AMERICAN JOURNAL OF ECONOMICS AND BUSINESS MANAGEMENT

ISSN: 2576-5973
Vol. 4, No. 10, 2021

Assessment and Management of Interest Risks in Banks

Toshpulatov Davron Akromovich
JSC "Mortgage Refinancing Company of Uzbekistan" Risk manager

Abstract: The article describes the content of interest rate risk in commercial banks, the objectives of interest rate risk management, the causes and stages of interest rate risk management, methods of identification and assessment of interest rate risk, interest rate monitoring, the role of relevant departments in credit risk management. At the same time, the views of local and foreign scholars in the scientific literature on the assessment and management of interest rate risk in banks have been analyzed. There are also scientific suggestions and conclusions on how to reduce potential interest rate risks.

Keywords: interest rate risk, GEP, capital, earning at risk, risk appetite, stress test.

Introduction

Improving the quality of credit portfolio and risk management as a key area of banking sector reform in the Republic of Uzbekistan, pursuing a balanced macroeconomic policy with moderate growth in lending, ensuring the financial stability of the banking system through the implementation of technological solutions for the assessment of financial risks will require the development of methods and management methods to assess interest rate risk prevention in banks. [1]

In the banking practice of the Republic, variable interest rates are almost never used for deposits and loans, and even if used, they are used in very small quantities. As a result, there is a risk that commercial banks will be exposed to interest rate risk. [2]

"Is interest rate risk constant or can it be avoided?" the question arises. Theoretically possible, the risk is eliminated if the return on assets (loan interest rate) is balanced according to the term and amount of borrowed funds by terms and amounts. But in practice, not all loans can be balanced in this way at any time, and banks are not eager to pursue such a policy. That is why banks are constantly exposed to interest rate risk, which leads not to avoid interest rate risk, but to manage it. [3]

In international banking practice, interest rate risk is analyzed for the following financial instruments: debt securities; securities that have the right to be converted into debt securities; non-convertible preferred shares with a fixed dividend amount; interest-bearing financial instruments; transactions in which the relevant requirements or obligations of the bank under the terms of the agreement are calculated on the basis of interest rates. [4]

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:4 Issue: 10 in December-2021
https://www.grnjournals.us/index.php/AJEBM

Copyright (c) 2021 Author (s). This is an open-access article distributed under the terms of
Creative Commons Attribution License (CC BY).To view a copy of this license, visit https://creativecommons.org/licenses/by/4.0/

In general, one of the main risks in banking is interest rate risk, which requires a certain amount of knowledge and experience from experts in determining them, as the losses from this type of risk are not clearly visible. It therefore requires theoretical and practical scientific research on the assessment and management of interest rate risks.

ANALYSIS OF THE LITERATURE ON THE SUBJECT

Basel interest rate risk is the impact of a bank's interest rate movements on negative movements. In a bank book, interest rate risk is the risk that arises as a result of a negative change in interest rates on current or future bank capital and income. As interest rates change, the current value and timing of future cash flows change. This in turn changes the underlying value of the bank's assets, liabilities and off-balance sheet assets and therefore its economic value. Changes in interest rates affect the bank's income, which in turn affects interest income and expenses, affecting the bank's net interest income [5].

According to G. Akhmadeev and D. Shakirov, commercial banks are always exposed to interest rate risk, because it is not always possible to balance the loans provided by banks. This necessitates the improvement of interest rate risk management [6].

According to K.Kurilov and A.Kurilova, interest margin management. That is, controlling the margin between interest income on profitable assets and expenses on liabilities is one of the main objectives of interest rate risk management [7].

According to T. Makshanova, the coordination of assets and liabilities by maturity allows you to set a fixed interest rate spread. This allows you to neutralize interest rate risk [8]

Peter Rose noted that interest rate risk is high among the risks faced by commercial banks [9] because interest rate risk affects all sections of the bank's balance sheet.

The Central Bank's of Uzbekistan regulation on "requirements for Banking Risk Management by Commercial Banks" defines interest rate risk as the risk of financial loss to a bank as a result of adverse changes in interest rates on assets, liabilities and contingencies. [10]

In view of the above, we can define interest rate risk as the risk of loss (loss) or failure to receive planned income as a result of a negative change in the price of bank assets and liabilities (including off-balance sheet) due to changes in interest rates.

RESEARCH METHODOLOGY

The article focuses on the essence of credit risk, goals and objectives of interest rate risk management, causes and stages of interest rate risk management, interest rate risk assessment, prevention, assessment and analysis of general interest rate risks in accordance with the requirements set by the Central Bank and industry practices. Independent approaches to the study of the necessary features have been formed on the basis of scientific conclusions of the research work carried out by foreign and domestic scientists and the practical experience of the authors. Methods such as tables, analytical comparisons, logical analysis, grouping, and statistics were also widely used.

ANALYSIS AND RESULTS

Develop a risk management strategy in the Bank's interest rate risk management, define the level and limits of risk appetite tolerance, constantly monitor market conditions, use net interest income and limits, apply to the Bank's Management Board for approval of individual interest rate agreements or

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:4 Issue: 10 in December-2021
https://www.grnjournals.us/index.php/AJEBM

Copyright (c) 2021 Author (s). This is an open-access article distributed under the terms of
Creative Commons Attribution License (CC BY).To view a copy of this license, visit https://creativecommons.org/licenses/by/4.0/

large transactions, limits, stress-test and have an emergency planning procedure for market disruptions, as well as to ensure that information is transparent to the Management and that prudential limits are met.

Table 1: An interest rate management strategy implemented through risk appetite indicators[1]

Name	Risk strategy	Risk measurement
Earning at risk	Reducing the impact of the negative impact of interest rates on bank income to a level that corresponds to the risk appetite limit set.	Return on risk ratio (risk return and total capital)
Economic value of equity	Negative changes in interest rates reduce the impact of the rate on the economic value of the Bank's equity, which corresponds to the established risk appetite limit.	Economic value of capital and level of risk (economic value of capital and total capital)
Repricing mismatches	Maintain an optimal balance of interest rate-sensitive assets and liabilities as well as interest rate types with a fixed risk appetite.	Gap Ratio (GAP) (Gap Reduction and Total Capital)

The main methodology used by the Bank in measuring interest rate risk is to analyze the gap in the revaluation. The Bank estimates the composition of interest-bearing assets and liabilities over time and calculates disparities (GAPs) on a periodic, cumulative basis. The analysis is performed in each currency and on a consolidated basis.
In recalculating the risks, the Bank uses the results of the gap analysis to quantify the amount of income at risk and changes in the economic value of capital. This analysis is based on some assumptions that there may be static and dynamic parallel and non-parallel fluctuations in interest rates in each currency.

In calculating the risks, it is used to measure the impact of negative changes in interest rates on bank income over the next 12 months. The result can be compared with the net interest income and the Bank's capital.

The price redistribution approach in the calculation of GAPs divides assets, liabilities and off-balance sheet positions into a periodic table based on the next period of interest repayment, taking into account interest.

The following time interval is used to measure revaluation gaps: 1 month; 1-3 months; 3-6 months; 6-12 months; More than 12 months.

The following are used to determine the sensitivity of assets and liabilities for distribution:

fixed interest rate - distributed over the expected period;

floating interest rate - distributed over the next valuation period;

variable interest rate - distributed by subsequent adjustment of interest rates;

without interest rate - interest is allocated indefinitely.

[1] Prepared by the author

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:4 Issue: 10 in December-2021
https://www.grnjournals.us/index.php/AJEBM

Copyright (c) 2021 Author (s). This is an open-access article distributed under the terms of
Creative Commons Attribution License (CC BY).To view a copy of this license, visit https://creativecommons.org/licenses/by/4.0/

non-interest-bearing items include interest on non-interest-bearing assets such as bank capital, property, plant and equipment, cash, receivables or property, plant and equipment, demand deposits and interest-free liabilities such as accounts payable.

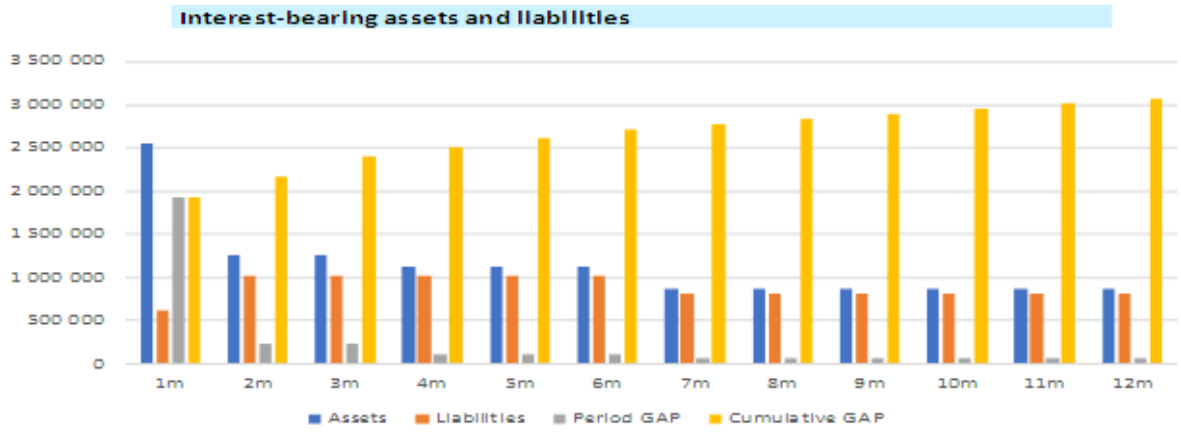
With the exception of time-sensitive assets and liabilities, all off-balance sheet positions are referred to simultaneously as a "revaluation mismatch" or "GAP". To determine the percentage in question, the amount of this difference is compared with the general condition of the capital. Percentage can be positive or negative depending on the total amount of assets relative to liabilities for the same period. GEP replenishment measures risks in each major currency on a periodic and cumulative basis. The difference in a single currency can be combined into a total position by revaluing the national currency.

The difference in revaluation is that the sensitivity to changes in interest rates is a common sign of a reduction in income:

a positive difference in the revaluation assumes that an increase in income increases interest rates during this period, or a decrease in income predicts a decrease in interest rates. The main reason for this is that the vast majority of assets in this period change relative to exchange rate sensitivity, while liabilities change relative to exchange rate sensitivity.

the negative difference in revaluation predicts a decrease in income when interest rates rise and an increase in income when interest rates fall. The main reason for this is that the greater sensitivity part of the revaluation liabilities in this period is the backward ratio of the asset rate sensitivity.

In the example of Bank A, we consider the assets and repayable liabilities of this bank that are interest-bearing in 1 year:



ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:4 Issue: 10 in December-2021
https://www.grnjournals.us/index.php/AJEBM

Copyright (c) 2021 Author (s). This is an open-access article distributed under the terms of
Creative Commons Attribution License (CC BY).To view a copy of this license,
visit https://creativecommons.org/licenses/by/4.0/

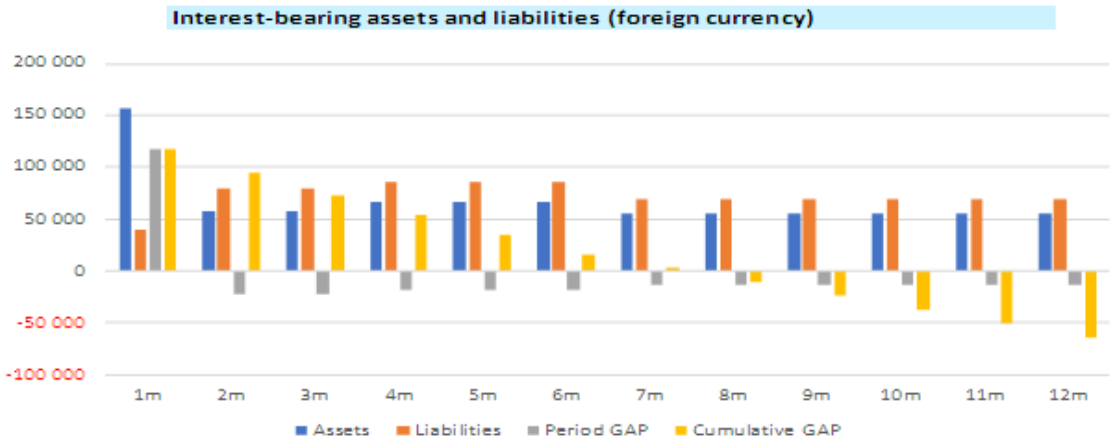


Figure 1 Percentage GAP Analysis[2]

Based on the results of the interest rate GAP analysis, the Bank's interest assets and interest liabilities are balanced within certain limits. Up to 1 year maximum (April 2021) interest rate GAP +1 932 billion soums, or 26.1% of the capital, up to 1 year maximum (June 2021) interest cumulative GAP 3 070.4 billion soums or capital 41.7%. The percentage GAP in national and foreign currencies does not exceed the threshold level set during the year.

By recalculating the maximum interval, it can be limited to limits on interest rates on equity for any specific period. In case of violation of the restriction, the revaluation of the Bank's assets and liabilities is recalculated by changing the price policy during the period.

The Risk Income (EaR) methodology measures the change in income due to negative changes in market interest rates. Risk Income (EaR) develops a loss model by assessing the risk of interest rates over a 12-month period. This is seen as a period when the bank can create new opportunities, restructure existing opportunities and liabilities, and manage overall risks wisely.

The Earning at risk return measure calculates each imbalance by estimating that it will reconsider at a new specific interest rate. It measures the change in net interest income for the remainder of the measurement period. Therefore, the calculation is as follows.

Interest-free income period change = Period interval x Interest rate change x Remaining time interval (months) / 12

This calculation is performed for each period. The sum of the period of change in net interest income for up to 12 months provides the amount of risk income:

Risk Earnings = Cumulative Change in Interest-Free Earnings = C Periodic Change in Interest-Free Earnings

[2] Prepared by the author based on data from A bank

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:4 Issue: 10 in December-2021
https://www.grnjournals.us/index.php/AJEBM

Copyright (c) 2021 Author (s). This is an open-access article distributed under the terms of
Creative Commons Attribution License (CC BY).To view a copy of this license,
visit https://creativecommons.org/licenses/by/4.0/

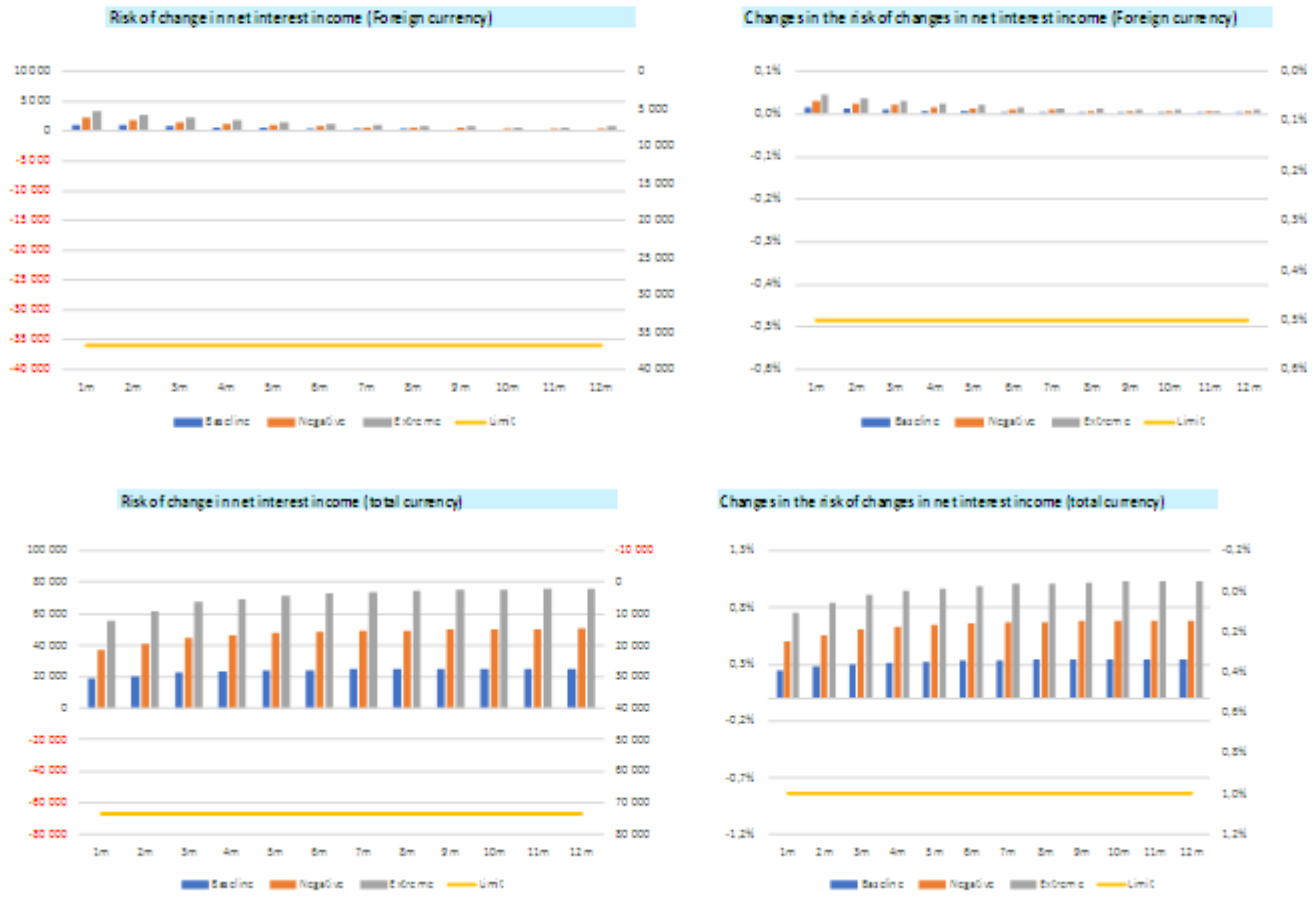


Figure 2 "A" is the financial result obtained from the revaluation of the assets and liabilities of the bank

In the "baseline" scenario, ie if the interest rate increases by 1% on assets and liabilities, the impact on maximum net interest income is 25.3 billion soums or + 0.34% of regulatory capital. If in the "negative" scenario, ie the interest rate increases by 2% on assets and liabilities, the impact on maximum net interest income will be 50.5 billion soums or + 0.7% of regulatory capital. The risk of changes in net interest income does not exceed the established risk limits. However, if the interest rate decreases by 1 and 2 percent, the impact on net interest income will be -25.3 billion soums and -50.5 billion soums, respectively. In this regard, it is necessary to coordinate the maturity of interest-bearing assets and liabilities as much as possible.

The Economic Value of Capital (EVE) methodology measures the change in the economic value of capital due to negative changes in market rates. The economic value of capital assesses the risk of interest rates for the entire spectrum of interest-bearing assets and liabilities. The longer the maturity of interest-sensitive assets or liabilities, the greater the sensitivity to changes in interest rates and the value of capital.

The economic value metric of capital is calculated in two stages. The first stage is to calculate the change in the period of economic value of capital as a change in the recalculation interval, the sensitivity coefficient and the interest rate change for a given time period:

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:4 Issue: 10 in December-2021
https://www.grnjournals.us/index.php/AJEBM

Copyright (c) 2021 Author (s). This is an open-access article distributed under the terms of
Creative Commons Attribution License (CC BY).To view a copy of this license, visit https://creativecommons.org/licenses/by/4.0/

The period of change in the economic value of capital = the period of speech x the sensitivity factor x the change in the interest rate

This calculation is done each time by term. The second step is to collect the periodic change in net interest income, which provides the amount of economic value of capital:

Economic value of capital = Cumulative change in economic value of capital = C Periodic change in economic value of capital

The maximum amount of economic value of capital can be limited as a percentage of total capital. The limit of economic value of capital is given in Annex 1 - the limit of interest rate risks. In case of violation of the restrictions, the Bank will take similar actions as described in the revaluation comparison section.

Total currency

Time band	Middle of time band	Proxy of modified duration	Assumed change in yield, bp	Weighting factor	Rate sensitive assets (RSA)	Rate sensitive liabilities (RSL)	Repricing gap	Economic value of equity change (ΔEVE)	ΔEVE, % Capital	ΔEVE Limit, % Capital	Limit breach, % Capital
1	2	3	4	5	6	7	8=6-7	9=8*5	10=9/Capital	11	12
<1m	0.5m	0,04	100	0,04	2 553 019	620 837	1 932 182	-773	-0,01%	10,00%	0,00%
1-3m	2m	0,16	100	0,16	2 508 354	2 037 682	470 671	-753	-0,01%	10,00%	0,00%
3-6m	4.5m	0,36	100	0,36	3 362 343	3 050 624	311 719	-1 122	-0,02%	10,00%	0,00%
6-12m	9m	0,71	100	0,71	5 206 123	4 850 319	355 804	-2 526	-0,03%	10,00%	0,00%
1-2y	1.5y	1,38	0	0,00	0	0	0	0	0,00%	10,00%	0,00%
2-3y	2.5y	2,25	0	0,00	0	0	0	0	0,00%	10,00%	0,00%
3-4y	3.5y	3,07	0	0,00	0	0	0	0	0,00%	10,00%	0,00%
4-5y	4.5y	3,85	0	0,00	0	0	0	0	0,00%	10,00%	0,00%
5-7y	6y	5,08	0	0,00	0	0	0	0	0,00%	10,00%	0,00%
7-10y	8.5y	6,63	0	0,00	0	0	0	0	0,00%	10,00%	0,00%
10-15y	12.5y	8,92	0	0,00	0	0	0	0	0,00%	10,00%	0,00%
15-20y	17.5y	11,21	0	0,00	0	0	0	0	0,00%	10,00%	0,00%
>20y	22.5y	13,01	0	0,00	0	0	0	0	0,00%	10,00%	0,00%
Total					13 629 838	10 559 462	3 070 376	-5 174	-0,07%	10,00%	0,00%
RSA modified duration				0,40			Parallel shift, basis point				100
RSL modified duration				0,46			Present value of basis point (1%)				-5 174
Modified duration gap				0,04			Present value of basis point (1%), % Capital				-0,07%

National currency

Time band	Middle of time band	Proxy of modified duration	Assumed change in yield, bp	Weighting factor	Rate sensitive assets (RSA)	Rate sensitive liabilities (RSL)	Repricing gap	Economic value of equity change (ΔEVE)	ΔEVE, % Capital	ΔEVE Limit, % Capital	Limit breach, % Capital
1	2	3	4	5	6	7	8=6-7	9=8*5	10=9/Capital	11	12
<1m	0.5m	0,04	100	0,04	905 460	202 954	702 506	-281	0,00%	15,00%	0,00%
1-3m	2m	0,16	100	0,16	1 299 679	360 015	939 664	-1 503	-0,02%	15,00%	0,00%
3-6m	4.5m	0,36	100	0,36	1 271 609	370 329	901 280	-3 245	-0,04%	15,00%	0,00%
6-12m	9m	0,71	100	0,71	1 723 671	528 725	1 194 946	-8 484	-0,12%	15,00%	0,00%
1-2y	1.5y	1,38	100	1,38	0	0	0	0	0,00%	15,00%	0,00%
2-3y	2.5y	2,25	100	2,25	0	0	0	0	0,00%	15,00%	0,00%
3-4y	3.5y	3,07	100	3,07	0	0	0	0	0,00%	15,00%	0,00%
4-5y	4.5y	3,85	100	3,85	0	0	0	0	0,00%	15,00%	0,00%
5-7y	6y	5,08	100	5,08	0	0	0	0	0,00%	15,00%	0,00%
7-10y	8.5y	6,63	100	6,63	0	0	0	0	0,00%	15,00%	0,00%
10-15y	12.5y	8,92	100	8,92	0	0	0	0	0,00%	15,00%	0,00%
15-20y	17.5y	11,21	100	11,21	0	0	0	0	0,00%	15,00%	0,00%
>20y	22.5y	13,01	100	13,01	0	0	0	0	0,00%	15,00%	0,00%
Total					5 200 420	1 462 024	3 738 396	-13 513	-0,18%	15,00%	0,00%
RSA modified duration				0,37			Parallel shift, basis point				100
RSL modified duration				0,39			Present value of basis point (1%)				-13 513
Modified duration gap				0,26			Present value of basis point (1%), % Capital				-0,18%

Figure 3 Analysis of the percentage duration GAP of bank A[3]

The impact of the maximum interest rate GEP on the value of capital amounted to -5.1 billion soums or -0.07% of capital, including a negative -13.5 billion soums in the national currency and a positive 0.79 billion soums in foreign currency. According to the scenario calculations, the impact of parallel changes (increase, decrease) in interest rates on capital is -0.18% in the national currency and 0.01% in foreign currencies. According to the final results, the amount of negative changes in the value of capital does not exceed the established limits, which in turn does not require changes in the volume and term structure of interest-bearing assets and liabilities.

CONCLUSIONS AND RECOMMENDATIONS

[3] Prepared by the author based on data from A bank

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:4 Issue: 10 in December-2021
https://www.grnjournals.us/index.php/AJEBM

Copyright (c) 2021 Author (s). This is an open-access article distributed under the terms of
Creative Commons Attribution License (CC BY).To view a copy of this license,
visit https://creativecommons.org/licenses/by/4.0/

Revise the Bank's interest rates to reduce the risk of interest rates, early return of existing operations, negotiations on new financing or by re-balancing the size and composition of interest-sensitive assets and liabilities by requesting available hedging instruments.

During periods of uncertainty over interest rates and market volatility, the Assets and Liabilities Management Committee should make decisions that allow the maturity of assets and liabilities to be reduced.

To implement the risk mitigation strategy, it should be submitted to the Assets and Liabilities Management Committee on a monthly basis by the Treasury Accounting and Risk Management Departments for review and remedial action in management.

Based on the modeling of possible changes in bank interest rates, it is necessary to conduct a stress test in different scenarios in each currency.

Develop and implement a methodology for calculating the impact of financing costs, operating costs, credit risk premium (premium), bank margin and other factors that must be taken into account when setting the lending interest rate in each bank.

REFERENCES

1. Decree of the President of the Republic of Uzbekistan PF-5992 "On the strategy of reforming the banking system of the Republic of Uzbekistan for 2020-2025" January 12, 2020.
2. Berdiyarov B. T “Тижорат банклари фоиз сиёсатининг ликвидлиликка таъсири” “Иқтисодиёт ва инновацион технологиялар” Scientific electronic journal "Economy and Innovative Technologies". № 5, September-October, 2017
3. Rustamov D.R. “Иқтисодиётни модернизациялаш шароитида риск менежментидан фойдаланишнинг устувор йўналишлари” Scientific electronic journal "International Finance and Accounting". № February 1, 2018
4. V.V. Bobyl “Процентный риск банка: методы оценки и управление» Financial Analytics: problems and solutions 11 (245) - 2015
5. Basel Committee on Banking Supervision Interest rate risk in the banking book Issued for comment by 11 September 2015 (www.bis.org)
6. Ахмадеев М. Г., Шакиров Д. Т. Экономическая безопасность в банковском секторе//Актуальные проблемы экономики и права. 2011. № 2. С. 39–45
7. Курилов К. Ю., Курилова А. А. Формирование эффективной структуры организации как средство преодоления негативного влияния цикличности экономических процессов//Аудит и финансовый анализ. 2013. № 4. С. 248–253
8. Макшанова Т. В. Развитие нормативно-правового регулирования рынка деривативов в России//Экономика и социум. 2013. № 1 (6). С. 452–458.
9. Питер Роуз. Банковский менеджмент: Предоставление финансовых услуг. Пер. с англ. -М: ДЕЛО, 1997. -768 с.
10. Regulation No. 2229 of the Central Bank of the Republic of Uzbekistan "On requirements to the management of banking risks of commercial banks". May 25, 2011.

ISSN 2576-5973 (online), Published by "Global Research Network LLC"
under Volume:4 Issue: 10 in December-2021
https://www.grnjournals.us/index.php/AJEBM

Copyright (c) 2021 Author (s). This is an open-access article distributed under the terms of
Creative Commons Attribution License (CC BY).To view a copy of this license, visit https://creativecommons.org/licenses/by/4.0/