. The Bulgarian banking system is characterized with high values of that ration /135,19% as of the end of June 2018/ contrary to the euro area banking system /~50-54%/ . Deposits-to-Loans ratio for the five largest banks is 132,51% and for the medium-sized and small banks it is 138,15% as of the end of June 2018. Analyzing the dynamics of that ratio for both types of banks we can assume that medium-sized and small banks rely predominantly on deposits’ resources while the five
largest banks rely also on short-term funding and resources from the mother-banks despite their main source of funding is the depository base.

The five largest banks registered a decrease in Loan-to-Deposits ratio in the aftermath of the global financial crisis which was due to the deposit growth and the stagnation in lending as well as more conservative lending policy. The Own Capital-to-Total Assets ratio increases steadily during the analyzed period. ROA and ROE indicate positive values except for one bank which registered negative values but only for a very short period Q4, 2012 and Q3 and Q4, 2013. On group level ROA and ROE are higher compared with the medium-sized and small banks. The difference between NIM and NNIM decreases due to the conditions of falling interest rates and decreased interest rate spreads as well as the higher reliance on revenues generated from fees and commission on products and services offered by the banks. A constant tendency from the end of 2014 is the increase of monetary funds in the banks’ balance sheets as for some of the five largest banks their share even exceeds the share of the financial instruments /mainly government securities/. The figure below shows the dynamics for ROA, ROE, NIM and NNIM for the five largest banks in Bulgaria.

![Graphs of ROA, ROE, NIM, and NNIM](image.png)

**Fig. 1.** ROA, ROE, NIM and NNIM calculated for the five largest banks in Bulgaria.

Individual correlations are calculated for each of the five largest banks for the following indicators: GDP growth, assets’ growth, deposits’ growth, Loans-to-Deposits ratio and Own Capital-to-Total Assets ratio. Weak correlation is proved to
exist between the GDP growth and the rest of the indicators, i.e. the GDP has a weak
influence on deposits’ resources attracted by the banks and amount of lending by
the five largest banks. The level of interest rates and bank’s stability are the main deter-
minants for choosing a bank. Strong positive correlation is found between assets’
growth, credit growth and deposits’ growth /close to 1/ for each of the five largest
banks. The results are logical and expected as the loans dominate in the banks’ assets
and the rise in deposits is the main factor that supports the credit growth. Weak corre-
lations are found for both ratios - Loans-to-Deposits and Own Capital-to-Total Assets
with the rest indicators.

Correlation coefficients are calculated for each bank investigating the relation-
ship between NIM and 3m Sofibor and 3m Euribor. Time series are tested for auto-
correlation. The majority of loans in Bulgaria are agreed at flexible interest rates, i.e.
interest rates based on market index plus markup. An amendment in the Law in Con-
sumer Credit /2014/ and in the Law on Consumers’ Real Estate Loans determines that
the reference rate applied on consumer loans and loans for house purchases should be
a market index as Libor, Euribor, Sofibor and/or other indicators published by the
Bulgarian National Bank, National Statistical Institute or combination of both. Consi-
dering this we can argue that the values of Sofibor and Euribor should impact NIM.
The maturity of Sofibor and Euribor used for testing is 3 months. Higher correlation is
found between NIM and 3m Sofibor for all the banks compared with the lower values
of correlation between NIM and 3m Euribor. Negative correlation is found for all of
the five banks between NNIM and assets’ growth, i.e. we can assume that the increase
in assets is related with a decrease in NIM. Considering that the assets’ growth for the
banks in the first group is supported by growth in banks’ liabilities where non-interest
expenses are paid the values of the correlation coefficients are logical and expected.
However, the calculated correlation coefficients are low for each bank. The assump-
tions that we make for the relation between NNIM and 3m Sofibor and 3m Euribor
are for negative values for the correlation coefficients but opposite results are calcu-
lated. That can be explained by the fact that the majority of NNIM is achieved by fees
and commissions on loans. We assume that the GDP growth affects positively ROA
and ROE but the calculated correlation coefficients are very low. The economic up-
turn does not affect the banks’ profitability and the elements of ROA and ROE. Some
results of the correlation testing are presented in Table 1 below:

<table>
<thead>
<tr>
<th>NIM</th>
<th>3m Sofibor</th>
<th>3m Euribor</th>
<th>NNIM</th>
<th>Assets’ Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>UniCredit Bulbank</td>
<td>0.716308</td>
<td>0.610394</td>
<td></td>
<td>-0.201143</td>
</tr>
<tr>
<td>DSK Bank</td>
<td>0.706879</td>
<td>0.609084</td>
<td></td>
<td>-0.390847</td>
</tr>
<tr>
<td>FIB</td>
<td>0.517601</td>
<td>0.499622</td>
<td></td>
<td>-0.295336</td>
</tr>
<tr>
<td>Eurobank Bulgaria</td>
<td>0.610966</td>
<td>0.552547</td>
<td></td>
<td>-0.454058</td>
</tr>
<tr>
<td>UBB</td>
<td>0.731294</td>
<td>0.579932</td>
<td></td>
<td>-0.396987</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GDP Growth</th>
<th>ROA</th>
<th>ROE</th>
<th>Deposits’ Growth</th>
<th>Loans’ Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>UniCredit Bulbank</td>
<td>0.064223</td>
<td>0.050797</td>
<td></td>
<td>0.939047</td>
</tr>
</tbody>
</table>
2. Medium-sized and smaller banks

The total number of the small and medium sized banks that are analyzed is 16 and they have a market share of 37.38%. During the analyzed period negative values for ROA and ROE are calculated for some of the banks as well as huge dynamics in both indicators is evident, e.g. sharp decrease in ROE for some of the banks for certain periods. For some periods ROA and ROE are negative for some of the banks /e.g. 2012, 2014, 2016/ despite the positive NIM and NNIM as for certain banks that proved to be a long term tendency /e.g. 2 years period, 5 years period/. During the analyzed period ROE had more controversial dynamics compared to ROA. For only one bank negative values of NIM were calculated but they we were on a short-term basis /certain periods in 2013, 2015/. The share of financial instruments is stable over time as for some of the banks the share of financial instruments is higher that the share of monetary funds. For some of the banks the share of monetary funds has a constant growth since 2015. Monetary funds are the minimum required reserves and excess reserves on which a negative interest rate is applied since Jan. 2016. For a period of 2 year the excess reserves prevailed the minimum required reserves /≈120-130%/ but since the last quarter they have a strong decrease. The growth rate of deposits and loans is diverse for the different banks. The dynamics of NIM and NNIM shows outpacing decrease of NIM compared with NNIM. The analysis of both indicators shows that after the global financial crisis banks “concentrate” on generating revenues from fees and commissions from the products and services they offer trying to compensate the decrease in the interest revenues which is also common for the five largest banks. After 2015 some of the banks had sharp increase in the values of ROE arising from cleansing of credit portfolios /written off loans/ due to the upcoming AQR. For the analyzed period credit growth is supported by the deposit growth. Some small, segment oriented banks generate higher ROA, ROE, NIM and NNIM than the average levels for the banking system. An increase in the credit portfolios was also evident after the global financial crisis. Loan-to-Deposits ratio constantly decreased after 2015. Own capital-to-Total Assets ratio keeps stable dynamics as some banks support the credit growth with a capital increase. Some of the banks have very limited share of financial instruments in the asset side of their balance sheets contrary to others where the share of financial instruments exceeds the share of monetary funds. The figure below shows the dynamics of ROA, ROE, NIM and NNIM for five medium-sized and small banks /three of the largest and two of the smallest banks in terms of assets falling in that group/
Fig. 2. ROA, ROE, NIM and NNIM calculated for five banks representing medium-sized and small ones.

Certain peculiarities related with the activities or ownership structure can be distinguished for some of the medium-sized and small banks, e.g. BDB operates under special legislation and it is 100% owned by the Ministry of Economy, the majority of the shares of another bank is owned by Sofia municipality /60%/ as this bank predominantly holds financial instruments /government and municipal bonds/. One bank has gone through a procedure of special conservatorship for a period of 6 months in 2014 during which the majority of the credit portfolio of the bank was sold. That bank have negative values /with few exceptions/ of ROA and ROE for the whole period that is analyzed but NIM and NNIM are positive.

Individual correlation testing for each of the 16 banks is performed investigating the existence of relations for the same indicators as those analyzed for the five largest banks. Weak correlation between the GDP growth and the rest of the analyzed indicators is also found for the medium-sized and small banks. Except for 3 banks strong correlation is found between deposits’ growth and assets’ growth /1/. For the majority of the banks strong positive correlation is calculated for Own Capital-to-Total Assets ratio and Loans-to-Deposits ratio, i.e. we can assume for those banks that credit growth is supported by capital increase which is a prerequisite for stability and responsible behavior by those banks. Contrary to the five largest banks in the first group weak correlation coefficients are calculated for NIM and 3m Sofibor and 3m Euribor for some of the medium sized and small banks. For all of the banks negative correla-
tion is found between NNIM and assets’ growth as for 2 banks it has significant values -0.957635 and -0.939594/. At half of the banks negative correlation is found between NNIM and 3m Sofibor and 3m Euribor but the calculated values are small. For all medium sized and small banks very weak correlation is found between the GDP growth and ROA and ROE as well as between the asset growth, ROA and ROE similar to the results achieved for the large banks. The weak correlations for ROA and ROE discussed above for the bigger and medium-sized and small banks are further supported by the results achieved from the regressions tests for ROA and ROE set as dependent variables and the GDP growth/OLS method is used. Very low values of R² are calculated which confirms the lack of any evidence for relation between ROA and ROE and the GDP growth. The results from the regressions show very weak strength of the relations between NIM and 3m Sofibor and 3m Euribor for the bigger banks which led to further investigations proving that floating rates on loans granted by some of the bigger banks are based on Sofibor and/or Euribor with a maturity different than 3 months. The results from the regression testing for all bigger banks prove high values of R² as large negative coefficients before the assets’ growth indicate that the change in the bank’s assets strongly influences NNIM generated by the five largest banks contrary to both market indices.

**Conclusion:** The banks in Bulgaria play the main role in financial intermediation, channeling the accumulated savings to the borrowers in the economy. The majority of the interest revenues generated by the banks are through credit operations as in the periods of narrowing interest rate spreads both bigger and medium-sized and small banks direct their activities to generating non-interest income from fees and commissions on the products and services they offer. For the five largest banks in the country similarities in the dynamics of ROA and ROE is observed contrary to the medium-sized and small where the dynamics of both indicators is diverse during the analyzed period. GDP growth and assets’ growth have small impact on ROA and ROE both for the bigger and medium-sized and small banks. For the medium-sized and small banks credit growth is supported by an increase in the banks’ capital.

**References**