MARKET RISKS IN COMMERCIAL BANKS: METHODS OF ASSESSMENT AND ANALYSIS

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Paragraph 2 of the Regulation "On minimum requirements for the management of banking risks of commercial banks", registered by the Central Bank of the Republic of Uzbekistan on May 25, 2011, No. 2229 described:

Market risk is the risk of loss (loss) or failure to receive planned gains due to negative changes in the price of bank assets and liabilities (including off-balance sheet) due to changes in market interest rates, exchange rates, stock prices and commodity prices described as [1].

Market risk consists of the following types of risk:

Interest rate risk. Interest rate risk is the risk of a change in the price of bank assets and liabilities (including off-balance sheet) due to changes in interest rates (for example, the absolute level of interest rates, rates between two spreads, the yield curve). is the risk of loss (loss) or failure to receive planned earnings.

Currency risk. Currency risk can be tariffed as follows: Currency risk is the risk of loss (loss) or loss of planned income due to changes in the bank's foreign currency balance and off-balance sheet positions as a result of changes in foreign exchange rates.

Fund risk. Fund risk is a type of risk that is the third and final component of market risk and is the risk of loss (loss) or failure to obtain planned gains as a result of adverse changes in market prices of instruments in the securities portfolio. type.

The most important task of market risk management is not to completely "avoid" risk (which is not possible in practice), but to find the optimal balance between profit, risk and liquidity. In this case, the main reference point should be the ratio between market risk and bank capital. The International Committee on Banking Supervision, in its report "International Harmonization of Capital Measurements and Standards" (Basel Capital Agreement of 1988), notes that regulators regularly take market risks into account when calculating total capital adequacy [2] .

Market risk management has a specific purpose, which is to maintain a certain level of risk that the bank assumes, which is determined in accordance with the strategic objectives set by the bank's mission.

At the same time, the specific features of market risks are the interdependence of its elements, which can be useful in the selection of methods for assessing and managing this type of risk. Although market risk is not specific to any type of transaction or service, there can be more than one type of market risk in one instrument, i.e., their comprehensive coverage should be considered in the process of studying market risks.

The range of market risk factors is very large. These include: unfavorable changes in interest rates, changes in the market value of financial instruments, changes in exchange rates, and so on. A common feature of transactions that are exposed to market risk is the type of income from which the transactions are made. Market risk operations are carried out for the purpose of obtaining speculative income. Unlike fixed income, this feature of income is a key feature of the transactions being analyzed.

The standard approach used in calculations is based on strict calculations and is widely used in practice by banks. In addition, this methodology uses a principle that provides for a separate assessment of specific and overall market

risk. Specific market risk is the risk of losses resulting from changes in the price of a particular financial instrument, including the risk of an event and the risk of default by the issuer. The overall market risk stems from fluctuations in the financial market in general and reflects changes in portfolio value as the sole tool.

According to the standard approach recommended by the Central Bank of Uzbekistan and the Basel Committee, changes in the value of the bank's economic capital are assessed mainly on the basis of the activities of large banks and small banks. Most banks operate on a short forecast horizon when assessing interest rate risk in terms of liquidity risk. Small banks usually manage interest rate risk for up to 1 year, medium banks - for 2-3 years, large banks - for 3-5 years. This has several explanations. The timing of the bank's assets and liabilities and the focus on variability in interest income depend on the size of the bank's capital. Small banks, as a rule, do not face difficulties in actively managing the balance sheet structure through a pricing tool, as they follow the price of banking products set by large market participants. In addition, they have less analytical resources to forecast interest rate dynamics.

There are many ways to estimate potential losses on financial instruments and portfolios, the main ones being:

a) VaR - (Value at Risk)

b) Shortfall. Analytical approach (e.g. delta-gamma approach).

c) Stress Testing (new methodology).

In this article, we will look in detail at the most common first method - VaR, which is to estimate the value expressed in monetary units of the base currency that does not exceed the expected losses over a given period of time (time). The basis for evaluating VaR is market rates and price dynamics for a given period of time in the past. The time horizon is mainly chosen based on the maturity of the financial instrument in the portfolio or its liquidity, the minimum real period during which the instrument can be sold in the market without significant losses. The time horizon is measured on business or trading days. The level of confidence or probability is selected depending on the risk preferences expressed in the regulatory documents of the bank. Typically, 95% or 99% is widely used in practice. The Basel Committee on Banking Supervision recommends the use of the 99% rate targeted by regulators [3].

VaR is calculated using three main methods:

a) parametric;

b) by the method of historical modeling;

c) by the Monte Carlo method.

Below we discuss these methods in more detail.

Parametric method of calculating VaR.

This method is used to assess the market risk of financial instruments in which the bank has an open position. It should be noted that the parametric method is not suitable for assessing the risk of assets with nonlinear price characteristics. The main disadvantage of this method is that it assumes the normal distribution of income on financial instruments, which in general does not correspond to the parameters of the real financial market. For the parametric calculation of VaR, it is necessary to constantly calculate the variability of stock quotes, exchange rates, interest rates or other risk factors.

The basic formula for determining VaR, taking into account the value of the active position, is as follows:

$VaR = V * l * s$

where: l is the quantile of the normal distribution for the selected confidence level.

Quantil represents the position of the desired value of a random variable relative to the average expressed in the number of standard deviations of portfolio income. Quantum of normal distribution with a probability of deviation of 99% on average 2,326, 95% - 1,645;

s is the variability of the risk factor change.

Variability is the standard (root-mean-square) deviation of the change in the risk factor relative to the previous value;

V is the current value of the open position.

A historical modeling method for calculating VaR.

This method is related to the assumption that there is a steady state in market price behavior in the near future. Initially, a period of time (number of business or trading days) in which the historical value of all assets included in the portfolio changes is selected. Each period creates its own price change models. The hypothetical price of an asset is calculated as its current price and the price increase corresponding to a particular scenario. In the next stage, a complete revaluation of the entire current portfolio is carried out at prices modeled on the basis of historical scenarios, and the current portfolio value for each scenario is calculated by how many points it can change. The results are then sorted in descending order (from maximum gain to maximum loss). Finally, according to the required level of confidence, the VaR value is defined as the maximum loss equal to the absolute value of the change equal to the whole part of the number.

Unlike the first method discussed above, the historical modeling method provides a complete visual assessment of risk, which is sufficient to assess the risk of assets with nonlinear price characteristics. The advantage of this method is that it eliminates the high impact of model risk.

Monte Carlo method for calculating VaR.

The Monte Carlo method, or in other words, the stochastic modeling method, is the most complex method of calculating VaR, ensuring its high accuracy compared to other methods. The Monte Carlo method is very similar to the historical modeling method based only on changes in asset prices with given distribution parameters (mathematical

expectation, variability). The Monte Carlo method is based on performing a large number of tests. As a result of these tests, a distribution of possible financial results is obtained, on the basis of which a VaR-estimate can be obtained by cutting the worst of the selected confidence intervals.

The method is that mathematical expectation and estimation of variability are calculated based on retrospective data (time period). Using a random number generator, the data is generated using a normal distribution and entered into a table. In the next step, the price trajectory simulated using the natural logarithm formula is calculated and the portfolio value is revalued. Since VaR Monte Carlo evaluation is almost always done using software, these models can be very complex subprogrammes.

This method can be used to model the behavior of markets - trends, high or low volatility clusters, variable correlations between risk factors, and so on. This method requires large computing resources and can be close to historical or parametric VaR in the simplest implementation, which leads to inheriting all their shortcomings [4].

The relationship between changes in the prices of different instruments does not directly affect the price factor, but indirectly affects the price characteristics of the portfolio that includes these instruments. Similarly, the variability of a particular instrument has a significant effect on the option price of that instrument, even if it is not a price indicator in itself. Turning to risk management in the Uzbek banking system, we can say that in the early days of the banking and financial sector, the risk of losses due to default by counterparties, ie credit risk, was a key issue. The development of the financial sector with a focus on Western standards has led to a shift in priorities.

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