

LIQUIDITY STRESS TESTING

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Abstract. After the deep crisis of 2007 and the banks-bankruptcy in Ukraine in 2015, the urgent issue is the timely detection of illiquid banking institutions, banks with a problem of lack of liquidity. The purpose of this work is to show the need for each banking institution to apply a liquidity stress test and its methodology.

Анотація. Після глибокої кризи 2007 року та банкопаду в Україні у 2015 році нагальним питанням є своєчасне виявлення неліквідних банківських установ, банків з проблемою нестачі ліквідності. Мета цієї роботи - показати потребу кожної банківської установи застосовувати стрес-тест ліквідності та його методологія.

Аннотация. После глубокого кризиса 2007 года и банкопада в Украине в 2015 году актуальной проблемой является своевременное выявление неликвидных банковских учреждений, банков с проблемой нехватки ликвидности. Цель данной работы - показать необходимость для каждого банковского учреждения применять стресс-тест ликвидности и его методология.

The 2007 global financial crisis highlighted the need to proactively manage and monitor bank solvency at an enterprise level by demonstrating the interconnectedness of liquidity risk with both financial and non-financial risks. That interconnectedness was clearly shown through the linkage of the credit quality of US subprime mortgages to the credit quality of many types of structured credit assets to the funding problems of structured investment vehicles – which led to liquidity and solvency difficulties at banks.

Today, such a tool for identifying banking risks as a stress test has become popular. A stress test is an analysis designed to determine whether a bank has sufficient capital to withstand the effects of adverse economic changes conducted under hypothetically unfavorable economic scenarios, such as a deep recession or financial crisis.

According to the definition given by the Basel Committee, stress testing is intended to give an idea of the available adverse scenarios associated with various risks and the amount of capital required to absorb losses in the event of a shock scenario.

Liquidity stress test aims to measure the level of liquidity the institution must maintain to ensure a continuous ability to meet financial obligations in stressed conditions. A useful liquidity framework starts with defining “liquidity” for liquidity stress testing purposes. For this context, liquidity refers to funding liquidity risk, which is the risk that the institution is unable to fund its obligations without suffering unacceptable economic losses. Asset liquidity risk, which involves an institution incurring losses due to the difficulty of converting assets into cash, should further be considered as it has an impact on the level of funding created from the sale of assets.

For Stress Test of the Liquidity Risk, the Bank assess the following risk factors: asset quality deterioration, increase of funds concentration, outflows of funds from retail and corporate accounts, decrease of High quality liquid assets (HQLA) value, liquidity crisis on the market, decrease of possibility to attract funds etc. For liquidity stress test, the Bank applies its own statistic, banking system statistic during crisis period and other available information.

For defining of Stress scenarios, the Bank considers the following types of liquidity crisis:

- Bank`s specific crisis: assets deterioration, outflows of clients funds, decrease of HQLA value etc.;
 - Market related crisis: decrease possibility to attract funds on a market and increase of funding cost;
 - Combined crisis includes both Bank`s specific crisis and Market related crisis.
- Impact of all types of crisis defined at the table 1 below for each scenario.

Table 1. Impact of all types of crisis for each scenario

№	Assumptions	Stress scenarios		
		Slight crisis	Moderate crisis	Strong crisis
		High probability	Middle probability	Low probability
1	Decreasing of value of HQLA haircut:			
	- Government bonds	10%	15%	20%
2	Overdue loans and interest increase (loans repayment declining):			
	- “0-1 month” time bucket	10%	20%	30%
3	Run-off of retail sight/term deposits portfolio additionally to the portfolio contract withdrawals during 1 month:			
	- “0-1 month” time bucket	15%	20%	30%
4	Run-off of corporate sight/term deposits portfolio			
	- “0-1 month” time bucket	20%	30%	50%
5	Run-off of financial companies sight/term deposits portfolio			
	- “0-1 month” time bucket	30%	40%	60%
6	Committed credit lines drawdown:			
	- “0-1 month” time bucket	5%	10%	15%
7	Guarantees drawdown:			
	- “0-1 month” time bucket	5%	10%	15%
8	Increase of price for attraction of funds on the market (i)			
	- “0-1 month” time bucket	Market price+10%	Market price+20%	Market price+50%

The Bank applies all shocks to current values of LCR in all currency and LCR in foreign currencies, value of HQLA, Wholesale GAP exposure, NSFR and NBU Economic Indicators. Calculation of liquidity indicators is carried out based on Methodology defined at correspondent liquidity risk internal documents as well as NBU resolutions.

After simulation of stress liquidity indicators the Bank defines: additional funds required to align with all Liquidity Indicators and calculates its cost, Simulated Loss from Liquidity Risk (SLLR), using the potential increase of funding cost (i%) and period of attraction 3 months:

$$SLLR = \text{Required Funds} * \frac{i\%}{4}$$

Outputs from Liquidity Stress Testing:

1. Simulated Loss from Liquidity Risk (SLLR)
2. Value of HQLA
3. Value of risk indicators such as LCR, NSFR, Wholesale gap, NBU liquidity indicators

At the last stage of the stress test, measures are developed to counteract and localize negative phenomena from hypothetical to real. Such measures should be adequate to the level of risk and reduce the potential losses of the bank. This is especially important when developing measures to minimize liquidity risk, which in a matter of days can lead to huge losses and losses of capital and shocks in the banking system. Accordingly, the national regulator must test the banking sector for credit, market and liquidity risks.

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