Influence of the Scale Effect Upon the Financial Results of the Banks in Bulgaria

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Abstract. The object of attention in the article is the profitability and efficiency of the banks in Republic of Bulgaria. The subject of the development focuses onto the influence of the credit institutions size upon their financial results. The objective of this study is to either to reveal that there are sufficient grounds to believe that the effect of the scale renders its influence upon the profitability and efficiency indicators or such a dependency can hardly be found. This study comprises observations about the processes in the banking sector of the country for the period 2007–2016. A coefficient analysis was employed, using a system of indicators suitably selected to this end. Certain dependency between the size of the banks in Bulgaria and the values of these financial indicators was established on the basis of the analysis of the real empirical data. It was concluded that utilizing the scale effect influence the large credit institutions manage to derive certain advantages in comparison to the smaller in size banks. The idea that by means of further consolidation of the banking sector of the country its efficiency can be increased, was substantiated.

Keywords: banks; banking system; size of banks; economies of scale; banking sector consolidation

For citation: Vatev Z.V. Influence of the Scale Effect Upon the Financial Results of the Banks in Bulgaria. Finance: Theory and Practice, 2017, vol. 21, issue 4, pp. 88–99.

УДК 336.7
JEL G21
DOI 10.26794/2587-5671-2017-21-4-88-99
INTRODUCTION
One of the main criteria for classification of the banks in a country is according to their size. Reviewing the reference literature shows that the question of the relative advantages and disadvantages of the large and the smaller in size banks is debatable [5–7]. As an advantage for the large-size credit institutions was pointed out the fact that the considerable scale of the activity contributes to offering of a wider range and more diverse products, helps in diversification of the bank portfolios and in avoidance of excessive concentrations. Large banks are considered more competitive and more sensitive to innovations in the financial industry. Their policy is usually oriented towards more risky, but highly profitable investments, and they are better adaptable to the respective regulatory requirements. It is traditionally assumed that in any critical situation, the probability for the state to support a large-size bank is greater than if it was about saving of a smaller bank (“too big to fail”). The following disadvantages of the large banks are pointed out: greater inertness of the banking activity, harder adaptability to changes of the external conditions, more complex and more expensive management, more limited interest in servicing small customers, danger of taking greater risks, related to the large-scale transactions. On the other hand, the smaller banks also have their advantages — greater flexibility, easier adaptability to abrupt changes of environment, more simplified management, striving towards more moderate and balanced policy, etc. Concerning their disadvantages, they are usually related to the limitations in provision of large credits and servicing big customers, difficulties in diversification of the operations, harder access to the financial markets, etc.

To a certain extent, the outlined comparative advantages and disadvantages of the large and smaller banks have more general nature. It is another question to what extent these can be substantiated by empirical data and what is their exact manifestation on the background of the specifics of the bank industry in the respective country.

The object of attention of this article is the financial results of the banks in Republic of Bulgaria. The subject of the development is directed towards the intensity and the direction of influence of the factor of bank size upon these financial results. The objective of the study is to establish whether the effect of the scale renders its influence upon the profitability and the efficiency of the banks in Bulgaria or such dependency can hardly be found.

Two work hypotheses will be formulated for the needs of this study:
• First hypothesis — the size of the banks in Bulgaria virtually renders no influence upon their financial results. The core of it consists in the fact that the effect of the scale renders no significant effect upon the commercial viability and the efficiency of the credit institutions so, from this point-of-view “size does not matter”;
• Second hypothesis — there is a certain dependency between the size of the banks in Bulgaria and the status of a series of their key indicators, reflecting the final financial results from the banking activity. According to this hypothesis, the effect of the scale renders significant effect the last, meaning that for the banks in the country “size does matter”.

METHODOLOGY AND DATA
In the beginning, a reasoning of the criterion, which will be the basis to determine the bank size, should be provided. Different points-of-view can also be used to quantify their size. Nevertheless, the conventional criterion to judge the magnitude of the credit institutions is the asset size [6, 7]. We assume that the sum of assets is the most precise expression of the scale and scope of the banking activity.

To outline the tendencies in the financial sector, Bulgarian National Bank (BNB) divides the banks in Bulgaria according to their size into three categories. The first group comprises the five biggest banks in terms of the sum of their assets, whichever they may be as at any given moment. The second group includes the remaining small and medium-sized banks. A separate, third group comprises the branches of foreign banks in Bulgaria. The present study is based on this officially accepted classification. Further down, our attention focuses upon the financial results of the banks from the first group (the five largest banks) and the banks from the second group (the rest of the small and medium-sized banks). Due to certain specifics of the activity of foreign bank branches in the country (the ones from the third group), these have been intentionally not included in this study.

The dependency between the size of the banks, grouped into the two mentioned categories and some of their key financial indicators of profitability and efficiency, is to be analysed on the above grounds. Coefficient analysis is employed by using a system of indicators, selected in accordance with the above
outlined guideline of the study. To be more precise, the focus was placed on the following:

- **Cost-income ratio.** It expresses what part of the bank income covers the respective expenses and what part of the income remains to set up the net financial result [2], i.e.

\[
\text{Cost – income ratio} = \frac{\text{Sum of expenses}}{\text{Sum of income}}.
\]

Its values decrease with the increasing of the income and/or decreasing of the expenses, which is a favourable situation. Due to its complex nature the cost-income "scissors" is often used to evaluate the efficiency of the credit institutions.

- **Operating efficiency.** Key importance for establishing the income and expenses will have the operating ones, which are related to the main (typical) for the banks activities. Therefore, the operating expenses and income have sustainable nature and are constantly occurring. These are: interest expenses/income, received/paid fees and commissions, expenses/income from foreign currency transactions, from securities transactions, etc. The ratio of the considered expenses and income, renders its significant effect upon the so-called operating efficiency [6]:

\[
\text{Operating efficiency} = \frac{\text{Operating expenses}}{\text{Operating income}}.
\]

Lower values of the indicator (related to reduction of the operating expenses and/or increase of the operating income) are an indication of an increasing efficiency. The difference between the operating income and expenses expresses the net operating income.

- **Net interest margin.** The difference between the income and expenses for interests gives us the concentrated expression of the efficiency of the bank’s intermediary operation. For comparison, the net interest income is used by its relative value against the assets [1]:

\[
\text{Net interest margin} = \frac{\text{Interest income} - \text{Interest expenses}}{\text{Assets}} = \frac{\text{Net interest income}}{\text{Assets}}.
\]

This gives an idea of the efficiency of the active banking operations (their interest income), though not in themselves, but depending on the price of the resources attracted.

- **Efficiency ratio.** This popular financial indicator for evaluation of the commercial viability and efficiency of the credit institutions is based on the fact that the banking profits obtained from the sum of the net interest income and the other non-interest income after deduction of the respective non-interest expenses. In this particular case, we are based on the circumstance that usually, for the banks the non-interest expenses are larger than the non-interest income, i.e. for them the net non-interest income has negative value [6]. This necessitates that the interest income should have such an amount that the interest expenses will be recovered so that on the one hand, the remainder of them will be covered by those non-interest expenses, which have not be covered by the non-interest income, and on the other hand — to be sufficient so as to form certain profit. These deductions find their quantity expression in the following dependency [4]:

\[
\text{Efficiency ratio} = \frac{\text{Noninterest expenses}}{\text{Net interest income} + \text{Noninterest income}}.
\]

For example, if the efficiency ratio is 0,70, this means that 70% of the net interest income and the other (non-interest) income will cover the non-interest expenses, and the remaining 30% will be used to form up the profit. Lower levels of this indicator correspond to higher values of the indicators for commercial viability.

- **Non-operating expenses per unit of net operating income.** The management of the non-operating expenses and the control of their dynamics and structure are of considerable importance for the bank management. These include: administrative and management expenses, amortisations, provisions, rental payments, fines, etc. [3]. Due to its non-production nature, the increase of the latter ones represents an additional weight on the final financial result. For the needs of the comparative analysis, these are interpreted as relative quantity. The present study uses as a basis the size of the net operating income of the banks, i.e.
Non-operating expenses per unit of net operating income = \( \frac{\text{Non-operating expenses}}{\text{Net operating income}} \).

The non-operating expenses per unit of net operating income decrease with the decreasing the non-operating expenses and/or with the increasing of the net operating income. This situation will be favourable, if the values of the coefficient are comparatively lower when compared to the other banks or a decrease tendency is observed. Otherwise, this may suggest excessive staff employment, inefficient management policy, deterioration of the quality of assets, etc.

- **Administrative expenses per unit of assets.** Administrative expenses have their significant weight in forming up of the non-operating expenses. These are unavoidable, but their keeping the unreasonably large will render negative effect on the profit and efficiency of the banking activity. As a relative quantity, these are often expressed as a percentage against the assets:

  \[
  \frac{\text{Administrative expenses}}{\text{Sum of the bank assets}} = \frac{\text{Administrative expenses per unit of assets}}{1}.
  \]

  Generally, the reduction of the values of this coefficient means higher efficiency. The situation is not favourable, if for a certain period the increase of the administrative expenses exceeds the one of the assets or if against the increasing of the former ones, a reduction of the latter ones is observed.

- **Net profit per unit of staff expenses.** The dependency between the banking profit and the staff expenses (wages, social security payments, etc.) bears valuable information from the human factor utilization point-of-view, i.e. [4]

  \[
  \frac{\text{Net profit}}{\text{Staff expenses}} = \frac{\text{Net profit per unit of staff expenses}}{1}.
  \]

  The indicator expresses the contribution of the staff to the final financial result.

- **Return on Assets (ROA).** Gives an idea of the amount of the bank profit, distributed per unit of assets [6]:

  \[
  \text{Return on Assets} = \frac{\text{Net profit}}{\text{Sum of assets}}.
  \]

Using this indicator is appropriate for the purposes of the present study, because the profit is a result from the overall banking activity, and assets best reflect its scope and scale.

On the basis of the financial indicators presented, we performed comparative analysis between the two groups of banks in Bulgaria, classified according to their size: the banks from the first group (the large banks) and the banks from the second group (small and medium-sized banks). The idea is to establish the dependency between the size of the credit institutions and their financial results.

This study comprises observations about the development of the banking sector in Bulgaria for a period of ten years (2007–2016). Several considerations played an importance role for the selection of the time interval. First, studying data about a longer period contributes to the better outlining the typical patterns in the manifestation of the scale effect upon the banks' financial results. Furthermore, this way the influence of some factors, which have a short-lived, temporary or accidental nature will be ignored. Second, from the point-of-view of the effect of the financial crisis upon the banking activity, the analysed period included three relatively differentiated stages: pre-crisis period (from 2007 to 2009), crisis period (from 2009 to 2014) and post-crisis period (after 2014). This allows for a more precise outlining of certain specifics of the dynamics of the processes in the banking sphere, during each individual stage.

The conclusions from this study are based on the officially published information by the Bulgarian National Bank on the status of the banking sector in the country.

**EMPIRICAL RESULTS**

Our further development specifies the testing of the formulated work hypotheses by means of an analysis of the real empirical data on the condition of the banking sector in Bulgaria.

Let us first begin by presenting the most popular of the indicators considered — the *cost-income ratio*. The data show that in the years before the occurrence of the economic crisis, the expenses on the banking system level were continuously on the rise. This is logical taking into account the increasing activity of the credit institutions (*table 1*). Nevertheless, the expenses were completely offset by the
income, which during this stage had a front-running growth rate. The consequences from the crisis after 2008 rendered negative effect upon the profitability of the banks. The thinning growth of the income in the crisis conditions forced them, as much as possible, to restrict their expenses. The cost-income “scissors” of the banking sector was gradually closing. The dynamics of cost-income ratio outlined a negative tendency — the total value for the sector marked a palpable increase from 0,74 in 2007 to 0,90 in 2013. It was only in the last years that there were some symptoms of overcoming of this negative dynamics. At the end of 2016, it almost restored its 2007 levels. The outlined tendency refers not only to the banking system as a whole, but also to most banks, regardless of their size. In the same time, the comparative analysis reveals structural differences, observed in the banks with difference scale of activity. The large vaults of first group are in a more favourable position — despite the worsened economic conditions, they maintained the income-to-expense ratio to a higher level in comparison with the smaller in size banks from the second group, or against the respective values for the banking sector, as a whole, respectively. On the average, for the ten-year period, it was 0,81 for the large-size institutions, while for the smaller-size ones it was 0,89. The outlined advantage of the larger banks in this aspect appears as a permanent tendency — it has been observed for the entire period analysed.

As to the operating efficiency coefficient (Operating expenses / Operating income), it is important to note that until 2013 it reported a constant deterioration both, for the banking system, and for the individual bank groups (table 2). Operating expenses increase at a quicker pace than the operating income. Interest expenses rendered the most significant effect upon this negative tendency. The fierce deposit competition and the popular “deposit tourism” between the banks, typical for the years of the crisis, found their expression in the aggressive interest policy carried out by them in the collection of deposits and in the maintenance of high deposit interest rates. This inertia was overcome after 2013. For the period

### Table 1

| Year | Sum of expenses (in thousands of BGN) | Sum of income (in thousands of BGN) | Cost-income ratio |
|------|--------------------------------------|-------------------------------------|------------------|
|      | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system |
| 2007 | 1844720  | 1338374  | 3512864  | 2614900  | 1680626  | 4456422  | 0,71  | 0,80  | 0,74 |
| 2008 | 2592266  | 1810848  | 4598547  | 3585209  | 2180919  | 5985296  | 0,73  | 0,83  | 0,77 |
| 2009 | 3139947  | 2076809  | 5458969  | 3675847  | 2348995  | 6239161  | 0,85  | 0,88  | 0,87 |
| 2010 | 3133509  | 2185932  | 5582100  | 3575635  | 2406498  | 6198763  | 0,88  | 0,91  | 0,90 |
| 2011 | 2945852  | 2427016  | 5610977  | 3379541  | 2600419  | 6197118  | 0,87  | 0,93  | 0,91 |
| 2012 | 2950492  | 2434556  | 5590060  | 3343397  | 2601741  | 6157538  | 0,88  | 0,94  | 0,91 |
| 2013 | 2727362  | 2531798  | 5372100  | 3256701  | 2599140  | 5956967  | 0,84  | 0,97  | 0,90 |
| 2014 | 2743283  | 1791796  | 4706419  | 3333558  | 1940220  | 5452732  | 0,82  | 0,92  | 0,86 |
| 2015 | 2505794  | 1738225  | 4376276  | 3243282  | 1913770  | 5274706  | 0,77  | 0,91  | 0,83 |
| 2016 | 2220067  | 1458849  | 3747544  | 3115118  | 1824864  | 5009878  | 0,71  | 0,80  | 0,75 |

Source: author’s own calculations based on data from URL: http://www.bnb.bg (accessed: 12.06.2017).

*Note: The values in the present and all following tables, referring to the banking system as a whole, include data not only for the banks of the first group (large banks) but also of the second group (smaller banks), along with ones concerning the activities of the banks of the third group (i.e. branches of foreign banks in the country).
from 2013 to 2016 inclusive, the operating expenses were reduced by impressive rates — more than twice. They reached levels far lower than in comparison with the ones in 2007. This was basically due to the drastic lowering of the interest expenses. The interest rates for the bank deposits in these years dropped substantially. Indeed, there were indications of certain decrease of the operating income in this period, but it was considerably smaller than the one of the operating expenses. Most of the stability of the operating income was substantiated by two circumstances. Firstly, the interest rates on the credits remained at a comparatively high level. The banking competition was redirected from deposit collection towards credit provision activity. Secondly, the significance of the income from fees and commissions, as an element of the operating income, increased. In these two aspects, the large banks demonstrated certain advantages in comparison with the rest. On the one hand, they managed to maintain higher interest rates on the credits, and on the other hand — offering wider range of services, they increased their income from fees and commissions. This data allowed us to draw the conclusion that as a whole, the large-size credit institutions have better operating efficiency when compared to the smaller size ones.

The general tendency is that under the conditions of crisis the banks in the country should operate with decreasing net interest income. The latter one gradually stabilizes only in the years after coming out of the crisis (table 3). At the same time, during the analysis of the data on the dynamics of the net interest margin, considerable differences between the large and the smaller banks were found. The advantage is mainly to the benefit of the former ones — they operate at considerably higher interest margin than the rest. The main reasons for it being the circumstance that for the analysed period the large banks in Bulgaria managed to maintain higher interest rates on the credits and lower ones on the deposits, and attract more customers, at the same time. This finding may appear illogical, but it has its reasoning: a) the large-size banks enjoy greater

| Year | Operating expenses (in thousands of BGN) | Operating income (in thousands of BGN) | Operating efficiency |
|------|----------------------------------------|----------------------------------------|---------------------|
|      | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system |
| 2007 | 698 083 | 6058 10 | 1369 158 | 2613 900 | 1680 624 | 4453 407 | 0.27 | 0.36 | 0.31 |
| 2008 | 1 250 997 | 908 028 | 2257 460 | 3567 788 | 2179 817 | 5967 807 | 0.35 | 0.42 | 0.38 |
| 2009 | 1 367 492 | 991 370 | 2420 886 | 3643 353 | 2348 995 | 6213 036 | 0.38 | 0.42 | 0.39 |
| 2010 | 1 149 262 | 1035 454 | 2259 163 | 3568 382 | 2406 481 | 6191 493 | 0.32 | 0.43 | 0.36 |
| 2011 | 1 085 644 | 1115 445 | 2268 522 | 3365 370 | 2600 419 | 6182 947 | 0.32 | 0.43 | 0.37 |
| 2012 | 1 114 725 | 1171 702 | 2325 376 | 3326 929 | 2601 741 | 6141 070 | 0.34 | 0.45 | 0.38 |
| 2013 | 1 230 573 | 1022 500 | 2238 834 | 3236 701 | 2590 205 | 5948 282 | 0.38 | 0.39 | 0.38 |
| 2014 | 838 519 | 647 709 | 1528 341 | 3333 558 | 1920 497 | 5432 939 | 0.25 | 0.34 | 0.28 |
| 2015 | 563 615 | 507 991 | 1070 751 | 3237 289 | 1913 770 | 5268 713 | 0.17 | 0.27 | 0.20 |
| 2016 | 509 844 | 403 987 | 923 702 | 3114 392 | 1818 918 | 5003 206 | 0.16 | 0.22 | 0.18 |

Source: author’s own calculations based on data from URL: http://www.bnb.bg (accessed: 12.06.2017).
popularity; b) they are in a position to generate greater confidence in themselves, and become centre of attraction for more customers; c) they own a well-developed branch network; d) they are in a position to provide users with both traditional credit and deposit products, along with a wider range of other services, meeting their individual needs.

The consequences from the economic crisis in the country rendered negative effect on the coefficient of efficiency (table 4). The negative tendency is well expressed after 2008 and continues until 2013. The reason for this takes its root in the circumstance that the increase of the non-interest expenses happens at a quicker pace than the net interest income and the noninterest income. The growth of the non-interest expenses originated mainly from the deterioration of the quality of the bank credit portfolios, causing significant increase of the expenses for provisions against their devaluation. It was only in the last three years (2014–2016) that the efficiency ratio altered its negative trend, though still far from the levels, which were typical for 2007 and 2008. However, we should note the fact that from the point-of-view of the considered indicator, the large banks from the first group are in a more favourable position in comparison with the small and medium-sized banks from the second group. This pattern was manifested during the whole analysed period. The average value of the efficiency ratio for the period 2007–2016 for the first group was 0,74, while for the second group it was 0,84. In this sense, the large banks of the sector demonstrated greater efficiency in comparison with the rest.

The analysis shows that the non-operating expenses take up a large relative share from the total sum of expenses of the banks in Bulgaria. If we compare data from table 5 and table 1, we will find out that over the individual years, it varied between 60% and 75%. It is interesting to note that the non-operating expenses exceed even the size of interest expenses. These facts contribute to the particular importance of the control upon the non-operating type of expenses. The non-operating expenses represented as ratio against the quantity of the net operating income, show multidirectional development trends (table 5). Under the unfavourable crisis conditions for the period 2009–2012 the indicator continuously deteriorated. The conclusion refers to the banking

### Net interest margin of the banks in Bulgaria in accordance with their size

| Year | Net interest income (in thousands of BGN) | Assets (in thousands of BGN) | Net interest margin |
|------|------------------------------------------|-----------------------------|--------------------|
|      | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system |
| 2007 | 1 369 946 | 740 614 | 2 171 581 | 33 400 697 | 22 786 572 | 59 089 503 | 4,10% | 3,25% | 3,68% |
| 2008 | 1 767 371 | 925 044 | 2 878 632 | 39 748 006 | 26 000 037 | 69 560 455 | 4,45% | 3,56% | 4,01% |
| 2009 | 1 766 764 | 976 380 | 2 847 031 | 41 076 648 | 26 208 651 | 70 184 446 | 4,30% | 3,73% | 4,06% |
| 2010 | 1 868 641 | 963 901 | 2 917 234 | 40 171 228 | 29 995 864 | 73 724 696 | 4,65% | 3,21% | 3,96% |
| 2011 | 1 709 854 | 1 056 757 | 2 868 973 | 39 730 860 | 33 602 309 | 76 811 182 | 4,30% | 3,14% | 3,74% |
| 2012 | 1 521 921 | 978 969 | 2 625 479 | 40 812 865 | 36 024 702 | 82 415 660 | 3,73% | 2,72% | 3,19% |
| 2013 | 1 354 834 | 1 095 206 | 2 540 914 | 42 511 878 | 37 811 402 | 85 746 670 | 3,19% | 2,90% | 2,96% |
| 2014 | 1 675 831 | 875 389 | 2 572 446 | 46 183 296 | 32 945 623 | 85 134 799 | 3,65% | 2,66% | 3,02% |
| 2015 | 1 745 858 | 954 943 | 2 771 123 | 50 157 997 | 33 995 963 | 87 524 257 | 3,48% | 2,81% | 3,17% |
| 2016 | 1 792 987 | 990 097 | 2 805 106 | 52 771 169 | 37 110 171 | 92 094 979 | 3,40% | 2,67% | 3,05% |

Source: author’s own calculations based on data from URL: http://www.bnb.bg (accessed: 12.06.2017).
In this period the non-operating expenses increased faster when compared to the net operating income. The significant increase of expenses for provisions against credit devaluation rendered strong negative pressure in the analysed aspect, originating from the deterioration of their quality (of the credits). It was only in the last years that the non-operating expenses per unit of net operating income gradually outlined the favourable tendency towards reduction. In the same time, if the attention is drawn to the values of the analysed indicator, which are characteristic about banks of different size, certain differences become evident. The large banks from the first group are in more favourable position. For them, the non-operating expenses per unit of net operating income for the entire period analysed are lower in comparison with the ones of the smaller banks from the second group (the average values of the indicator for the period for the first ones is 0,73, and for the others — 0,83). It is noteworthy that only for the period from 2007 to 2013 the non-operating expenses of the banks from the first group marked a growth of about 30%, while for the ones from the second group this increase reached more than 100%. Therefore, this data confirm that the influence of the scale effect is more tangible even concerning the non-operating expenses.

The effect from the achieving of economies of scale is particularly well pronounced against the administrative expenses. The data in table 6 show that in this aspect, the large banks in Bulgaria enjoy a marked supremacy. In 2016 when compared to the basis 2007, the expenses of administrative nature of the large banks increased by 13% (while assets’ growth was 58% for this interval of time). As to the small and medium-sized banks, this growth rate for the same period is significantly higher — 36% (while assets’ growth was 63%). In other words, it is typical for the large-size banks that the assets’ growth is accompanied by relatively smaller increase of the administrative expenses in comparison with the smaller banks. This reflects on the rate of the administrative expenses per unit of assets for both groups of credit institutions. The pattern, which is clearly distinguished, is that the banks from the first group will continuously report lower percentage of administrative expenses related to the assets when compared to the ones of the smaller banks.

### Table 4

| Year | Noninterest expenses (in thousands of BGN) | Net interest income (in thousands of BGN) | Noninterest income (in thousands of BGN) | Efficiency ratio |
|------|------------------------------------------|------------------------------------------|------------------------------------------|-----------------|
|      | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system |
| 2007 | 1213778     | 781311      | 2064957       | 1369946     | 740614      | 2171581       | 614012      | 382949      | 1036934       | 0,61 | 0,70 | 0,64 |
| 2008 | 1431559     | 949362      | 2468178       | 1767371     | 925044      | 2787632       | 657131      | 394389      | 1067295       | 0,59 | 0,72 | 0,64 |
| 2009 | 1846731     | 1129327     | 3144510       | 1766764     | 976380      | 2847031       | 615867      | 425133      | 1077671       | 0,78 | 0,81 | 0,80 |
| 2010 | 2038960     | 1197266     | 3428338       | 1868641     | 963901      | 2917234       | 612445      | 453951      | 1127767       | 0,82 | 0,84 | 0,85 |
| 2011 | 1911687     | 1367875     | 3450695       | 1709854     | 1056757     | 2868973       | 635522      | 484521      | 1167863       | 0,82 | 0,89 | 0,85 |
| 2012 | 1897971     | 1337565     | 3399138       | 1521921     | 978969      | 2625479       | 768955      | 525781      | 1341137       | 0,83 | 0,89 | 0,86 |
| 2013 | 1560904     | 1660189     | 3292759       | 1354834     | 1095206     | 2540914       | 715409      | 632325      | 1336712       | 0,75 | 0,96 | 0,85 |
| 2014 | 2020210     | 1225078     | 3374267       | 1675831     | 875389      | 2572446       | 934654      | 498113      | 1548134       | 0,77 | 0,89 | 0,82 |
| 2015 | 2074250     | 1310106     | 3496519       | 1745858     | 954943      | 2771123       | 1065880     | 530708      | 1623826       | 0,74 | 0,88 | 0,80 |
| 2016 | 1948894     | 1224973     | 3236765       | 1792987     | 990097      | 2805106       | 1050958     | 600891      | 1693993       | 0,69 | 0,77 | 0,72 |

Source: author’s own calculations based on data from. URL: http://www.bnb.bg (accessed: 12.06.2017).
### Table 5

**Non-operating expenses per unit of net operating income of the banks in Bulgaria depending on their size**

| Year | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system |
|------|-------------|-------------|----------------|-------------|-------------|----------------|-------------|-------------|----------------|
| 2007 | 1146637     | 732564      | 1943706        | 1915817     | 1074814     | 3084249        | 0,60        | 0,68        | 0,63           |
| 2008 | 1341269     | 902820      | 2341087        | 2316791     | 1271789     | 3710347        | 0,58        | 0,71        | 0,63           |
| 2009 | 1772455     | 1085439     | 3038083        | 2275861     | 1357625     | 3792150        | 0,78        | 0,80        | 0,80           |
| 2010 | 1984247     | 1150478     | 3322937        | 2419120     | 1371027     | 3932330        | 0,82        | 0,84        | 0,85           |
| 2011 | 1860208     | 1311571     | 3342455        | 2279726     | 1484974     | 3914425        | 0,82        | 0,88        | 0,85           |
| 2012 | 1835767     | 1262854     | 3264684        | 2212204     | 1430039     | 3815694        | 0,83        | 0,88        | 0,86           |
| 2013 | 1496789     | 1509298     | 3135266        | 2006128     | 1567705     | 3709448        | 0,75        | 0,96        | 0,84           |
| 2014 | 1904764     | 1144087     | 3178078        | 2495039     | 1272788     | 3904598        | 0,76        | 0,90        | 0,81           |
| 2015 | 1942179     | 1230234     | 3305525        | 2673674     | 1405779     | 4197962        | 0,73        | 0,88        | 0,79           |
| 2016 | 1710223     | 1054862     | 2823842        | 2604548     | 1414931     | 4079504        | 0,66        | 0,75        | 0,69           |

Source: author’s own calculations based on data from URL: http://www.bnb.bg (accessed: 12.06.2017).

### Table 6

**Administrative expenses against the sum of assets of the banks in Bulgaria according to their size**

| Year | Administrative expenses (in thousands of BGN) | Assets (in thousands of BGN) | Percentage of administrative expenses against assets |
|------|----------------------------------------------|-----------------------------|----------------------------------------------------|
|      | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system |
| 2007 | 722778      | 528130      | 1304375       | 33400697   | 22786572   | 59089503      | 2,16%       | 2,32%       | 2,21%         |
| 2008 | 884718      | 692011      | 1657904       | 39748006   | 26000037   | 69560455      | 2,23%       | 2,66%       | 2,38%         |
| 2009 | 864528      | 712136      | 1683282       | 41076648   | 26208651   | 70184446      | 2,10%       | 2,72%       | 2,40%         |
| 2010 | 860363      | 723869      | 1691376       | 40171228   | 2995864    | 73724696      | 2,14%       | 2,41%       | 2,29%         |
| 2011 | 863815      | 765071      | 1731662       | 39730860   | 33602309   | 76811182      | 2,17%       | 2,28%       | 2,25%         |
| 2012 | 870541      | 779643      | 1755073       | 40812865   | 36024702   | 82415660      | 2,13%       | 2,16%       | 2,13%         |
| 2013 | 789212      | 895863      | 1783370       | 42511878   | 37811402   | 85746670      | 1,86%       | 2,37%       | 2,08%         |
| 2014 | 906132      | 731717      | 1737773       | 46183296   | 32945623   | 85134799      | 1,96%       | 2,22%       | 2,04%         |
| 2015 | 990284      | 757062      | 1850151       | 50157997   | 33995963   | 87524257      | 1,97%       | 2,23%       | 2,11%         |
| 2016 | 816877      | 716097      | 1587481       | 52771169   | 37110171   | 92094979      | 1,55%       | 1,93%       | 1,72%         |

Source: author’s own calculations based on data from URL: http://www.bnb.bg (accessed: 12.06.2017).
Concerning the staff expenses on the banking system level, it can be noted that during the analysed period, these showed a tendency of slight increase (table 7). The analysis showed the presence of variable internal structural changes, brought about by the multi-directional influence of the two categories of banks, grouped according to their size. This finding was particularly well outlined for the period from 2008 to 2013. During this period, the banks from the first group (the large banks) reported reduction of staff expenses by 18% (from 384113 thousands of BGN to 313967 thousands of BGN). For the ones from the second group (the smaller banks), the reverse trend was found — they increased by 34% (from 287906 thousands of BGN to 384922 thousands of BGN). Considering this, it is no wonder that from the point-of-view of the efficiency, expressed through the quantity of the net profit, distributed per unit of staff expenses, the large banks in the country enjoy an impressive supremacy. On the average, for the period 2007–2016, the net profit per unit of staff expenses for them (1,75) is two times greater when compared to the one of the smaller banks (0,78). The influence of the scale effect is more tangible — against the staff expenses incurred by the banks from the first group, the latter ones generate two times greater profit in comparison with the one from the second group.

Achieving of sufficient and increasing profit is a priority task for each credit institution. The data presented about the dynamics of the net profit of the bank system in Bulgaria for the period 2007–2016 (table 8) show that during this interval of time three stages can be outlined. Until 2009 the profits of the sector increases by substantial amounts. The reason is the fast economic growth and the credit boom in the country during that period. The crisis after 2008 rendered its negative effect on the activity of the banks, the sign for which was the constant melting of their profit. Only for the period from 2008 to 2012 the latter one decreased more than twice

### Table 7

| Year | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system |
|------|-------------|-------------|----------------|-------------|-------------|----------------|-------------|-------------|----------------|
| 2007 | 770 180     | 342 252     | 1143 558       | 299 899     | 218 976     | 540 052         | 2,57        | 1,56        | 2,12           |
| 2008 | 992 943     | 370 071     | 1386 749       | 384 113     | 287 906     | 706 056         | 2,59        | 1,29        | 1,96           |
| 2009 | 535 900     | 272 186     | 780 192        | 368 261     | 292 925     | 698 980         | 1,46        | 0,93        | 1,12           |
| 2010 | 442 126     | 220 566     | 616 663        | 368 132     | 293 024     | 700 955         | 1,20        | 0,75        | 0,88           |
| 2011 | 435 235     | 172 763     | 586 141        | 357 047     | 326 387     | 722 811         | 1,22        | 0,53        | 0,81           |
| 2012 | 395 982     | 166 556     | 566 842        | 358 528     | 331 680     | 728 601         | 1,10        | 0,50        | 0,78           |
| 2013 | 509 339     | 673 42        | 584 867        | 313 967     | 384 922     | 735 300         | 1,62        | 0,17        | 0,80           |
| 2014 | 590 275     | 148 424     | 746 313        | 369 745     | 313 788     | 720 916         | 1,60        | 0,47        | 1,04           |
| 2015 | 737 488     | 175 545     | 898 430        | 392 511     | 308 253     | 737 218         | 1,88        | 0,57        | 1,22           |
| 2016 | 895 051     | 366 015     | 1262 334       | 397 771     | 341 010     | 755 238         | 2,25        | 1,07        | 1,67           |

Source: author’s own calculations based on data from URL: http://www.bnb.bg (accessed: 12.06.2017).
(from 1,386,749 thousands of BGN for 2008 to 566,842 thousands of BGN for 2012). It was only after 2012, when a positive tendency towards increase of the final financial result of the credit institutions was noted, and in 2016 it reached the levels from the pre-crisis period (1,262,334 thousands of BGN). The particular factors affecting the profit during the individual years had multi-directional effect. The most contradictory is the effect of the interest income. Until 2009, the bank profits were mainly supported by the considerable interest income. Under the conditions of the crisis, due to the reduction of the volumes and the decrease of the interest rates on credit provisions, the interest income continuously dropped, which rendered its negative effect on the financial results. The interest expenses had strong impact in negative direction over the first two years of the analysed period. At the same time, this influence was not so tangible, as it was completely offset by the increasing interest income. For the next years its negative impact is insignificant, and after 2013 — even positive (the interest rates on the deposits were perceptibly reduced, and respectively, the interest expenses were reduced). The only factor of permanent positive effect for almost the whole analysed period was the non-interest income. For most of the years though, its effect was not very notable. As to the non-interest expenses, they are constantly rendering negative impact on the profits, mostly, due to the deterioration of the quality of the bank credit portfolios and the increasing of the expenses for provisions against their devaluation. This factor had its strongest negative impact during the first years of the analysed period. The stabilisation of the profits at the end of the period (2016) was conditioned by: a) low interest expenses; b) the gradual reduction of the expenses for provisions; c) certain decrease of the administrative expenses. The problem was that to achieve permanent increase of the financial results cannot be done only by reducing the expenses, which has its objective limitations, without the respective expansion of the income

Table 8

Return on Assets (ROA) of the banks in Bulgaria depending on their size

| Year | Net profit (in thousands of BGN) | Assets (in thousands of BGN) | Return on Assets (ROA) — % |
|------|--------------------------|---------------------------|-------------------------|
|      | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system | Large banks | Small banks | Banking system |
| 2007 | 770,180    | 342,252     | 1,143,558     | 33,406,097  | 22,786,572  | 59,089,503  | 2,31%       | 1,50%       | 1,94%       |
| 2008 | 992,943    | 370,071     | 1,386,749     | 39,748,006  | 26,000,037  | 69,560,455  | 2,50%       | 1,42%       | 1,99%       |
| 2009 | 535,900    | 272,186     | 780,192       | 41,076,648  | 26,208,651  | 70,184,446  | 1,30%       | 1,04%       | 1,11%       |
| 2010 | 442,126    | 220,566     | 616,663       | 40,171,228  | 29,995,864  | 73,724,696  | 1,10%       | 0,74%       | 0,84%       |
| 2011 | 435,235    | 172,763     | 586,141       | 39,730,860  | 33,602,309  | 76,811,182  | 1,10%       | 0,51%       | 0,76%       |
| 2012 | 395,982    | 166,556     | 566,842       | 40,812,865  | 36,024,702  | 82,415,660  | 0,97%       | 0,46%       | 0,69%       |
| 2013 | 509,339    | 67,342      | 584,867       | 42,511,878  | 37,811,402  | 85,746,670  | 1,20%       | 0,18%       | 0,68%       |
| 2014 | 590,275    | 148,424     | 746,313       | 46,183,296  | 32,945,623  | 85,134,799  | 1,28%       | 0,45%       | 0,88%       |
| 2015 | 737,488    | 175,545     | 898,430       | 50,157,997  | 33,995,963  | 87,524,257  | 1,47%       | 0,52%       | 1,03%       |
| 2016 | 895,051    | 366,015     | 1,262,334     | 52,771,169  | 37,110,171  | 92,094,979  | 1,70%       | 0,99%       | 1,37%       |

Source: author’s own calculations based on data from URL: http://www.bnb.bg (accessed: 12.06.2017).
The above considerations explain the reasons why the return on assets (ROA) of the banking sector varied broadly over the last ten years in the country.

If we draw the attention to the situation in the large and in the smaller in size banks, the values of ROA will present to a great extent the complex patterns, outlined within the study of the previously mentioned financial indicators. The analysis shows that there is a certain dependency between the size of the banks and the commercial viability of their assets. The data confirm the influence of the scale effect to the benefit of the large banks from the first group. The latter ones report higher Return on Assets (ROA) in comparison with the banks of smaller size — both, in each and every of the analysed years, and as the average value for the period.

CONCLUSIONS
The exposition above allows us to do the respective inferences concerning the work hypotheses formulated at the beginning. The first hypothesis, according to which the size of the credit institutions had no significant effect on their financial results, cannot be confirmed. The results from this study proved the second hypothesis — utilizing the influence of the scale effect, the large credit institutions in the country managed to derive considerable advantages when compared to the smaller in size banks, which eventually, is reflected by their better financial results.

This finding corresponds to the need of continuation of the process of consolidation of the bank system in Bulgaria that has already started. This necessity is further intensified against the background of: a) comparatively limited economic activity in the country; b) existence of significant number of too small in size credit institutions with limited scope of activity; c) the overall increase of the regulatory requirements to the banks, in accordance with the requirements of Basel III. Proceeding from this we believe that consolidation of the banking sector is one of the routes to increase its efficiency.

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