CERTAIN ASPECTS OF THE CAPITAL AND LIQUIDITY OF BANKS IN BOSNIA AND HERZEGOVINA

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Abstract

The latest standards in banking, as proposed by way of the regulations of the Third Basel Accord, aim to support banks in their tendency to absorb the shock waves produced by financial and economic stresses, no matter what their point of origin is. This document’s standards require banks to increase their capital, improve its structure, and thus improve the liquidity risk coverage. Regulators all over the world tend to impose and accelerate the implementation of these common regulations. However, many countries have not even started the process. This group of countries includes the banking system of Bosnia and Herzegovina, which has done very little to implement the process, as seen from the level of its banks' capital and the model of establishing liquidity. The reason for such a state of affairs lies primarily with the regulators in Bosnia and Herzegovina, who have neither drawn up such regulations nor adopted them. An examination of the official data from commercial banks has shown that the banking system of Bosnia and Herzegovina can and should meet the suggested standards, despite the fact that the new model of establishing banks’ liquidity is broader and more encompassing than the present one devised by the Banking Agency, because it takes into consideration more balance positions, both within a bank’s assets and liabilities, but also includes all the significant off-balance positions of a bank, which have not been previously included. Our final conclusion is that the banks in Bosnia and Herzegovina should adopt and implement the standards of The Second Basel Accord, and then proceed towards the application of the more advanced standards contained in the Third Basel Accord. This means that the banks in Bosnia and Herzegovina should first increase their capital, which will enable them to increase the deposits, and the increased deposits will, in turn, enable the required level of liquidity.

Keywords: capital, liquidity coverage ratio, risk, Bosnia and Herzegovina.

1 INTRODUCTION

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This paper has come about as a result of the directives and conclusions published by the Basel Committee on Banking Supervision as the regulations of the Basel III standards, which
address the details of new global capital and liquidity standards, supported by the leaders of the G-20 at the 2010 Seoul summit. To give a specific example of a medium-sized bank, a test was conducted in which the liquidity ratio was calculated according to Basel III and according to the existing regulations (decisions) passed by the regulatory organs of Bosnia and Herzegovina, and the results obtained were then compared and their effect was established. Besides, all the countries which are members of the Basel Committee are obligated to introduce the Basel III standards as national regulations by the end of 2013, and their implementation should be carried out in phases by 2019. The banking system of Bosnia and Herzegovina should act in the same or a similar manner, because it has accepted the previous accords as well, but the dynamics and deadlines of implementation should be determined by the regulatory organs of Bosnia and Herzegovina, and they should not differ significantly from those established in other countries.

2 THE BASICS OF THE THIRD Basel Accord

Basel III represents a global regulatory framework for stable banks, which consists of a set of reform measures aimed at providing support to the basic concept, i.e. the ability of banks to absorb the shock waves produced by financial and economic stresses, no matter what their point of origin is, or Basel III is an initiative for internationally coordinated regulatory change that is designed to offer a response to some of the inadequacies of the regulatory framework as it stood before the financial crisis of 2007-2011 (Gual, 2011). This is, in fact, a further, continual effort on the part of the Basel Committee to try to strengthen the regulatory framework of banks, supervision and the risk management function. The regulatory framework refers to the level of capital required to function as a shield against a bank’s bankruptcy, generating increased confidence among the bank’s clients and ensuring the bank’s growth in the long term (Đukić, 2007). A higher level of capital, combined with a new way of establishing a bank’s liquidity, should decrease the probability and severity of banking crises in the future. More precisely, the Basel III standards in banking establish a higher and better-quality level of capital in banks, a better and higher-quality coverage of the liquidity risk, and better measures for more successfully overcoming stress periods in banking, which include:

- a micro approach to a bank’s safety, and
- a macro approach to the safety of a bank and the banking system as a whole.

Basel III’s micro approach to safety tends to help increase the resistance of each individual bank in stress periods, because it establishes:

- a minimum common equity from 2 to 4.5% and a minimum Tier 1 capital from 4 to 6%. The minimum total equity (including both Tier 1 and Tier 2 equities) as a percentage of risk-weighted assets remains the same, i.e. 8%,
- various capital regulation instruments which have to meet stricter criteria, so that innovative/hybrid capital with incentives to purchase, which can currently be calculated according to Tier 1 may be abandoned over time, while the capital instruments of Tier 2 are coordinated. Tier 3 capital, previously available for covering market risks, will be eliminated, with a significantly more energetic supervision, risk management, and disclosure standards.

Through its macro approach, Basel III is introducing completely new elements into the global regulatory framework, such as:

- capital conservation buffers as additional capital, which may help protect banks from credit losses, and which can be activated in a

that meet the criteria for inclusion in Tier 2 capital (and are not included in Tier 1 capital); 2. stock surplus (share premium) resulting from the issue of instruments included in Tier 2 capital; 3. instruments issued by consolidated subsidiaries of a bank, held on behalf of third parties that meet the criteria for inclusion in Tier 2 capital and are not included in Tier 1 capital.

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1 Common Tier 1 capital consists of the sum total of the following elements: 1. common stock issued by banks which meet the classification criteria as common stock for regulatory purposes; 2. stock surplus resulting from the issue of instruments included in Tier 1; 3. retained earnings; 4. accumulated other comprehensive income and other disclosed reserves.

2 Common Tier 2 capital consists of the sum total of the following elements: 1. instruments issued by banks.
period of stress. The buffer value is 2.5% of
common equity. Also provided are counter-
cyclical buffers, which may be disclosed
during a crisis, and may be an extension of
capital buffers;

- a minimum leverage ratio will be introduced
  for systemically important banks, which
  should act as a preventive measure against
  further exposure to risk;
- greater capital requirements for commerce
  and securitization activities have been
  announced. Commerce reforms should
  initiate an introduction of new risk-weighting in
  order to manage the risks in commerce
  portfolios better;
- Basel III increases capital requirements and
  risk management standards for contracting
  parties exposed to credit risks stemming from
derivatives, securities and repo-financing
transactions. The goal is to decrease the risk
of transferring shocks between banks, and the
measures include, for instance, the use of
stress inputs in order to determine capital
requirements for contracting parties exposed
to credit risk and market losses stemming
from a deterioration of the creditworthiness of
contracting parties;

- Basel III also contains measures pertaining to
  the use of external credit ratings within the
capital framework. Among other things, Basel
III incorporates elements of The International
Organization of Securities Commission (IOSCO) into the Code of the Basic Credit
Ratings Agency, and will require banks to
conduct internal estimates of the outer
securitization exposures, and

- introduces a new way of measuring liquidity by
  way of the minimum Liquidity Coverage Ratio
(LCR) and the minimum Net Stable Funding
Ratio (NSFR). Although a long adjustment
period is allowed, markets are likely to
anticipate the required changes and penalize
banks that fall substantially short of the LCR
and NSFR liquidity requirements. Thus banks
need to increase the liquidity of their assets
and reduce the liquidity of their liabilities. and
reduce the liquidity of their liabilities (Allen,
2012).

For many banks, the implementation of the Third
Basel Accord represents a complex process which
takes a certain time to be applied, i.e. for
establishing the national regulations on the basis
of it, so that it is implemented in stages (phases)
which, according to the Basel Committee, should
unfold as follows: \(^3\)

\begin{table}
\centering
\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline
\hline
C Minimum Common Equity Capital Ratio & 3.50% & 4% & 4.50% & 4.50% & 4.50% & 4.50% & 4.50% \\
\hline
A Capital Conservation Buffer & 0.625% & 1.25% & 1.875% & 2.50% & & & \\
\hline
P Minimum common equity + capital conservation buffer & 3.50% & 4% & 4.50% & 5.125% & 5.75% & 6.375% & 7.0% \\
\hline
I Phase-in of deductions & 20% & 40% & 60% & 80% & 100% & 100% & \\
\hline
T Minimum Tier 1 Capital & 4.50% & 5.5% & 6.0% & 6.0% & 6.0% & 6.0% & 6.0% \\
\hline
L Minimum total assets & 8% & 8% & 8% & 8% & 8% & 8% & \\
\hline
Minimum total assets + conservation buffer & 8% & 8% & 8.625% & 9.25% & 9.88% & 10.50% & \\
\hline
L Liquidity coverage ratio – minimum requirement & 60% & 70% & 80% & 90% & 100% & & \\
\hline
I Net stable funding ratio & Min std. & & & & & & \\
\hline
\end{tabular}
\end{table}

Many global banks have already commenced increasing their capital even without the formal rules, with 100 largest world banks having already made a significant progress in that area. However, it cannot be said that the implementation of Basel III is on a satisfactory level, which is understandable, taking into consideration that the final deadline for its definitive implementation is 2019.

3 CRITIQUE OF THE BASEL ACCORDS REGULATIONS

Today, there already are theorists, as well as professionals, who criticize the regulations and requirements of the Third Basel Accord, especially in relation to the level of capital and the method of calculating it, and also in relation to the new model of calculating a bank’s liquidity level. Some are of the opinion that increasing the level of capital is not good at all, especially if new investors appear, for infusion of capital from the outside will affect control over banks, especially when new investors decide to cash their investments in a bank (Berk, 2011). Otherwise, banks tend to hold significantly more capital than required by regulators because regulatory requirements are not the only determining factor of actual capital levels (Slovik, P., & Cournede, B, 2011). Regulators from the EU have on various occasions criticized the USA for its slow implementation of the Basel Accords regulations in general, and on account of the fact that its banks have fallen behind in that respect, because they have not managed to make any significant progress in relation to the level of the banks’ capital in the past. Regulators from some countries are still working on their own regulations in that respect, so that, for instance, banks in the USA, apart from the regulations of the Basel Accord (capital adequacy ratio), also use the rule of financial leverage or the model of the capital-total bank capital ratio when establishing the criterion of the necessary level of capital in banks. According to the existing Basel regulations, a well-capitalized American bank is one having the total assets-risk-weighted assets ratio of at least 10%, and the primary (basic equity, Tier 1) capital-risk-weighted assets ratio of at least 6%, while simultaneously, according to the indicator of the

The USA, Great Britain, Germany.

FDIC – Federal Deposit Insurance Corporation, founded by the US Congress for the purpose of maintaining the stability of and public trust in the national banking system.
Basel III certainly shows a clear trend of outflow, over a
The Basel III agreement presupposes a higher amount of capital, the lower the returns (Mishkin, 2010). As for the
the implementation of the Third Basel Accord is brought into question. However, considering that the
either proposed nor adopted the banking standards of Basel II yet it is not logical to implement the derived
in a timely manner (Šalić, 2013) or, it is a relationship of dependency and a combination of
Basel III defines liquidity as the ability of banks to finance an increase in assets and fulfill their liability obligations on due date without making unnecessary losses, while the liquidity position presupposes a solvent assets-obligations ratio, or the expected cash inflow and outflow, over a certain period of time (Basel, 2010). Otherwise, the resulting liquidity risk which may be said to represent a current or future threat to profit or capital, stemming from a bank’s inability to fulfill its obligations on due date (Šalić, 2012). Some phenomena that have always attracted the attention of both theorists and researchers, and also of those who deal with them on a daily basis, i.e. individuals and decision-makers, which means the management of both small and big economic and non-economic legal entities. So, all the aforementioned forms of social organization are in either one or the other state, i.e. either solvent or insolvent. However, economists use the term liquidity (solvency) mostly to describe the ease with which an asset may be transformed into a medium of exchange (Mankiw, 2005), and they express it through ratios (Lat. racionalis), which express in numerical terms the interdependence of two or more phenomena (Peterson, 1994). However, if an individual or a company does not have or cannot establish a balance between payment obligations and their affordability, which is to say, if payment obligations are higher than the funds available for their payment, there appears a problem, or the state of illiquidity (insolvency). Thus, insolvent can be defined as a hiatus in asset circulation in the process of a company’s reproduction (business insolvency), or the impossibility of a free flow of the essential factors of the business process and their transformation from monetary into material forms, and vice versa, whereas liquidity presupposes unconditional fulfilment of due payment obligations over a particular period of time, or the ability of a corporation to meet its short-term financial obligations in a timely manner (Šalić, 2013) or, it is a relationship of dependency and a combination of short-term forms of capital and assets in which the short-term money engaged (Tintor, 2009).

4 LIQUIDITY AND LIQUIDITY RISK

A special segment of the Third Basel Accord deals with liquidity measurement in commercial banks. Liquidity and insolvency are terms and

In Bosnia and Herzegovina, work still goes on, with the help of USAID and within the framework of the PARE program (Partnership for the Advancing Reforms in the Economy), on drawing up and adopting the regulations pertaining to the implementation of the Second Basel Accord.

6 In Bosnia and Herzegovina, work still goes on, with the help of USAID and within the framework of the PARE program (Partnership for the Advancing Reforms in the Economy), on drawing up and adopting the regulations...
According to Matz, there are three basic forms of liquidity risk. These are: uncoordinated liquidity risk, increased liquidity risk and market liquidity risk. An uncoordinated liquidity risk occurs due to a lack of coordination between the assets and the liabilities of a bank, when the bank should manage the liquidity risk through a policy of balancing the due date balance structure and a regular monitoring of the dynamics of due dates of deposits and investments, and also by monitoring, analyzing and reporting on the state of obligations and receivables on a daily basis. An increased liquidity risk is a risk which appears due to a need for higher amounts of liquid funds which banks could encounter in the future. A market liquidity risk appears due to a potentially weaker liquidity of the financial market, which has as its consequence the impossibility of selling or purchasing liquid assets (Matz, 2001).

The degree of liquidity risk depends on the concrete position of a bank on the financial market, so that the same liquidity position of a bank may be satisfactory in one situation and inadequate in another. For this reason, a bank has to examine the influence of potentially stressful situations on its liquidity (deposit outflow, illiquidity of great debtors, etc.). The Third Basel Accord prescribes the standards which banks should observe when dealing with liquidity and liquidity risk, as well as the contents and form of the model of calculation and reporting on the liquidity ratio, all for the purpose of measuring and monitoring a bank’s liquidity position. According to this agreement, there are two chief requirements: qualitative and quantitative ones.

4.1 Qualitative requirements

Qualitative requirements are listed in “The Principles of Liquidity Risk Management”, dating from September 2008, published by the Basel Committee for Banking Supervision as guidelines for establishing a common framework for liquidity risk management on the international level (Basel Committee for Banking Supervision, 2008). According to this document, banks should establish a robust framework for liquidity risk management in order to secure the maintenance of a satisfactory level of liquidity, including the reserves of unrestricted high-quality liquid assets, so that they could withstand a series of stressful events, including a loss or damage of both secured and unsecured funding sources.

Apart from the prescribed standards and tools, this framework should also include:

- the Supervisory Board criteria pertaining to a clearly specified level of liquidity risk tolerance (limits and minimums), in accordance with an appropriate business strategy and the role of a bank in the financial system,
- creating a strategy, policy and practice for a bank’s liquidity risk management, in accordance with the established risk tolerance, i.e. this framework should define:
  - a financial strategy which will enable an effective diversification of the financial sources of a bank and their financing deadlines,
  - an algorithm of strategy implementation, with a constant presence on selected financial markets, and maintaining strong relations with the fund sources for the purpose of their diversification,
  - an algorithm of regular measurement of one’s own financial potential, for the purpose of quick fundraising from all sources,
  - an algorithm of identifying the main factors influencing a bank’s ability to acquire new sources of funds for the purpose of securing their validity and success,
- data review and regular reports submitted by a bank’s management to its supervisory board,
- control and approval of the strategy, policies, and practice pertaining to liquidity management, at least once a year by a bank’s Supervisory Board,
- calculation of the expenses, compensations and liquidity risks of a bank, and their inclusion in the internal pricing and output measurement for the purpose of approving
place of new products for all significant business activities,
– all quality procedures of identification, monitoring and control of the liquidity risk, with a projection of the corresponding, all-inclusive framework of cash flows originating, from the balance and out-of-balance positions over a period of time,
– active monitoring and control of a bank’s exposure to the liquidity risk, and of the need for fund sources among legal entities and financial institutions, taking into consideration the legal, regulatory and operative limitations of the possible transferability of liquidity,
– active management of the positions and liquidity risks of a bank during a single day, for the purpose of settling its obligations by due dates in all situations (both normal and stressful), so that it could contribute to an unimpeded functioning of the payment operations system,
– management of a bank’s collateral positions by making a classification of encumbered and unencumbered assets,
– timely monitoring of the physical locations of legal entities with a collateral on offer,
– regular testing of a bank for stress situations, with short-term and long-term possible scenarios together, identifying sources of potential liquidity deformations, and also for the purpose of securing that the existing level of a bank’s exposure to risk remains in keeping with the established internal level of liquidity risk tolerance,
– use of stress testing results for the purpose of constant readjustment of a bank’s strategy of liquidity risk management, as well as designing efficient plans for dealing with unforeseen situations, having an official plan for financing unforeseen situations, with a clearly defined strategy for dealing with liquidity shortage in critical situations,
– maintenance of bank reserves unencumbered with high-quality assets, which will be held as insurance against a number of liquidity-related stress scenarios, including those pertaining to loss or damage of unsecured and normally available secured fund sources, and that there should be no legal, regulatory or operative obstacle to using these assets for the purpose of obtaining funds,
– that a bank should publicly and regularly publish information about the validity of its liquidity risk management framework and liquidity position.

4.2 QUANTITATIVE REQUIREMENTS

The basic role of quantitative liquidity requirements is an attempt to surpass and eliminate the drawbacks identified during the last economic crisis in the financial sectors of many countries (2007-2008), for the purpose of harmonizing the measurement model and liquidity risk management. What this is all about is, actually, an accounting-based assessment of the risks of liquidity and failure to fulfill financial obligations on due date (Damodaran, 2007).

According to this request, banks should periodically:
– determine their liquidity positions according to the methodology prescribed for each ratio and monitoring tool. The basic prescribed liquidity ratios are:
  - LCR – the Liquidity Coverage Ratio,
  - NSFR – the Net Stability Financial Ratio
– measure and monitor their liquidity positions by employing the following methods:
  - analysis of contractual maturity mismatch,
  - analysis of concentration of funds,
  - analysis of available unencumbered assets,
  - analysis of liquidity coverage ratios in all relevant currencies,
  - analysis of stress tests
– adopt minimum requirements for risk management, as well as additional standards and tools for determining and managing the liquidity risk which are suitable for the scope and complexity of their activities,
– design, adopt, and maintain models for planning and maintaining an adequate level of liquidity, which should be consistent with the

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7 The quantitative requirements are prescribed in Basel III: The International Framework for Liquidity Risk Management, Standards and Monitoring, published by the Basel Committee on Banking Supervision in December 2010.
When determining LCR, each bank must determine its short-term liquidity position by way of calculations which should secure that the bank maintains an adequate level of unencumbered, high-quality assets that can be converted into cash to meet the liquidity requirements within a period of thirty days; the ratio value cannot be less than 100%, and it must be met continually on a consolidated basis; identify mismatches within the span of thirty days and secure fund sources sufficient for filling the gaps within that period; determine the ratios on a daily basis and report the results in a prescribed way. LCR constitutes high-quality assets which every bank should have, and which should cover the total net cash outflow during a thirty-day period according to the prescribed stress scenario. In order to be qualified as high-quality, those assets have to be liquid⁸ during the stress period. They are classified into Level 1 Assets and Level 2 Assets, according to their characteristics.

**Level 1 Assets** should comprise: cash, central bank reserves which can be withdrawn in a stress situation, marketable securities (issued by states and central banks) whose credit risk is assigned the weight of “0%” according to the Standardized Approach of Basel II Standard (Bazelski odbor za nadzor banaka, 2004), marketable debtors’ securities whose weight is higher than “0%” if issued by the state or the central bank in a country in which there is a reaction to liquidity risk, and marketable debtors’ securities whose weight in higher than “0%” if issued by the state or the central bank in a foreign currency.

**Level 2 Assets** should be diversified according to several criteria (issuers, participants, types), and cannot exceed 40% of the total value of high-quality assets after a discount rate of at least 15% has been taken off the current market value; what it boils down to are marketable securities and corporate bonds.

Marketable securities are receivables due to the state, or securities that the state guarantees for, as well as receivables due from central banks, on the condition that they are assigned the weight risk of 20% according to the Standardized Approach of the Basel II standards for credit risk, that they can be traded on big and active repo or cash markets with a low level of concentration, that there exist attested records testifying that those securities are a reliable source of liquidity on the market and under stressful conditions on the market during a period of thirty days, that those securities are not a liability of the bank selling them or of any of its related sections.

Corporate and covered bonds have to meet the following requirements: that they were not issued by a bank or any of its related sections; that they were not issued by any financial institution or any of its related sections; that these assets have a credit rating attested to by a reputable external institution dealing with credit estimates (the rating must be at least AA), or that it does not have a credit appraisal attested by a reputable agency, but is internally ranked in such a way that it is comparable with the aforementioned rating system; that these securities are used to trade on large and deep cash markets with a low level of

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⁸This means that it can easily and quickly be sold or bought, cashed in or marketed on the financial market.
concentration, and that there are attested records testifying that those securities are a reliable source of liquidity on the markets and under stressful conditions on the market during a period of thirty days.

The total outflow of net monetary funds is the sum total of expected outflow, reduced by the sum total of expected inflow of those funds in a stress scenario, for the next thirty days, and it is calculated by multiplying its liability balance by the rates or assigned weights according to which they are expected to expire or be withdrawn during the stress period. The total expected inflow of monetary funds is calculated by multiplying the remaining assets balance or contracted receivables by the rates or weights according to which they are expected to become due, according to the scenario of the aggregate amount of 75% out of the total expected cash outflow.

4.2.2 The net stability financial ratio (NSFR)

The net stability financial ratio (NSFR) represents a supplement to LCR and a promoter of structural changes in banks’ risk liquidity profiles, from short-term financial discrepancies toward a more stable, long-term financing of assets and business activities. It is calculated by dividing the available stable funds by the value required for stable financing over a period of one year. This ratio has to be greater than 100%, i.e. the available stable funds have to be higher at all times than the required stable funds, and it is every bank’s obligation to calculate it at least once a month and report the results to the supervisors, which is to say:

\[
NSFR = \frac{\text{Available stable funds}}{\text{Required stable funds}} > 100\% \quad (2)
\]

Stable sources of funding are made up of the stockholders’ capital and those obligations which are supposed to be reliable sources of funds over a one-year period under the conditions of prolonged stress. The required stable funds comprise cash unencumbered as a collateral, as well as unencumbered short-term securities, repo instruments, loans given to banks and other financial institutions with maturity periods of less than a year, securities with residual maturity periods of one year or exceeding one year (in the case of claims from governments and central banks), corporate bonds with the AA rating, other securities with a credit weight of 20%, gold, etc.

4.3 Liquidity risk monitoring tools

Monitoring tools, or monitoring procedures, constitute models and forms of measurement and monitoring liquidity risks which every bank should employ to manage its liquidity positions in accordance with them. Those forms of measurement and liquidity risk monitoring can be expressed through analyses of: contractual maturity mismatch, the concentration of funds, the available unencumbered assets, liquidity coverage ratios and through stress tests.

The purpose of analyzing contractual maturity mismatch is to identify the gaps between the contracted inflow and outflow of liquidity over specific time intervals, by way of which it is learned how many additional fund sources a bank needs to have in each of these intervals, in case the funds outflow happens in the earliest possible way. This analysis is conducted for all currencies in which a bank has a significant exposure. An analysis of the concentration of funds should indicate the way in which a diversification of depositors and other external fund sources should be made in order to reduce dependence on a single source or a small group of sources for those funds. The concentration of funds is considered to be the amount of funds in the domicile currency from any single source or a group of related sources which includes more than 1% of the total balance sheet of a bank, while that value for a foreign currency amounts to 5%. The goal of this type of analysis is to identify any significant reliance on funds that would create problems for a bank’s liquidity if they were withdrawn.

The available unencumbered assets are those which are marketable as a collateral on secondary markets, and are used for settling a potential lack of liquidity in the immediate future. These assets must not be deposited, but must be freed from all restrictions concerning their use by a bank.

An LCR analysis is an analysis for each currency in which a bank has such a level of exposure that one could identify a potential currency mismatch which may not be evident while calculating its global LCR.

In the process of planning for unexpected situations, banks should prepare for liquidity management in stressful situations. The methodology for calculating LCR and NSFR is based on a stress scenario for the purpose of
harmonizing the liquidity risk measurements according to international practice. Creating alternate scenarios is an obligation of each bank and primarily depends upon a bank’s own profile of liquidity risk. In that sense, banks should periodically test alternate scenarios and estimate their influence on the cash flow by using reasonable assumptions related to market liquidity factors and internal financing factors. It is a bank’s obligation to present the results of stress tests to supervisors and get an opinion from them, especially in a situation when there is a liquidity-related problem, as the responsibility for a bank’s liquidity lies primarily with the bank’s management, because the management governs the bank and has the obligation to keep it safe from stresses, by which it also protects, first of all, the bank’s depositors, as well as the stockholders.

5 DETERMINING LCR IN A BANK IN BOSNIA AND HERZEGOVINA

Regardless of the fact that the banking system of Bosnia and Herzegovina at present is nowhere near to adopting the regulations of the Third Basel Accord, due to its great significance and frequent use, an LCR test was conducted for a commercial bank in Bosnia and Herzegovina, over different time periods and according to different calculation models, i.e. according to the Basel III standards and according to the regulations of the regulatory organs of Bosnia and Herzegovina. Before arriving at the precise value of LCR, it is necessary to determine its harmonized values, which are calculated by multiplying the corresponding balance sheet positions by weights, whose minimum values are set by regulations, and regulatory organs may increase or decrease these minimum values in keeping with their safety estimate and according to the degree of probability of its happening.

Tables 2, 3, 4 and 5 show what happens with LCR when the results of a single bank are observed over two different periods of time. These are accounting values which, “looking backward”, represent indicators of value based on previous formation and spending of assets (Brealey, 2009). From Table 1, it is evident that the balance of high-quality cash of the bank under observation is significantly lower in the second period observed, and that this reduction was particularly due to a decrease of that bank’s reserves in the Central Bank. The aforementioned data were deliberately taken from the middle of one and almost from the middle of another business year (30th June 2011 and 31st August 2012 respectively)\(^9\), so that there should not be any doubt concerning the validity of the data, because if the data had been taken from the middle of one and the end of another year, they would not have been comparable. Why is that so?

Because each bank pursues different credit and liquidity policies during these periods: the accounts are settled at the end of a year, when most banks tend to get rid of their cash, transforming it mostly into loans and partly into securities, thus increasing their income, so that the final financial report should be as good as possible and the profitability rates (ROE; ROA) realized at the highest level possible. It is also evident that, in our circumstances, there are no Level 2 Assets and that the sum total of highly-liquid assets is actually Level 1 Assets. But regardless of the lower balance of assets from the second year in comparison to the first one, the funds outflow is almost the same in the second year, or merely 2% higher than in the previous year (Table 2). This means that the bank’s funds outflow is the more uniform, constant, obligatory and certain portion of its total monetary flow, and that practically the value of the liquidity ratio depends more on the inflow than on the outflow. Why is that so?

Because all deposits, except a vista deposits, have their own maturity periods, i.e. deadlines by which they must be repaid, or in stock, or in the clients’ accounts on a precisely stipulated date. The very fact that the inflow balance is lower, and that the outflow balance remained virtually the same, shows that the liquidity ratio will also be lower in the second than in the first period. However, it is first necessary to establish another element of determining liquidity according to the Thirds Basel Accord, and that is determining the inflow of the other side.

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\(^9\) Data from the analytical records of a medium-sized B&H bank and a report from The Banking Agency of Bosnia and Herzegovina.
### Table 2: Determining high-quality liquid assets according to Basel III

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<td>Result BS</td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>Other</td>
<td>100 153</td>
<td>100 52</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>TOTAL LEVEL 1</td>
<td>159.386</td>
<td>159.386</td>
<td>81.283</td>
</tr>
<tr>
<td>II</td>
<td>LEVEL 2 ASSETS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Claims from the government and public Co, with p= 20% SA Basel II</td>
<td>85</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Corporative bonds AA and &gt;</td>
<td>85</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Co covered bonds AA and &gt;</td>
<td>85</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>TOTAL LEVEL 2</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>TOTAL LIQUID ASSETS</td>
<td>159.386</td>
<td>159.386</td>
<td>81.283</td>
</tr>
<tr>
<td>IV</td>
<td>40% Liquid assets</td>
<td>40 63.754</td>
<td>40 32.513</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3: Determining fund outflow according to Basel III

<table>
<thead>
<tr>
<th>No.</th>
<th>DESCRIPTION</th>
<th>30.06.2011.</th>
<th>31.07.2012.</th>
<th>Index 12/11</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Weight BS</td>
<td>Result BS</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>RETAIL DEPOSITS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Deposits up to 30 days</td>
<td>95.288</td>
<td>5.277</td>
<td>112.394</td>
</tr>
<tr>
<td>1.1</td>
<td>Secured transactional accounts</td>
<td>5</td>
<td>78.36</td>
<td>3.918</td>
</tr>
<tr>
<td>1.2</td>
<td>Deposits up to 35.000 KM</td>
<td>5</td>
<td>6.671</td>
<td>333</td>
</tr>
<tr>
<td>1.3</td>
<td>other, foreign currency – time deposit</td>
<td>10</td>
<td>3.437</td>
<td>344</td>
</tr>
<tr>
<td>1.4</td>
<td>Unsecured transactional accounts</td>
<td>10</td>
<td>6.814</td>
<td>682</td>
</tr>
<tr>
<td>2</td>
<td>Time deposits &gt; 30 days</td>
<td>0</td>
<td>64.92</td>
<td>5</td>
</tr>
<tr>
<td>II</td>
<td>UNSECURED FUNDS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Stable small clients</td>
<td>5</td>
<td>5.000</td>
<td>250</td>
</tr>
<tr>
<td>2</td>
<td>Less stable small clients</td>
<td>10</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>
Therefore, it is a matter of determining inflow on the basis of repo transactions and other inflow from a partner side (Table 3), which acts as a correction of the already established outflow from the previous table. Actually, it is a matter of offsetting the outflow against the inflow of the other side, thus arriving at the category of net outflow, which represents a position with which the inflow from the periods observed is compared.

Table 4: Inflow of the other side according to Basel III

<table>
<thead>
<tr>
<th>No.</th>
<th>Determining Inflow from the Other Side (in 000 KM)</th>
<th>30.06.2011.</th>
<th>31.07.2012.</th>
<th>Index 12/11</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O P I S</td>
<td>Weight BS</td>
<td>Result</td>
<td>Weight BS</td>
</tr>
<tr>
<td>1</td>
<td>Inverse repo transactions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Level 1 Assets</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Level 2 Assets</td>
<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>All other assets</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Credit /liquidity instruments</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Deposits in other financial institutions</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Deposits in the Central Bank</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
Finally, LCR is determined by relating the highly liquid inflow from Table A to the net outflow from Table D, for the periods observed:

The liquidity coverage ratio (LCR) was significantly higher in the earlier period observed than in the later one (Table 6); more precisely, in the second period (August 31st, 2012) it was lower by 37.5% and therefore negative, which means that the bank was illiquid in the second liquidity measurement thirty-day period. This means that it is not or will not be able to settle all its short-term obligations, i.e. that the bank will not be able to fully cover its obligations pertaining either to the citizens’ deposits of up to 30 days, or the unsecured obligations, secured financing, or some additional requirements which constitute obligations on the basis of: derivatives, credit instruments, guarantees and letters of credit.

### Table 6: The Liquidity Coverage Ratio according to Basel III – LCR

<table>
<thead>
<tr>
<th>No.</th>
<th>DESCRIPTION</th>
<th>30.06.2011.</th>
<th>31.07.2012.</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LCR = A / D</td>
<td>144%</td>
<td>90%</td>
<td>62.5</td>
</tr>
</tbody>
</table>

## 6 ANALYSIS OF SIMILARITIES AND DIFFERENCES IN MEASURING THE LIQUIDITY RATIO

Measuring liquidity up to 30 days according to the regulations passed by the Banking Agency of Bosnia and Herzegovina, we find in our example that the bank is liquid in both periods (Table 7).
By up to 22% in the first and 14% in the other period observed, the bank had more short-term assets than short-term liabilities, meaning that it was highly liquid, and therefore far from illiquidity. According to the criteria provided by the Banking Agency, the liquid level of assets is also lower in the second period observed than in the first one; however, the bank was not illiquid but liquid in both cases. It is obvious that there are differences in the way of determining the degree of liquidity between the models currently used by the Banking Agency and the ones suggested by the Third Basel Accord. However, the question for the beneficiaries of these models is which model is more correct, or to be more precise, which one is more useful with regard to protection against illiquidity?

In order to answer the previous question, we will conduct a short analysis of both models with the help of Table 8.

As is clearly visible, when one analyzes all the previous tables, one can conclude that the model of the Third Basel Accord is wider and more encompassing because, unlike the one used by the Banking Agency, it:

- deals with more positions in assets and with higher weight-risks (100), meaning that the numerator in the formula is always higher (it also covers various claims), and with greater chances of achieving a higher liquidity ratio,
- also includes more positions in liabilities with lower and higher weight-risks, but in the positions which are significant for the final outcome of the liquidity ratio (transactional deposits); weight-risks are maximum (100), so

### Table 8: Similarities and differences between the models for establishing liquidity

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>AGENCY</th>
<th>BASEL III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets coverage</td>
<td>lower</td>
<td>higher</td>
</tr>
<tr>
<td>Assets weight-risk</td>
<td>lower</td>
<td>higher</td>
</tr>
<tr>
<td>Liability coverage</td>
<td>lower</td>
<td>higher</td>
</tr>
<tr>
<td>Liability weight-risk</td>
<td>lower and higher</td>
<td>lower and higher</td>
</tr>
<tr>
<td>Out-balance coverage</td>
<td>-</td>
<td>higher</td>
</tr>
</tbody>
</table>
that the chances for achieving a lower liquidity ratio are higher,

- includes also the out-balance positions, especially those of issued guarantees and opened letters of credit which can easily be transformed into obligations, and then into outflow of financial funds for the bank,
- the ratio of the liquid assets and the total projected net cash outflow within the period of 30 calendar days must be higher than 100%, and
- if the bank is liquid according to the old system of liquidity settlement, according to the Third Basel Accord it is illiquid.

Thus, the answer to the previous question, that of which model is more suitable and useful for banks, is that it is the model of the Third Basel Accord, because it includes a lot more details in the sense of forming both the current assets and the current liabilities, which is to say, it includes a lot more positions of the actual balance sheet, as well as all the significant positions of the out-balance records, which can be easily transformed into bank obligations (protests of issued guarantees, etc.). It is probable that some of the banks in Bosnia and Herzegovina will not be able to meet the new requirement for the necessary liquidity level, and that those banks which will not be able to fulfill the aforementioned conditions will have to seek other solutions in order to be able to both formally and essentially meet the requirements for the necessary liquidity level. Actually, what a majority of banks have to do is to increase their capital, which will create conditions for increasing deposits, which, in turn, will enable them to achieve a satisfactory liquidity coverage ratio. Why is that so? “Because capital is the measuring standard for each further total growth of a bank’s property and all future positive results with regard to income, gain and overall welfare. In fact, the adequacy rate of capital is that standard, or the indicator telling banks what to do and at what particular moment they need to do it. Major and large banks in Bosnia and Herzegovina today need capital because their adequacy capital rates are low (close to 12%), and if the economic crisis, which is evident, especially in these areas, continues, the classification of banks’ assets will keep worsening, as will the financial results, which is to say, there will be losses which many banks will not be able to cover with the results of the current year. The losses will be offset at the expense of a bank’s capital, which will, as a result, reduce and diminish its participation in the risk assets to the level which will not satisfy the standards set by the regulations provided by the regulatory organs. The total assets of the banks in Bosnia and Herzegovina have been at the same stagnant level over the last few years. By Balkan standards, it is low; by European standards, it is even more so. Therefore, the banking system’s assets have to be increased in every way possible” (Šalić, 2012, pp. 50-62).

7 CONCLUSION

In attempting to absorb the shock waves produced by financial and economic stresses, the new banking standards require a greater amount of and higher-quality capital, as well as better and higher-quality liquidity risk coverage. The new standards in capital and liquidity measurement are much more detailed than the existing ones, because they deal with more balance and out-balance positions of banks, despite being primarily intended for major banks. The banking system of Bosnia and Herzegovina does not have major banks, and is lags behind when it comes to the implementation of these standards, but that does not mean that it should not implement them. However, first the standards of the Second Basel Accord need to be adopted and implemented, because the new standards stem directly from those. Our research has shown that the majority of banks in Bosnia and Herzegovina will be able to fit into the new framework, but also that small banks, as well as those with a low capital level, will not be able to fulfill any of the given requirements for those standards unless they improve, which is to say, unless they improve their operating level in every way possible.

WORKS CITED


