NATIONAL BANK OF SERBIA

RESULTS OF THE QUANTITATIVE IMPACT STUDY OF NEW STANDARDS ON CAPITAL, RISK-WEIGHTED ASSETS AND LEVERAGE RATIO

August 2015

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I. INTRODUCTION

The second phase of the Strategy for Implementation of Basel III Standards in Serbia (hereinafter: Strategy), adopted in December 2013 and amended a year later, addresses the assessment of the effects and determination of the dynamics for Basel III Standards implementation.

Although the Serbian banking sector is adequately capitalised and highly liquid under the current regulatory framework, it was necessary to assess the effects of the implementation of new standards before introducing any of their elements or amending the regulatory framework, given important and numerous novelties that Basel III entails – both the ones regarding capital adequacy ratios and the ones pertaining to liquidity ratios. In this sense, the key activity in the second phase of the Strategy implementation, which is currently being carried out, is drawing up a quantitative impact study of new standards on capital adequacy and liquidity of the entire banking sector and individual banks.

Having in mind that conducting a quantitative impact study requires the use of substantial resources in banks, it has been envisaged to carry out this study in two phases. The first phase includes analysing the effects of the introduction of new standards regarding capital, risk-weighted assets and leverage ratio, while the second phase would assess the impact of regulatory amendments governing liquidity.

This document will present the results of a quantitative impact study of the introduction of new standards on capital, risk-weighted assets and leverage ratio in the manner prescribed by the *Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012* (hereinafter: Regulation). The quantitative impact study presupposes the full implementation of the said standards without considering the transitional provisions set forth by the Regulation.

To obtain the data necessary to assess the effects of the introduction of new standards on capital, risk-weighted assets and leverage ratio, the National Bank of Serbia (hereinafter: NBS) has prepared *Forms for the purpose of carrying out quantitative impact studies of the introduction of Basel III standards on capital, risk-weighted assets and leverage,* and *Guidelines for filling out forms for the purpose of carrying out quantitative impact studies of the introduction of Basel III standards on capital, risk-weighted assets and leverage,* available at the NBS website (Serbian language only).

During this phase of the quantitative impact study, banks participated in a preliminary (test) reporting of data, in the form prescribed and per given

guidelines, as at 30 September 2014, as well as in the submission of data as at 31 December 2014 after the closing of accounts. The purpose of the test reporting was to identify all the problems and doubts regarding the form completion so as to minimise the risk of obtaining incorrect data.

This document will present the results of the quantitative impact study containing the data as at 31 December 2014, obtained based on the data that banks submitted by 11 May 2015.

For the purposes of some parts of the analysis, banks were divided into *peer* groups, whereby *peer 1* group comprised banks with the share of over 5% in the balance sheet assets of the banking sector, *peer 2* group consisted of the banks with the share ranging from 1% to 5% and *peer 3* group included banks whose share measured less than 1% of the said assets.

The analysis also rested on the static balance sheet of banks, which means that the effects of the introduction of new standards were assessed based on a single point in time, as at 31 December 2014, without taking into consideration planned activities of the bank management aimed at increasing capital or reducing risk-weighted assets.

The effect of new standards introduction

The Serbian banking sector is **adequately capitalised,** which is also confirmed by the results of the quantitative impact study of new standards on capital, risk-weighted assets and leverage ratio – which indicate that Serbian banks would have no difficulties in meeting the new minimum capital requirements set under Basel III standards. Had Basel III standards been implemented as at 31 December 2014, without taking into account transitional provisions set forth by the Regulation, **capital adequacy ratio** of the banking sector would **rise from 19.86[1]% to 20.63%[2]**.

R**isk-weighted assets would increase by RSD 27.6 bln** (1.63%), but the **regulatory capital would also rise by RSD 18.7 bln** (5.56%), which would result in the stated increase of the capital adequacy ratio of the banking sector.

A rise in regulatory capital would be, among other things, driven by the changes in the manner of amortisation of the subordinated liabilities, i.e. the possibility to include a certain amount of such liabilities into the Tier 2 capital of the bank in the last year prior to maturity and by cancelling any limitation for including the amount of these liabilities into the regulatory capital of the bank. Also, a positive effect on the amount of the regulatory capital would come from

[1] In the calculation of the ratio for the banking sector only the data submitted by banks were used.

[2] The analysis focuses on a conservative approach by which the required reserve for estimated losses is treated as a deductible from regulatory capital of the bank and in calculating risk-weighted assets. Bearing in mind that the Special Diagnostic Studies, whose focus is on a conservative application of International Financial Reporting Standards (IFRS) by banks and on assessing the adequacy of the established provisions, are currently in progress the analysis kept conservative treatment of required reserves for estimated losses.

the possibility for bank investment into Common Equity Tier 1 instruments of entities in the financial sector in which the bank has a significant holding which does not exceed 10% of the Common Equity Tier 1 capital of the bank to be included, after the application of appropriate adjustments, into the calculation of risk-weighted assets with the weight of 250%, instead of as a deductible from the bank capital, as well as from the possibility to include retained earnings from the current year into the bank capital before the bank assembly determined the final amount of such earnings.

The largest contribution to a change in the amount of risk-weighted assets would come from changes relating to the calculation of risk-weighted assets for operational and credit risk, the introduction of a new capital requirement for the Credit Valuation Adjustment risk and finally from the changes related to market risks.

The following table shows the effects of introducing Basel III standards on capital adequacy ratio, as well as on numerator and denominator of the ratio.

Table 1: Effects of introducing Basel III standard on capital adequacy ratio

			Risk exposure amount			
	CAR	Regulatory capital (in 000 RSD)	Credit Risk (in 000 RSD)	Market Risk (in 000 RSD)	Operational risk (in 000 RSD)	CVA Risk (in 000 RSD)
Basel III	20.63%	355,606,757	1,384,821,779	24,162,679	307,812,904	6,697,307
DCA	19.86%	336,862,681	1,464,946,471	25,713,196	205,208,600	0
Δ	0.77	18,744,076	-80,124,692	-1,550,517	102,604,304	6,697,307

Apart from the total regulatory capital adequacy ratio, Basel III standards have introduced two new minimum capital requirements i.e. the Tier 1 capital ratio with the prescribed minimum of 6% and Common Equity Tier 1 capital ratio with the minimum of 4.5%. According to the results of the quantitative impact study**, the Tier 1 capital ratio** of the Serbian banking sector would stand at **18.11%** which would be 0.6% above the existing Tier 1 capital ratio of 17.5% as recorded on 31 December 2014. Also, if Basel III standards were applied as at 31 December 2014, **the Common Equity Tier 1 capital ratio** would stand at **17.69%**.

When the results of the quantitative impact study are observed across single banks, it can be concluded that the majority of banks would be able to meet the minimum capital adequacy ratios.

Leverage ratio is an indicator not based on the level of assets' riskiness and was introduced by Basel III standards with a view to preventing excessive indebtedness of banks and serving as additional protection from model risks. Judging by the results of the quantitative impact study, **leverage ratio** of the banking sector would measure **10%**. **All values of this indicator reported by the banks would be above the proposed minimum of 3%** that is currently being reviewed by the Basel Committee and the European Commission.

II. QUANTITATIVE IMPACT STUDY RESULTS

1. Capital adequacy ratios

One of the prime goals of Basel III standards is to improve the resilience of the banking sector, primarily by increasing both the quality and the amount of the banks' regulatory capital. The said standards therefore set additional minimum capital requirements that build on Basel II standards and establish more strict criteria for the inclusion of certain items into the regulatory capital and calculation of risk-weighted assets.

The mentioned standards, apart from the total capital adequacy ratio, envisage two additional ratios – Common Equity Tier 1 capital ratio and Tier 1 capital ratio. Given that the Decision on Capital Adequacy of Banks (RS Official Gazette, Nos 46/2011, 6/2013 and 51/2014, hereinafter: Decision) does not regulate all capital elements as envisaged by Basel III standards i.e. it does not stipulate Additional Tier 1 capital as a separate capital element, the said Decision fails to address all three capital adequacy ratios.

Under the Decision, the prescribed minimum capital adequacy ratio is 12%, reflecting a conservative approach the NBS opted for when implementing Basel II standards in Serbia, but the Tier 1 capital must amount to at least 50% of the (total) capital, which means that Tier 1 capital ratio must not fall below 6% – a requirement laid down by Basel III standards as well. Basel III standards also stipulate the minimum Common Equity Tier 1 capital ratio to be 4.5%.

Furthermore, given that new definitions of ratios are more precise than the ones prescribed by Basel II standards, there is no longer a need for some of the limitations as regards certain capital elements laid down by the Decision (in respect of the amount of subordinated liabilities and hybrid instruments included), while some of these limitations were changed (namely, eligible capital, which *inter alia* is used to determine large bank exposures and limits of investment into entities outside the financial sector and which comprises Tier 1 and Tier 2 capital that is equal to or less than one third of Tier 1 capital in accordance with Basel III standards).

The following table shows capital adequacy ratios which would have been reported in case of the full implementation of Basel III standards as at 31 December 2014. These ratios are presented for the banking sector as a whole and across *peer 1*, *peer 2* and *peer 3* groups. The table also presents the surplus of each capital element in respect of the regulatory minimum of capital

adequacy ratios which would have been recorded in case of Basel III standards implementation:

Table 2: Capital adequacy ratio values in accordance with Basel III standards

	Common Equity Tier 1		Tier 1		Regulatory capital	
	Adequacy ratio	Surplus (+) or shortage (-) vis-à-vis 4.5%	Adequacy ratio	Surplus (+) or shortage (-) vis-à-vis 6%	Adequacy ratio	Surplus (+) or shortage (-) vis-à-vis 8%
Banking sector	17.69%	227.299.393	18.11%	208.738.295	20.63%	217.727.184
peer 1	19.22%	162.594.783	19.26%	146.447.254	20.78%	141.192.668
peer 2	14.72%	56.034.520	15.95%	54.552.867	20.34%	67.701.621
peer 3	16.83%	8.670.090	17.00%	7.738.174	20.56%	8.832.894

Under Basel III standards, **total capital adequacy ratio** of the entire banking sector would measure **20.63%** which is 0.8 percentage points more than the actual 19.86% capital adequacy ratio recorded as at 31 December 2014. R**isk-weighted assets** would **rise by RSD 27.6 bln** (1.63%) under Basel III standards, but the **regulatory capital would also increase by RSD 18.7 bln** (or 5.56%), which would to lead to the said improvement in capital adequacy ratio of the banking sector.

Tier 1 capital ratio would measure **18.11%**, which is 0.6 percentage points above the actual value of 17.5% that was recorded as at 31 December 2014. Although risk-weighted assets would, as already said, rise by 1.63% **Tier 1 capital would increase by RSD 15.40 bln** (5.19%), contributing in turn to the stated increase in the Tier 1 capital ratio.

Had Basel III standards been implemented as at 31 December 2014, **Common Equity Tier 1 capital ratio** of the banking sector would stand at **17.69%**.

The highest value of the **total capital adequacy ratio** would be recorded for ***peer 1*** group of banks, whose ratio would stand at **20.78%**. In case of ***peer 1*** group, the value of this ratio, calculated in accordance with the Decision, measured 19.89% as at 31 December 2014, which means that Basel III standards introduction would bring about an increase of 0.9 percentage points in this ratio. This group would also record the highest **Tier 1 capital ratio**, which would step up by 0.7 percentage points (from 18.6% to **19.26%**). Further, this group of banks would post the highest **Common Equity Tier 1 capital ratio** which would amount to **19.22%**. The said changes in ratios of this

group of banks would come from **RSD 14 bln rise in the risk-weighted assets,** but also a **RSD 12.6 bln rise in regulatory capital.**

Peer 2 group would have a **total capital adequacy ratio** of **20.34%**, which would mean 0.5 percentage points more compared to 19.84% – the level actually recorded for this ratio under the Decision as at 31 December 2014. **Tier 1 capital ratio** of this group would stand at **15.95%**, thus exceeding by 0.3 percentage points the level actually calculated under the Decision as at 31 December 2014. **Common Equity Tier 1 capital ratio, of** this group would be **14.72%**. The introduction of Basel III standards among banks from this group would lead to a **RSD 9.8 bln rise in risk-weighted assets** and to a **RSD 4.7 bln expansion in regulatory capital**.

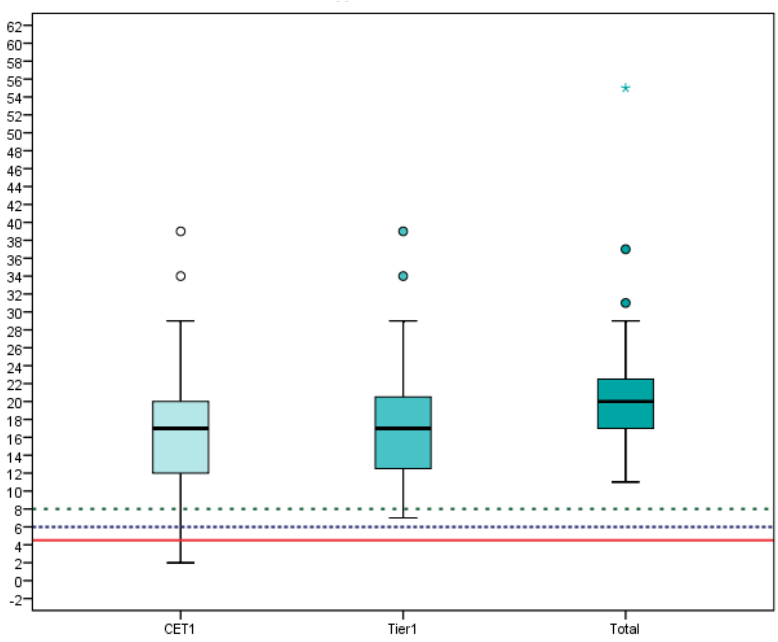
Also, **regulatory capital adequacy ratio** for ***peer 3*** group of banks would be **20.65%**, which is 0.98 percentage points more than the actual capital adequacy ratio posted by this group as at 31 December 2014.Tier 1 capital ratio of peer 3 group would amount to **17.00%**, which exceeds the actual level recorded as at the last day of 2014. by 2.41 percentage points, whereas the **Common Equity Tier 1 capital ratio** would be **16.83%**. If Basel III standards were implemented, this group would see an **increase in risk-weighted assets by RSD 3.8 bln** and **RSD 1.4 bln rise in regulatory capital**.

The said ratios, in the case of all three *peer* groups and the banking sector as a whole, by far exceed the Basel III minimum requirements. Consequently the banking sector would post a **capital surplus of RSD 217.7 bln,** in respect of the regulatory minimum capital adequacy ratio of 8%. Around 65% of this surplus comes from the *peer 1* group of banks, 31% from *peer 2* banks and the remaining 4% comes from *peer 3* banks.

The following chart presents the minimum and maximum values of the Common Equity Tier 1 capital ratio, the Tier 1 capital ratio and the total regulatory capital ratio of banks, their mean values and the first and third quartile.

Chart 1: Capital adequacy ratios

(in %)



The chart shows that the minimum value of Common Equity Tier 1 capital ratio would stand around 2%, while the minimum Tier 1 capital ratio and total capital ratio would be around 7% and 10% respectively. All banks would meet the minimum Tier 1 and total capital adequacy ratios, whereas **majority of banks would have Common Equity Tier 1 capital ratio above the regulatory minimum**. Mean value of adequacy ratio would stand around 17% – for Common Equity Tier 1 capital ratio, around 18% for Tier 1 capital ratio and around 20% for total capital adequacy ratio.

Based on the data presented up until now – it may be concluded that **the Serbian banking sector is adequately capitalised,** since even in the event of Basel III standards introduction as at 31 December 2014, capital adequacy ratios of the banking sector would be far above the minimum level laid down by Basel III standards. The analysis of individual banks also points to a conclusion that Serbian banks would face no difficulties when meeting the new minimum capital adequacy requirements under Basel III standards.

2. Regulatory capital

Under Basel III standards, the structure of the regulatory capital has been amended so that it comprises Tier 1 and Tier 2 capital (as until now), but the Tier 1 capital is composed of Common Equity Tier 1 capital and Additional Tier 1 capital. Basel III standards require a much larger number of requirements that capital instruments are to meet to be included into the certain elements of the regulatory capital and they set out in detail the purpose of some of the regulatory capital instruments, so that Tier 1 capital serves as a protection in the course of regular bank operation, while the Tier 2 capital assumes the protective role in the event of bankruptcy or liquidation.

The following table shows the amount of Common Equity Tier 1 capital, Additional Tier 1 capital and Tier 2 capital under the current regulation, as well as the effects of Basel III standards introduction on separate elements of the regulatory capital. The results presented are shown for the banking sector as a whole and across *peer* groups.

Table 3: Regulatory capital elements under Basel III standards
(in 000 RSD)

	Regulatory capital elements	Under Decision on Capital Adequacy of Banks	Under Basel III standards	Change	
				Δ	%
Banking sector	Common Equity Tier 1 capital	289,510,574	304,856,653	15,346,080	5.3%
	Additional Tier 1 capital	7,241,987	7,291,323	49,336	0.7%
	Tier 2 capital	40,110,121	43,458,781	3,348,660	8.3%
	Total regulatory capital	336,862,681	355,606,757	18,744,076	5.6%
Peer 1	Common Equity Tier 1 capital	202,416,744	212,304,299	9,887,555	4.9%
	Additional Tier 1 capital	436,849	422,309	-14,540	-3.3%
	Tier 1 capital	14,103,776	16,838,532	2,734,756	19.4%
	Total regulatory capital	216,957,369	229,565,141	12,607,772	5.8%

Peer 2	Common Equity Tier 1 capital	77,509,321	80,717,360	3,208,039	4.1%
	Additional Tier 1 capital	6,682,085	6,745,961	63,876	1.0%
	Tier 2 capital	22,691,339	24,118,905	1,427,566	6.3%
	Total regulatory capital	106,882,745	111,582,227	4,699,482	4.4%
Peer 3	Common Equity Tier 1 capital	9,584,508	11,834,994	2,250,486	23.5%
	Additional Tier 1 capital	123,053	123,053	-1	0.0%
	Tier 2 capital	3,315,006	2,501,344	-813,663	-24.5%
	Total regulatory capital	13,022,567	14,459,390	1,436,823	11.0%

As can be seen in the table total regulatory capital of the entire banking sector **would rise by RSD 18.7 bln** or 5.6% as a consequence of Basel III standards implementation. Observed by groups, the total regulatory capital of ***peer 1*** group would edge up by **5.8%**. As regards ***peer 2*** group, its total regulatory capital would up by **4.4%**, whereas ***peer 3*** group would see an **11%** increase in total regulatory capital.

Under Basel III standards, the Common Equity Tier 1 capital comprises of common shares of a bank, share premiums related to such instruments, retained earnings, other comprehensive income, funds for general banking risks and other reserves. The said standards envisage certain requirements that these instruments ought to fulfil to be included into the Common Equity Tier 1 capital, such as:

- That instruments are issued directly by the bank,
- That instruments have been paid up and that their purchase was not financed by the bank,
- That instruments have been classified as capital in accordance with accounting standards and clearly separated and presented in the balance sheet of the bank,
- That provisions governing instruments do not explicitly or implicitly state that the principal of the instruments may be reduced or redeemed save in the event of precisely defined conditions,
- That instruments meet the minutely defined conditions regarding distribution,

– That these instruments, in comparison to other instruments issued by the bank, take the first and proportionately greatest share of the banks' loss,

– That instruments are not secured, i.e. that no guarantee has been issued for them (neither by the bank nor by its related parties) which enhances the seniority of the claims,

– That no agreement is in place regarding the instruments (either formal or informal) which would enhance the seniority of claims in liquidation and bankruptcy proceedings.

If Basel III standards were implemented, **Common Equity Tier 1 capital** of the banking sector would **step up by RSD 15.3 bln** or 5.3%. The Common Equity Tier 1 capital would rise at the level of each separate *peer* group, whereas *peer 2* group would record the steepest increase, as shown in Table 2.

The positive effect on the amount of the Common Equity Tier 1 capital would come from the possibility of including retained earnings from the current year into the bank's capital prior to adoption of the assembly's decision on the final amount of such earnings. In addition, the possibility for banks' investments into Common Equity Tier 1 instruments of entities in the financial sector in which the bank has a significant holding which does not exceed 10% of the Common Equity Tier 1 capital of the bank after the application of appropriate adjustments to be included when calculating the risk-weighted assets with the weight of 250%, instead of a being treated as a deductible from the bank's capital, would also produce a positive effect. Another novelty introduced by Basel III standards is to include unrealised gains and losses arising from assets and liabilities measured at fair value when calculating the regulatory capital. Moreover, Basel III standards introduce new deductibles from the Common Equity Tier 1 capital, such as:

– Deferred tax assets which depend of the future profitability (for the purposes of the quantitative impact study banks were allowed to estimate the amount of this deductible and four banks have done so),

– Deductibles from the Additional Tier 1 capital exceeding the amount of such capital,

– Reciprocal cross holdings which competent authority considers to have been designated to inflate artificially the own funds of institution (this deductible was not a mandatory field for the purposes of the quantitative impact study, but if the banks applied such a deductible, they were required to state it in a separate form, which three banks have done).

It should be mentioned that no bank stated it had certain capital instruments that meet the requirements for inclusion into the Tier 1 capital under the Decision but fail to meet the requirements for inclusion into the Common Equity Tier 1 capital under Basel III standards, i.e. the total amount of paid up

common shares of the banks included in the core capital under the Decision were included into the Common Equity Tier 1 capital for the purposes of the quantitative impact study.

Additional Tier 1 capital is a new form of capital not prescribed as a separate element by the Decision. This capital element absorbs losses on a going concern basis and that it is subordinated to the claims of depositors, as well as ordinary and subordinated creditors. Unlike the Common Equity Tier 1 capital, these instruments do not have to meet the requirement of being classified as capital under accounting standards, which means that they may also be debt instruments and hybrid instruments. Also, these instruments may not be withdrawn or repurchase within five years from their issuance, and supervisor' consent is required for subsequent withdrawal or repurchase. The basic characteristic of these instruments is the existence of a clause which envisages that the principal amount of the instrument is temporarily or permanently written off or converted to Common Equity Tier 1 instruments after the occurrence of a specified event ("the trigger"). When contrasted to elements of the regulatory capital as prescribed under the Decision, this capital element **would rise by RSD 49.3 mln** or 0.7% at the level of the banking sector. Judging by the analysis results, all preferential non-cumulative shares of the bank that have met the criteria for inclusion into the core capital of the bank would also meet the criteria for inclusion into Additional Tier 1 capital, with the sole difference reflected in the amount of deductibles. Under Basel III standards, the total amount of banks' investment into instruments of Additional Tier 1 capital of entities in the financial sector in which the bank has a significant holding is treated as deductible from this capital element, while under the Decision such investments are regarded as a deductible from the total regulatory capital (half of such investments are deducted from the core capital and the other half is deducted from the supplementary capital). The said Additional Tier 1 capital increase at the level of the banking sector came from the fact that a deductible from the Additional Tier 1 capital of one bank exceeded the amount of such capital, and under Basel III standards, it was treated as a deductible from the Common Equity Tier 1 capital.

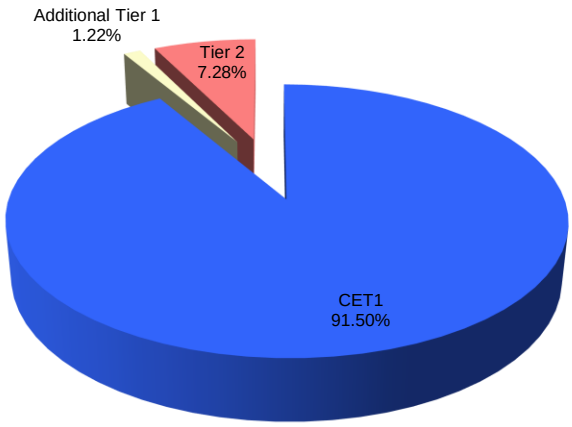
Peer group 1 would see a **3.3% drop** in Additional Tier 1 capital, which is a consequence of the previously elaborated manner of treating bank's investment into instruments of Additional Tier 1 capital of entities in the financial sector in which the bank has significant holding. This form of capital would rise in the case of ***peer group 2,*** also as a consequence of different treating of such investments, but it should be borne in mind that investment of one bank from this group into instruments of Additional Tier 1 capital of entities in the financial sector in which the bank had significant holding caused the amount of deductibles from Additional Tier 1 capital to exceed the amount of that capital, which automatically meant that such exceeding was a deductible

from the Common Equity Tier 1 capital, while under the Decision one half of this amount was deducted from the Tier 1 capital[3] and the other half from the Tier 2 capital. The amount of Additional Tier 1 capital in peer ***group 3*** would not change after Basel III standards implementation, as no bank from this group held investments into the instruments of Additional Tier 1 capital of entities in the financial sector which would be deducted from the Additional Tier 1 capital.

As regards the **Tier 2 capital**, it **would rise** at the level of the entire banking sector **by RSD 3.3 bln**, or 8.3% relative to the amount recorded as at 31 December 2014. Amendments envisaged by Basel III standards that would lead to a higher amount of Tier 2 capital are a different manner of calculating amortisation of subordinated liabilities and cancelation of restrictions on inclusion of these elements into the bank capital. These amendments would contribute to an increase in Tier 2 capital of *peer 1* and *peer 2* groups. The changes laid down by Basel III standards that would contribute to a reduction in the Tier 2 capital comprise measures under which a part of revaluation reserves would no longer be included into Tier 2 capital but into Common Equity Tier 1 capital, under *"other comprehensive income"*, provided all requirements have been met. The said amendment would be most pronounced in *peer 3* group whose Tier 2 capital would fall by 24.5%.

The following chart shows the structure of the regulatory capital at the level of the banking sector and it can be seen that **85.7%** of the regulatory capital relates to **Common Equity Tier 1 capital**, **2.1%** to **Additional Tier 1 capital,** and **12.2%** to **Tier 2 capital.**

Chart 2: Regulatory capital structure



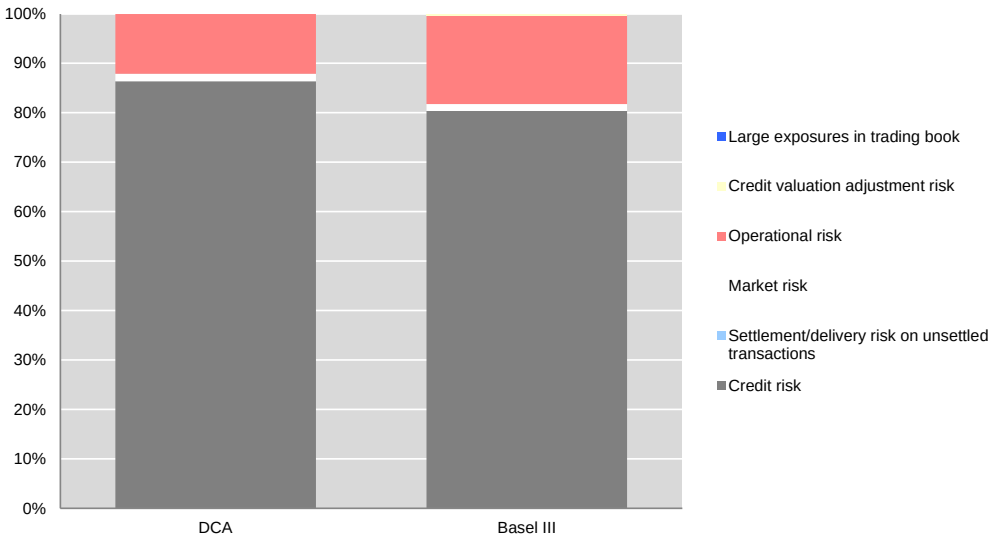
[3] For the purposes of the quantitative impact study, we have assumed that within the Tier 1 capital such investment in the instruments of Additional Tier 1 capital is a deductible from the Additional Tier 1 capital.

3. Risk-weighted assets

Introduction of Basel III standards would lead to a **RSD 27.6 bln** rise in the **total risk-weighted assets.** The sharpest increase would be recorded for ***peer 1*** group, whose risk-weighted assets **would surge by RSD 14 bln**. Risk-weighted assets of ***peer 2*** group **would climb by RSD 9.8 bln**. As a result of Basel III standards implementation the **total risk-weighted assets** of ***peer 3*** group **would edge up by RSD 3.8 bln.**

The following chart shows the structure of the risk-weighted assets per type of risk.

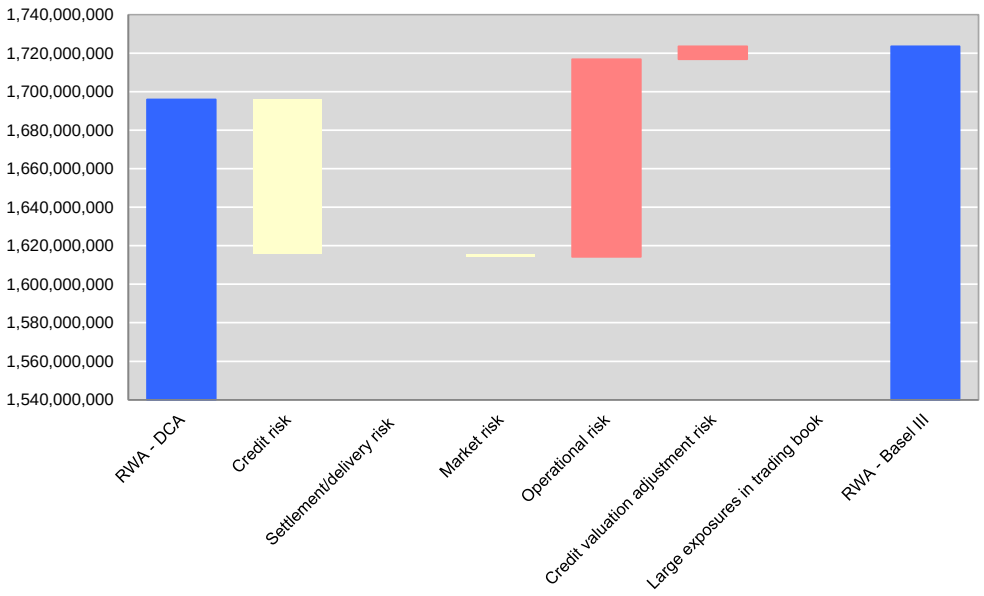
Chart 3: Risk-weighted assets structure



The structure of risk-weighted assets would undergo no significant changes, **credit risk** has by far the largest share of **80.3%,** and a new capital requirement has been introduced for the credit valuation adjustment risk. Risk exposure amount for credit valuation adjustment **risk** has a small **0.4%** share in the total risk exposure amount, but it should be borne in mind that two banks have opted to apply the multiplicative factor 10 on the amount of risk weighted assets for counterparty credit risk obtained by applying the original exposure method, for those exposures for which they should calculate credit valuation adjustment risk, instead of separately calculating risk exposure amount for this type of risk. Even after excluding this effect, the share of risk exposure amount for this type of risk would not rise significantly. Also, no bank presented the capital requirement for large exposures in their trading book.

The following chart shows the contribution to the changes in risk-weighted assets. It can be seen that the largest contribution to the changes in the amount of risk-weighted assets at the level of the entire banking sector would come from the changes pertaining to the calculation of risk exposure amount for operational risk, credit risk, credit valuation adjustment risk and finally the changes relating to market risk.

Chart 4: Contribution to changes in risk-weighted assets



3.1. Risk weighted assets for credit risk, counterparty risk and settlement/delivery risk for free deliveries

In the event of Basel III standards introduction, risk weighted assets for credit risk, counterparty risk and settlement/delivery risk in case for free deliveries would drop by RSD 80.1 bln (5.5%). Observed by bank groups – such assets of ***peer 1*** group **would slump by 5.8%**. As regards ***peer 2*** group, credit-risk weighted assets **would plummet by 5.2%**. Furthermore, in case of ***peer 3*** group, **credit-risk weighted assets would go down by 2.1%**.

Table 4: Credit-risk weighted assets under Basel III standards

		Under Decision in Capital Adequacy of banks (in 000 RSD)	Under Basel III (in 000 RSD)	Change Δ (in 000 RSD)	Change %
Banking sector	RWA – credit risk	1,464,946,471	1,384,821,779	-80,124,692	-5.5%
Peer 1		952,632,842	897,411,866	-55,220,976	-5.8%
Peer 2		459,319,813	435,524,818	-23,794,994	-5.2%
Peer 3		52,993,817	51,885,095	-1,108,722	-2.1%

The introduction of new standards that relate to the calculation of credit risk-weighted assets would not cause any significant changes in the amount of these assets and further in the document we will present the key changes that would pose positive and negative effects on the total amount of these assets.

The possibility to assign a more favourable risk weight to the exposures secured by mortgages on commercial immovable property would undoubtedly have the strongest positive effect on the amount of credit-risk weighted assets. Also, as regards the exposures secured by mortgage on residential property, it should be mentioned that the requirement set forth by the Decision under which the value of exposure or a part of exposure may not exceed 75% of the market value of residential real estate which is the subject of mortgage has been amended and raised to 80% of the market value of the residential real estate which is the subject of mortgage.

However, it should be noted that in the analysis option, which is prescribed by the Regulation, that competent authorities may determine higher weights for exposures secured by mortgages on residential property and mortgages on commercial property, if they deem it necessary based on collected data on losses arising from exposures secured by mortgages on immovable property, the estimates of the future development of the property market, and taking into account the need to preserve financial stability, was not applied, which led to the higher positive effects on the amount of risk-weighted assets.

A positive effect on the amount of risk-weighted assets would also come from the possibility to assign a 20% risk weight to the exposure to banks for which there is no available credit assessment by a nominated credit assessment institution with the original date of maturity shorter than three months. The limit for inclusion into the class of retail exposures has been raised but within that limit banks were to observe the exposure of both the parent company and its subsidiaries, including exposures that are in default, only excluding exposures entirely secured on residential real estate collateral which meet the

requirements to be assigned a 35% weight. Also, although the limit was raised, the banks were still obliged to be mindful whether they meet the requirements regarding the portfolio diversification of this type of exposure.

The negative effect on the amount of the credit risk-weighted assets stems from a broader definition of exposures in default class. Namely, under new standards, all exposures towards a debtor that entered into default are placed into the class of exposures in default (only in case of retail exposure can the default be observed at the level of individual exposure instead of the level of the total obligations of the debtor). Moreover, when determining whether a bank's claim toward a debtor should be classified within this class, it is not only liabilities of the debtor towards the bank that are observed, but also the liabilities of the debtor towards its parent company or any of its subsidiaries which are overdue for over 90 days and whose amount is materially significant.

New standards entail certain changes in respect of the techniques of credit risk mitigation, both the ones that would result in reducing and in increasing risk-weighted assets. On the one hand, changes regarding the acceptance of balance sheet netting would contribute to increase of risk-weighted assets since, under new standards, receivables and liabilities from loans and deposits that are netted are treated as cash collateral, provided that they are denominated in the same currency. On the other hand, the condition for accepting life insurance policy as an eligible collateral, which was not necessary to be met for the purpose of the quantitative impact study and which could lead to a decrease in risk-weighted assets, requires that the insurance policy has at least the same maturity date as the respective exposure, if the insurance contract expires before loan contract, provided the bank has secured that the amount arising from the insurance contract serves as collateral of bank claims until the loan contract expires. Also, apart from the credit protection provider deemed eligible under the Decision, the quantitative impact study regarded central counterparty and financial institutions eligible under certain conditions.

The final impact of the said changes at the level of the banking sector would be positive i.e. risk-weighted assets for credit risk, counterparty risk and settlement/delivery risk for free deliveries would drop. Observed by *peer* groups, the effects of the said changes would also be positive.

3.2. Exposures secured by mortgages on immovable property

Compared to the Decision, the Regulation introduces new rules for managing credit risk, concerning *inter alia* exposures secured by mortgages on

residential and commercial property. As in the Decision, the Regulation lays down the requirements that are to be met if the bank is to assign a more favourable weight of 35% to exposures secured by mortgages on residential property. Unlike the Decision, the Regulation sets forth the requirements for assigning a more favourable risk weight of 50% to exposures secured by commercial immovable property. Moreover, the Regulation prescribes that the competent authorities in the EU member countries may determine higher weights than the said ones for exposures secured by mortgages on residential and commercial property, building such judgment on the collected data on losses arising from exposures secured by mortgages on immovable property and forward-looking markets developments, while taking into consideration the need to preserve financial stability.

Within the quantitative impact study, banks were asked to deliver the data on value adjustments and gross carrying amount of claims secured by mortgages on immovable property– separately for the claims that meet the requirements for receiving a more favourable weight in the class of exposures secured by mortgages on immovable property and separately for residential and commercial property[4]. The share of the value adjustment in gross carrying amount per groups of exposures secured by mortgages on immovable property at the level of the entire banking sector and per *peer* groups is presented in the following table:

Table 5: Share of the value adjustment in gross carrying amount per groups of exposures secured by mortgages on immovable property
(in %)

Value adjustment rate	Group of banks	Residential property	Commercial property
For exposures whose gross carrying amount is below 80% of the market value of the residential property and below 50% of the market value of the commercial property	Banking sector	3.64%	7.98%
	Peer 1	3.91%	8.70%
	Peer 2	3.28%	5.15%
	Peer 3	1.86%	6.72%
For exposures that meet the requirements for more favourable treatment in the class of exposures secured by mortgages on immovable property, and gross carrying amount of total exposure is below 80% of the market value of the	Banking sector	0.48%	5.24%
	Peer 1	0.40%	6.34%
	Peer 2	0.65%	0.91%

[4] No bank within the quantitative impact study stated any exposure secured on residential or business real estate collaterals abroad.

residential property and below 50% of the market value of the commercial property	Peer 3	0.22%	0.72%
Total for exposures or parts of exposures secured by mortgages on immovable property	Banking sector	7.00%	13.86%
	Peer 1	7.19%	15.09%
	Peer 2	6.73%	11.66%
	Peer 3	9.28%	11.08%
For exposures or part of exposures meeting the requirements for a more favourable treatment in the class of exposures secured by mortgages on immovable property	Banking sector	2.18%	8.44%
	Peer 1	3.08%	12.18%
	Peer 2	1.62%	0.95%
	Peer 3	0.42%	1.76%

Judging by the table, it can be seen that the share of value adjustments, for exposures secured by mortgages on residential property, whose gross exposure is below 80% of the market value of the residential property, equals 3.6% at the level of the banking sector, while the same figure is significantly higher for exposures secured by mortgages on commercial immovable property, whose gross amount is below 50% of the market value of commercial immovable property, and as such measures 8%.

As expected, when we take into consideration the exposures whose gross amount is below 80% of the market value of the residential property and lower than 50% of the market value of commercial property and which meet the requirements for receiving a more favourable weight in the class of exposures secured by mortgages on immovable property, the said shares of value adjustment are significantly lower and measure 0.5% for residential property and 5.2% for commercial property.

When we expand our observation to include all exposures or parts of exposures secured by mortgages on immovable property (and not only exposures meeting the LTV indicator of 80% for residential property and 50% for commercial property), the shares of value adjustments in the gross carrying amount are higher and amount to 7% for residential property and 13.9% for commercial property.

Finally, as regards exposures or parts of exposures secured by mortgages on immovable property and meeting the requirements for a more favourable weight in the class of exposures secured by mortgages on immovable property, the share of value adjustment in gross carrying amount equals 2.2% for the

exposures secured by mortgages on residential property and 8.4% for exposures secured by mortgages on commercial immovable property.

Also, data delivered by banks indicate that the amount of exposures secured by mortgages on immovable property measures around RSD 819.5 bln[5], of which RSD 335.7 bln[6] pertains to exposure secured by mortgages on immovable property that meet the requirements for receiving a more favourable risk weight in the class of exposures secured by mortgages on immovable property.

3.3. Market and operational risk

Domestic regulatory requirements regarding the calculation of capital requirements for market and operational risk are to a large degree harmonised with new standards set forth by Regulation.

The following table shows the changes in the risk exposure amount for market and operational risks which could arise if Basel III standards were implemented as at 31 December 2014.

Table 6: Risk exposure amount for market and operational risk under Basel III standards

Type of risk	Group of banks	Risk-weighted assets (in 000 RSD)		Change	
		Decision on Capital Adequacy	Basel III	Absolute (in 000 RSD)	%
Market risks	banking sector	25,713,196	24,162,679	-1,550,518	-6.03%
	peer 1	11,074,437	10,274,065	-800,372	-7.23%
	peer 2	10,932,025	10,172,626	-759,400	-6.95%
	peer 3	3,706,734	3,715,988	9,254	0.25%

[5] RSD 308.4 bln relates to exposures secured by mortgages on residential property, while RSD 511.2 bln to exposures secured by mortgages on commercial property.

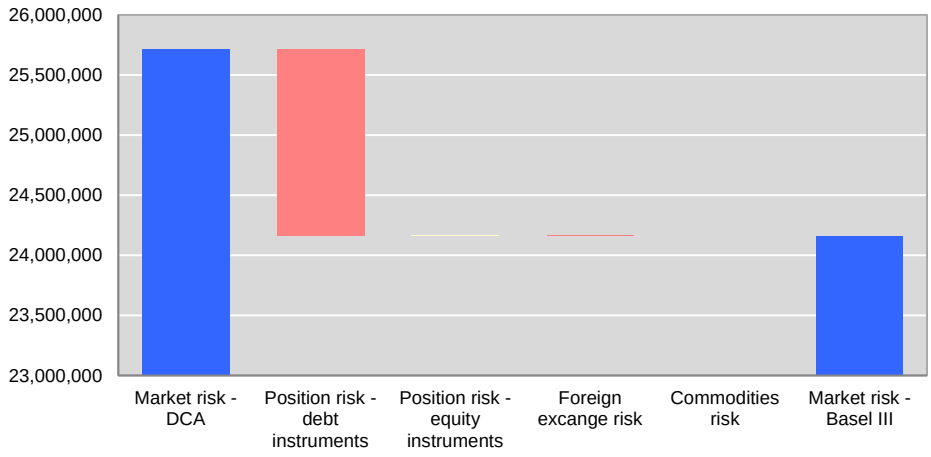
[6] RSD 145 bln relates to exposures secured by mortgages on residential property and RSD 190.8 bln to exposures secured by mortgages on commercial property.

	Position risk – debt securities	8,097,967	6,542,979	-1,554,988	-19.20%
	Position risk – equity securities	29,196	38,943	9,747	33.38%
	Foreign exchange risk	17,586,033	17,580,757	-5,276	-0.03%
	Commodity risk	0	0	-	0.00%
Operational risk	banking sector	205,208,600	307,812,904	102,604,304	50.00%
	peer 1	126,976,225	190,464,344	63,488,119	50.00%
	peer 2	68,412,300	102,618,451	34,206,151	50.00%
	peer 3	9,820,075	14,730,109	4,910,034	50.00%

The largest change in the part of calculating capital requirements for market risks relate to the changes in the part of capital requirements calculation applying the internal models. Given that no Serbian bank has yet submitted a request for the NBS consent for the internal model application, changes in the amount of risk exposure amount for market risk which could result as a consequence of Basel III standards implementation are not significant. At the level of the banking sector, the effect of Basel III standard introduction would be reflected in a **6% drop in risk exposure amount for market risk.** The sharpest **fall in risk exposure amount for market risk** would be recorded in ***peer 1*** group of banks – it would amount to **7.2%, *peer 2*** group would experience a **7% fall**, whereas such risk exposure amount of ***peer 3*** group **would rise by 0.25%.**

The largest contribution to the changes in the risk exposure amount for market risk comes from the reduction in risk exposure amount for position risk for debt securities. Introduction of Basel III standards would lead to a mild fall in risk exposure amount for foreign exchange risk and on the other hand a mild rise in risk exposure amount for position risk for equity securities. No bank has yet reported capital requirement for commodity risk, so the risk exposure amount for this type of risk is equal to zero. All of this is best shown in the following chart which illustrates contributors to changes in risk exposure amount for market risk.

Chart 5: Contributors to changes in risk exposure amount for market risk



Capital requirement for position risk arising from debt securities would drop by 19.2% as a consequence of Basel III implementation. The positive effect on the amount of capital requirements for this type of risk would come from a lower weight (0 instead of 0.1) applied on net positions in debt securities distributed in zone 1 in accordance with the duration-based method.

Capital requirement for position risk arising from equity instruments would rise by 33.38%, as a result of a different manner of calculating capital requirement for a specific position risk at which, under new standards, we arrive by multiplying the total gross position of banks in such instruments by 8% instead of 4%.

Capital requirement for foreign exchange risk would slump by 0.03% as a consequence of the possibility to allocate lower capital requirement based on positions in highly correlated currencies i.e. the possibility to calculate the capital requirement for matched net open foreign exchange positions in two highly correlated currencies as the amount of matched net open foreign exchange position multiplied by 4% instead of 8%.

On the other hand, the sole change in the manner of calculating risk exposure amount for **operational risk** that brought about the change in the level of this exposure was that it is calculated by multiplying capital requirement by 12.5 instead of 8.33, as a consequence of applying capital adequacy ratio of 8% rather than 12% for the purposes of the quantitative impact study. Consequently, the amount of risk exposure amount for operational risk at the level of the entire banking sector and in case of all three peer groups **would surge by 50%.**

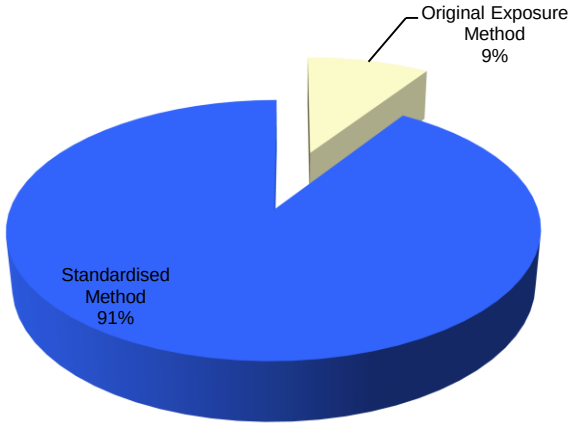
3.4. Credit Valuation Adjustment Risk

Basel III standards introduced a new capital requirement for the credit valuation adjustment risk that is calculated for all OTC derivatives except for credit derivatives recognized to reduce the risk-weighted assets for credit risk, but also for repo and reverse transactions, securities or commodities borrowing and lending transactions and margin lending transactions.

The aim of introducing such capital requirement is to allocate capital for coverage of losses that may arise when adjusting a group of transactions with the counterparty to the mid-market values, as a consequence of deterioration in counterparty creditworthiness. Basel II standards addressed only the counterparty default risk and allocated capital solely for that purposes, but failed to address the credit valuation adjustment risk which posed a significantly greater source of losses during the financial crisis.

It should be mentioned that for the purpose of the quantitative impact study certain transactions, depending on the type of the counterparty, could be excluded from calculation of capital requirement for credit valuation adjustment risk, including the transactions with the NBS.

Chart 6: Risk exposure amount for credit valuation adjustment risk



The amount of **risk exposure amount for credit valuation adjustment risk** of the banking sector measured **RSD 8.7 bln**, of which **RSD 6.5 bln** came from ***peer 1*** group and **RSD 2.2** bln from ***peer 2*** group, while no bank from ***peer 3*** group had the capital requirement for this type of risk. Apart from applying the standardised approach for the quantitative impact study, if the bank used the original exposure method when calculating exposure to counterparty risk arising from OTC derivatives, it could apply the

multiplicative factor 10 to the amount of risk-weighted assets for such transactions instead of calculating the capital requirement separately for this type of risk as three banks did.

Of the stated amount of risk exposure amount for credit valuation adjustment risk, **RSD 795.8 mln** was **obtained by using standardised approach** and **RSD 7.9 bln through original exposure method**, as shown in the following chart.

4. Leverage ratio

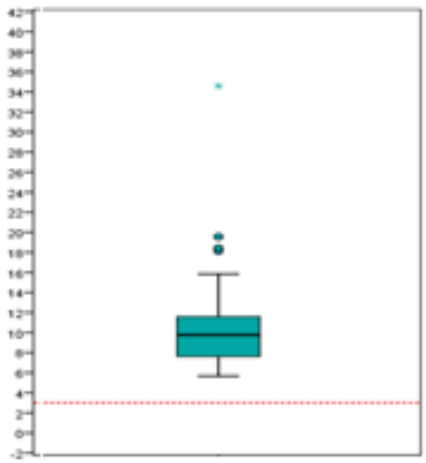
Leverage ratio is an indicator not based on the degree of assets riskiness and was introduced under Basel III standards with the aim of preventing excessive indebtedness of banks and as an additional protection from model risk.

Leverage ratio of the banking sector would measure 10%. The value of this ratio for ***peer 1*** group would equal **11%,** the same value as recorded **for *peer 3*** group**,** whilst the ***peer 2*** group would post leverage ratio of **9%**.

Leverage ratio value of all banks would be above the proposed 3% minimum whose adequacy is currently assessed by the Basel Committee and the European Commission. This is all presented in the following chart which also indicates that the mean value of this ratio is around 10%.

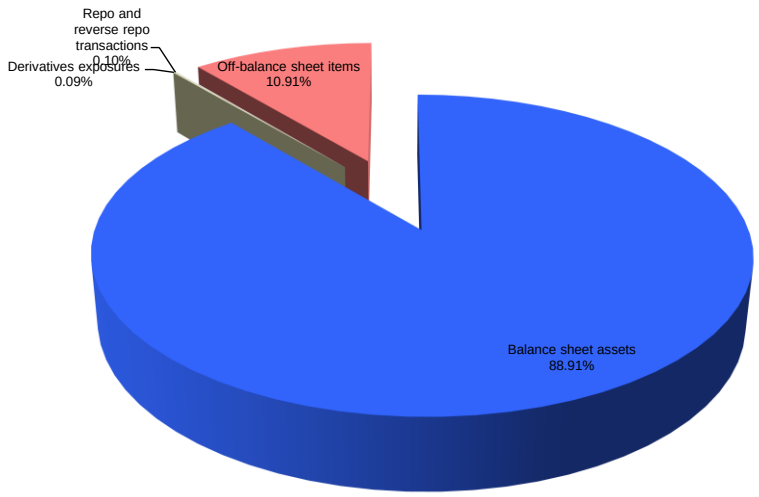
Chart 7: Value of the leveradge ratio

(in %)



The following chart shows the structure of the total exposure which is the denominator of the leverage ratio, based on which it can be observed that the largest share have the balance sheet exposures – 90% and off-balance sheet exposures – 10%, while derivative exposures and repo and reverse transactions have an insignificantly modest share.

Chart 8: Total exposure structure (denominator) in leverage ratio



The table below shows the leverage ratio figures if we assume that banks have already used a part of their Tier 1 capital to cover the capital requirement of 6% of risk-weighted assets i.e. 8.5% when we include the 2.5% capital conservation buffer. The table also shows the capital surplus that would be attained above the minimum leverage ratio of 3%.

Table 7: Leverage ratio values after the coverage of capital requirements

Tier 1 capital adequacy ratio 6%		Tier 1 capital adequacy ratio 8,5%	
LR (in %)	Capital surplus/shortage (in 000 RSD)	LR (in %)	Capital surplus/shortage (in 000 RSD)
7%	115,993,076	5%	72,905,709

The table clearly shows that leverage ratio would equal 7% – if banks have previously used a part of their Tier 1 capital to cover capital requirement of 6% of risk-weighted assets and it would measure 5% if banks have used a part of their Tier 1 capital to cover capital requirement of 8.5% of risk-weighted assets.

It should be mentioned that the ratio of the risk-weighted assets and the amount of exposure from leverage ratio equals 56%. If the said ratio was below

35.3%, leverage ratio would assume the role of the mandatory requirement instead of the 8.5% Tier 1 capital adequacy ratio, provided the 2.5% capital conservation buffer was also taken into account, whereas if the said ratio was below 50%, the leverage ratio would serve as the minimum requirement instead of the Tier 1 capital adequacy ratio of 6%. In the Serbian banking sector the mandatory requirement is the Tier 1 capital adequacy ratio.

III. CONCLUSION

Based on the quantitative impact study results, it may be concluded that Serbian banks would face no difficulties in meeting the new minimum capital requirements set forth by Basel III standards, given that capital adequacy ratio would by far exceed the regulatory minimum, both at the level of entire banking sector and per individual banks.

Given that the Serbian banking sector is highly capitalised i.e. that the capital adequacy ratio of the banking sector is far above the regulatory minimum of 12%, as set forth by the Decision, and 8% minimum stipulated by Basel III standards, and that nearly 90% of the regulatory capital of the banking sector relates to the Tier 1 capital and that the Tier 1 capital primarily consists of equity capital of highest quality, the results attained could have been expected.

This results come also as a consequence of certain conservative decisions made by the NBS in the process of implementation of Basel II standards, such as setting the minimum capital adequacy ratio at 12%, introducing required reserve as a deductible from capital and when calculating risk-weighted assets, but also the decision not to allow the application of a more favourable risk weight on claims secured by mortgages on commercial immovable property.

Moreover, it is necessary to bear in mind that changes introduced by Basel III standards focus, in terms of the risk-weighted assets, on the counterparty credit risk (such as the introduction of a new capital requirement for credit valuation adjustment risk, capital requirement for the so-called Wrong Way Risk, additional requirements for transactions with the central counterparty etc.), given that this type of risk led to greatest losses during the financial crisis, as well as on the part that relates to the implementation of advanced models for calculation of capital requirements for market risks (such as the introduction of new “stressed VAR” risk measure into the calculation of capital requirements for market risks). As no Serbian bank has yet filed a request for the NBS consent to apply the advanced model for calculation of capital requirement for market risks, and that the amount of risk-weighted assets for counterparty risk has a small share in the total risk-weighted assets, the said changes would have no materially significant impact on the risk profile of Serbian banks.

List of tables and charts

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