

Optimization imperatives for credit policy in PJSC Sberbank of Russia

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Abstract — This paper discusses the imperatives of optimizing credit policy of a commercial bank in the dynamically changing conditions of the Russian economy. Currently, there is a growing likelihood of credit risk due to the predominance of long-term lending, while the increase in reserves to cover losses is too expensive. Therefore, the issues of finding ways to optimize credit policy of a commercial bank are urgent. One of such methods in the face of uncertainty is credit risk monitoring and use of remote services. Despite numerous studies by domestic and foreign researchers on the problem of optimizing credit policy, the usage of monitoring in risk management process and remote services are not explored sufficiently.

The main objective of this study is to examine the role of monitoring in credit risk management of modern banks activities and improvement of credit policy efficiency through remote banking services.

The methods used for research of socio-economic phenomena - abstract and logical, statistical, expert assessments, method of graphical interpretation, methods of absolute, relative and average values, graphical and tabular analysis, allowed the authors to ensure the validity of their estimates and conclusions.

Keywords — credit risk, monitoring, gap analysis, duration, model, interest rate risk.

I. INTRODUCTION

In carrying out economic transformations associated with overcoming crisis processes and national economy recession, the sufficient role is given to financial institutions. Commercial banks are a source of credit resources acting as financial institutions and being an important element in

implementing concentration of temporarily free capital and its distribution in needy sectors of financial system.

It is widely known that the process of granting loans and borrowings is the most profitable for the bank, but also the most risky. Achieving success in this area is the fundamental basis for effective work, and credit policy is its indicator.

In recent years, Sberbank of Russia (hereinafter - the Bank) managed to reverse the decline in its market share and strengthened its market position; it accounts for 30% of the assets of the entire domestic banking system and for 45% of long term lending to the economy. This allowed to double its loan portfolio and to expand the range of banking services provided. According to its market position indicators, assets and capital volumes, financial performance and scale of infrastructure, the Bank is the largest in the country, which provides undeniable competitive advantage.

The activities of the Bank are carried out in the context of globalization of both the world and Russia's financial systems, and in the context of banking operations complication. The systemic economic crisis in the economy development at the macro, meso and micro levels necessitated the development of imperatives (directions) for optimizing the Bank's credit policy [1]. The solution of this problem is impossible without analysing approaches existing in domestic and foreign research.

Surveys on the development of banking efficiency theory and quality management of bank lending are presented in the papers by foreign scientists: J.M. Keynes [2], A. Smith [3], L. Harris [4.], and others. One of the first Russian economists to

analyse the basis of credit policy for commercial banks (in the post-Soviet period) was G.S. Panova pointing to the fact that under the conditions of command and administrative economy credit policy was carried out only at a macroeconomic level. In this regard, some Soviet economists argued that credit policy is a broader concept than banking policy. However, in the current market conditions, that is, from the point of view of many banks functioning at the microeconomic level, credit policy is an integral element of the overall banking policy. It is interpreted as a definition of strategy and tactics in terms of credit process organization. Various aspects of credit policy in relations with the population were considered by G.S. Panova [5].

V.A. Shapovalov's approach is also of interest as he considered credit policy to be bank's activities philosophy that is an integral part of the bank's planning process which begins with defining its global mission and moves to establishing specific procedures and rules for conducting operations at various levels of management [6].

To define the essence of credit policy and the need for its development, many authors (A.A. Strogonov, Y.A. Tregubovich and others) considered the structure of the approach associated with the process of granting and repayment of the loan by the borrower, while it was divided into three main groups: preliminary work, registration and management of credit [7; 8].

Among many different approaches to determining credit policy of banks, the most relevant one has emerged in modern foreign literature - the prudential approach. Thus, in their work, John Kwaning Mbroh and KwesiAsiedu Koomson noted the importance of credit sector in reviving financial system through its banking sector, with credit policy of banks playing an important role. In these authors' opinion, in accordance with the development trends of credit market, credit policy should allow to improve methods for assessing creditworthiness of borrowers in order to reduce credit risks. In particular, the authors propose to introduce gender analysis of borrowers as an innovative component in credit risk assessment [9].

Having considered the presented approaches to credit policy definition, we can conclude that despite their differences, there is no logic contradiction in the statement of the essence of the analysed term. This emphasizes the diversity of ways to interpret credit policy, therefore we consider it possible to define it in a broad sense as a set of rules, regulations, directives, goals, objectives and recommendations for the provision of loans to bank customers aimed at balancing the bank's loan portfolio and reducing risks [1]. As practice shows, the choice of credit policy ideology is the exclusive prerogative of commercial banks.

Some problems of credit monitoring were considered in the papers by S.D. Bakhisheva, M.I. Salavatov [10], V.T. Travkina, [11], A.E. Ushanov [12].

At the same time, despite accumulated practice and existing achievements in the problem under study, given that the Bank operates in dynamically changing conditions, there is

a need for a scientific justification for improving credit policy effectiveness by taking into account time factor in monitoring process and through remote banking services. We believe that taking into account time factor in monitoring will expand the boundaries of credit and interest risk analysis and reduce exposure to uncertainty.

The Bank should monitor credit risks, both in the context of the individual borrower, and in the context of the whole Bank's loan portfolio. Practice shows that the value of information is its ability to influence such actions as issuing new loans and providing additional loans, refinancing, reducing credit lines, insuring against default, and working with borrowers in order to create an alternative source of funding, securitizing risk through insurance [13].

II. MATERIALS AND METHODS (MODEL)

The study was conducted on the basis of economic and statistical methods, system analysis, as well as general scientific methods of comparison and contrasts.

To monitor credit risk, we used the model proposed by Moody's Analytics the essence of which is to expand the scope of analysis by incorporating time dimension.

The basis of this model is the assumption of the dependence of risk management on completeness of available information. Initially, the bank receives partial information, then, after the credit survey, it becomes complete and allows you to develop an effective strategy for monitoring credit risks. In the developed structure, the relationship between the survey cost and the impact characteristics is multidimensional; it provides theoretical interpretation of monitoring methods. The survey cost is lower when the hedging decision is already predetermined, and the highest values are at the point where the lender is indifferent to hedging and not hedging; with constant excess spread, the survey cost increases with an increase in default probability.

The peculiarity of this model is the expansion of the analysis framework by including time measurement. In this setting, partial information is public, and complete one is supplemented by personal information. It should be noted that the data relevance obtained in survey process decreases with time. The optimal time before the next survey depends on spread, survey cost, cost of ending relationship with the borrower, public information and the results of the latest survey.

As practice shows, the optimal period for monitoring credit risk is a quarter. This is due to the fact that any loan that requires more frequent surveys creates costs excess.

Currently, Sberbank has policies of collecting information on borrowers, processing this information and conducting monitoring. However, since the IT infrastructure is changing rapidly, these policies are also transforming. Numerous parameters are required to determine the best monitoring strategy: some of these parameters are known (for example, credit conditions), some of them can be estimated empirically (for example, PD, LGD), some of these parameters can be

estimated by business logic (for example, survey cost), some of these parameters are more difficult to estimate empirically (for example, cost of ending relationship with the borrower). You can use the structure to define the internal consistent checking policy using reasonable values for “recognizable” parameters and “guessing” “unknown” parameters, and then revising “unknown” parameters to get a monitoring policy that makes the meaning of obtained results intuitively clear. Such a process can lead to a more effective analysis strategy than trying to collect and process all the available information about all the borrowers [13].

The model itself can be represented as follows:

$$PD_{F,t}(U, S_t; \beta_0, \alpha, \psi) = N(\beta_0 + \alpha U + \psi S_t) \tag{1}$$

where

$PD_{F,t}$ – default probability estimated on the basis of complete information;

U – public information fixed for each borrower;

S_t – time-varying private information;

β_0 – discount rate;

α – parameter describing sensitivity of $PD_{F,t}$ U ;

ψ – parameter describing sensitivity of $PD_{F,t}$ S_t .

III. RESULTS AND DISCUSSION

A. Analysis of credit policy effectiveness

The success of the Bank’s credit policy is indissolubly tied to compliance with the standards established by regulatory authorities. Consideration of capital adequacy ratios and liquidity ratios is due to the fact that it is in the dynamics of these indicators that it is possible to track the effect of risk management success. Their values are presented in *Table 1* which shows significant improvement in the Bank’s economic and regulatory capital. The first is necessary to cover losses from various risk factors, the second - to meet the minimum requirements and ensure operational stability [14].

TABLE I IMPLEMENTATION OF LIQUIDITY AND CAPITAL ADEQUACY RATIOS [14]

Capital adequacy ratios	According to Basel III	RF Central Bank requirements	Value	
			2016.	2017.
H1.1 – basic capital adequacy (Tier 1 capital CET1)	4,5%	4,5%	7,9%	10%
H1.2 – capital adequacy (Tier 1 capital)	6%	6%	7,9%	10%
H1.0 – equity capital (Tier 2 capital)	8%	8%	11,9%	13,8%
Liquidity ratios	Critical value	RF Central Bank requirements	Value	
			2016	2017.
H2 – instant liquidity ratio	min 20%	More than 15%	74,3%	116,4%
H3 – current liquidity ratio	min 55%	More than 50%	66,4%	154,4%
H4 – long-term liquidity ratio	max 115%	Less than 120%	11,2%	65,5%

Let us analyse the structure of loan portfolio which will allow us to evaluate various segments of its functioning, degree of the bank’s activity concentration, nature and timing of existing loans. *Table 2* shows two criteria: subjects of credit relations and lending currency.

TABLE II BANK’S LOAN PORTFOLIO STRUCTURE [15]

Specification	Value		
	2016.	2017.	
By subjects of lending, billion roubles	Corporate loans	14 958,7	13 633,0
	Loans to individuals	4 965,6	5 031,7
In terms of currency, %	Rubbles	60,5	61,5
	U.S. dollars	25,5	24,0
	Other	14,0	14,5
By redemption period, %	Up to 6 months.	14,6	15,1
	6 – 12 months	12,6	10,6
	1 – 3 years	32,7	30,3
	More than 3 years	40,1	44,0

By the criterion of lending currency, the largest part invariably falls on roubles, this indicates significant concentration of the Bank’s operation on domestic market, but loans are also issued in foreign currency.

The analysis of credit policy leads to the conclusion about stabilization of the Bank’s financial situation after the national economy recession, about its ability to develop and grow, about introduction of innovations and achievements of information technologies which is important for the further improvement of its activities.

B. Optimization imperatives for credit policy in PJSC Sberbank of Russia

The relevance of data processing and development of effective solutions is a kind of “engine” in search for new methods to improve credit policy. To optimize credit policy, it is necessary to improve monitoring of credit and interest rate risks, as well as to increase the efficiency of remote banking services. To monitor credit risks, we consider it appropriate to use the model proposed by Moody’s Analytics. On the basis of empirical studies we calculated the values of model parameters in three different scenarios: basic, optimistic, and pessimistic, and on this basis we determined the coefficients of monitoring assessment accuracy (AR) using partial and complete information (*Table 3*).

TABLE III PARAMETER VALUES OF CREDIT RISK MONITORING MODEL [13]

Parameter	Basic option	Availability of informative data	Using public data only
β_0	-3,51	-5,77	-4,84
α	0,83	1,62	0,54
ψ	0,31	0,92	0,95
Accuracy factor for partial information	77,8%	77,8%	35,0%
Accuracy factor for complete information	85,5%	93,0%	85,5%

Application of this technique will speed up data collection and processing, increase analytical quality of monitoring, save costs of too frequent checks and focus on problem loans.

With probability value fluctuations from 0 to 1, according to the frequency necessary monitoring we propose to divide loans into the following segments:

1. For retail sector:
 - 1.1. With PD from 0 to 0,40 – quarterly survey;
 - 1.2. With PD from 0,41 to 0,80 – monthly survey ;
 - 1.3. With PD from 0,81 to 1 – weekly survey.
2. For corporate sector:
 - 2.1. With PD from 0 to 0,25 – quarterly monitoring ;
 - 2.2. With PD from 0,26 to 0,50 – monitoring every 2 months;
 - 2.3. With PD from 0,51 to 0,75 – monthly monitoring;
 - 2.4. With PD from 0,76 to 1 – weekly monitoring.

This approach will allow to modify risk management mechanisms. Using the recommendations of the ARB (Association of Russian Banks), we can state that risk management process depends on the nature of risks (credit, interest and loss of liquidity), on the level of proportionality between ICAAP usage and risk significance. On the basis of their ratio (*Table 4*), it is necessary to apply appropriate methods delimited by levels [14]. According to the papers of the Basel II Standards Committee and the ARB Risk Management Committee, the advanced approaches include: loan portfolio model (EC, CVA) for credit risks,; interest rate risk VaR (measurement of the effect on net interest income) for interest rate risks; model of probabilistic cash flows for liquidity loss risk - Liquidity VaR. Individual quantitative approaches are used respectively: an approach based on internal credit ratings, analysis of duration and stress testing, liquidity ratios for the risks under study, and coefficient and percentage approaches and gap analysis for high-level and expert estimates.

TABLE IV DEPENDENCE OF RISK MANAGEMENT METHODS ADVANCEMENT LEVEL ON RISK SIGNIFICANCE [14]

Significance of risk Level	Most significant risks	Significant risks	Insignificant risks
Advanced	Advanced management approaches	Individual quantitative approaches	Advanced
Extended	Advanced management approaches	High-level estimates	Extended
Basic	Individual quantitative approaches	High-level expert estimates	Basic

Gap analysis is the basis of the Bank’s interest rate risk monitoring, but this method, as specialists’ experience evidences, has the following disadvantages. It is based on short-term time intervals and ignores long-term cash flow forecast, it does not take into account changes in financial

asset value, and it is a simplified survey method [17].

Consequently, it is necessary to develop ways of levelling the existing shortcomings to take into account time factor and correspondence of advanced assessment. For this you can use several ways. First of all, the improvement of gap analysis using dynamic modelling which includes taking into account changes in interest asset and liabilities spreads with similar maturities, built-in options, and changes in the structure and volume of the bank's balance sheet. According to experts’ research, such a dynamic model will give a more accurate and comprehensive assessment [17].

Secondly, it is advisable to replace gap analysis with more advanced management methods, namely, with analysis of duration. Duration is the most unique method of assessing interest rate risk with a focus on cash flow forecast [12]. Duration analysis shows that interest rate risk arises when there is a mismatch between timing of cash inflows and outflows.

In conditions of digitalization, Sberbank pays considerable attention to applying achievements of modern automated technologies to its credit policy implementation. Sberbank intends to expand remote banking services (RBS) by remote client identification. Clients will need to register in the single ESIA system, and then they will be able to use banking services without visiting credit institutions. This will create favourable opportunities for the expansion of banking activities, and also increase banking sector competition in general especially in loan segment. The analysis of loan portfolio structure (*Table II*) made it possible to identify a significant drawback – the growth rate of long-term loans exceeds that of short-term loans.

To eliminate this drawback, it is necessary to increase the growth rates of high-margin products (credit cards and short-term loans). The Remote Bank Service provides the possibility of submitting an online consumer loan application, however, it is impossible to conclude a credit agreement online; therefore, the client still needs to contact the Bank branch to receive it. It turns out that RBS is carried out only partially which is not always convenient for borrowers. For the Bank, it is possible to use the practice of online lending in order to adapt most quickly and efficiently to the Bank of Russia’s RB project and change IT technologies trends. Strengthening competitive advantages was one of the priorities due to a fairly high level of credit market competition among both traditional and “niche” actors.

In our opinion, it is necessary to introduce the issuance of credit lines to individuals, since the Bank has proposals for issuing such loans only to legal entities. Such a loan tool will be profitable and quite convenient for customers who have a periodic need for borrowed resources. The credit line has a number of advantages compared with a conventional loan, namely:

- it can be issued several times within established limits, this will allow to meet the needs of borrowers in loan funds cyclically when necessary;
- it is possible for the borrower to repay fully or partially

within the limited timeframes, while for ordinary loans the repayment periods are strictly set (usually monthly) in the amounts to be paid;

- with ordinary lending, the right of early repayment is rarely provided; credit line makes it possible to repay ahead of time, i.e. the borrower can repay in a shorter time than it was established by the time limit, thereby reducing the amount of interest payable;

- it is convenient for the bank – when using a credit line, unlike one-time loans, there is no need to re-consider loan applications and enter into new credit agreements each time to issue the next tranche, thereby the bank reduces transaction costs.

The advantages both for borrowers and the bank make credit lines to be the highest priority area of activity. This will allow the Bank to oust microfinance organizations from their market share, as such loans are applied for because of short application processing periods and small requested amounts which usually are not issued by large credit institutions.

Credit lines will allow such borrowers to take small amounts in instalments within a certain period of time, while payment for the loan will be significantly less compared to the conditions of microloans, and repayment terms are more flexible.

It will be impossible to achieve such results without RBS on which the issuance of credit lines including filing, processing and approval of the application will rely. Without RBS, clients should contact a bank branch to receive each tranche which is inconvenient for many customers and thereby reduces the demand. Therefore, the integration of the credit lines issuing possibility into its own online system will be the most optimal option for the Bank.

Issuance of credit histories through the Bank's online system has become a new service introduced as a source of information dissemination and designed to encourage borrowers to lend. Customers now have an opportunity to find out their financial reputation by obtaining a credit report which will allow them to find out their credit rating, understand the reason for refusing loan issue and monitor their credit history status.

However, in reality, this service is not widely spread due to the existing shortcomings; namely, the credit rating presented in the report does not always coincide with the Bank's scoring estimate. Therefore, there are cases of refusal in the presence of a sufficiently high rating which negatively affects the work with clients. According to the Federal Law "On Credit Histories", each credit institution enters into agreements with the credit history bureau (CB) and provides it with all the necessary information the list of which is also established by Article 4 of this Law. The CB, in its turn, forms histories and has the right to provide a report to the user and the subject upon request [18].

The reason for the discrepancy between the Bank's and the CB's estimates may be the lack of credit history unification, because the Law determines only the list of information that is required by content, but there is no specification in what form

and format it should be presented. For this reason, it is likely that the CB generates a report according to its own methodology differing from the scoring assessment method of the Bank. Therefore, it is important to neutralize this drawback, since the presented service has a rather high potential for increasing credit policy efficiency. A possible and most optimal solution would be coordination of the method of processing information between the parties on the principles of harmonization, unification and standardization after examining the existing cases of estimates differences.

IV. CONCLUSION

A. The study of Sberbank's operating conditions gives the idea of the necessity to improve credit policy in order to achieve the established strategy of strengthening positions as one of the leading and stable financial institutions. The empirical studies of Sberbank's credit policy effectiveness allow us to draw the following conclusions: its financial potential was restored after the recession; the loan portfolio structure according to the criterion of loans granting terms has drawbacks and contradicts the bank's strategy in terms of the growth rates of long-term loans (least marginal) exceeding short-term loans; liquidity and capital adequacy ratios fully comply with the requirements of the Central Bank of the Russian Federation and Basel international standards.

B. Two main directions were proposed to optimize the credit policy of Sberbank:

The first one is based on the need to improve monitoring of credit and interest risks in order to ensure the asset quality stability and to improve the process of assessing its volatility. To make credit risk monitoring better, the improved survey model was proposed. It takes into account time factor, its variability and influence on decision making. The essence of this approach is the dependence of accuracy degree of default probability estimate on the completeness of available information about the borrower.

This model allows to simplify monitoring process, while simultaneously increasing its analyticity. Its main advantage is the possibility of the most adequate forecast of loans cash flows taking into account their riskiness which will make possible to develop the most effective solutions. This model allows to simplify monitoring process, while simultaneously increasing its analyticity. Its main advantage is the possibility of the most adequate forecast of loans cash flows taking into account their riskiness which will make possible to develop the most effective solutions.

Since, by their economic nature, credit and interest rate risks are closely interrelated; their improvement should take place in parallel.

The second direction is based on the role of information technology in banking, through which it is possible to increase capacity and growth stimulation for high margin credit products.

Improving lending efficiency through remote banking services is possible due to active application of online lending

practice, coordination of credit histories principles with credit bureaus, introduction of a new credit instrument – credit line for individuals as a way to increase the growth rate of short-term loans and strengthen bank competitiveness.

References

- [1] Alikaeva M.V., Oborin M.S., Shinakhov A.A. Kreditnaya politika kak instrument deyatelnosti kommercheskogo banka [Credit policy as a tool of commercial bank activity]. *Servis v Rossii i za rubezhom* [Service in Russia and abroad]. 2017. T. 11. № 6, pp. 152-167.
- [2] Kejns Dzh.M. Obshchaya teoriya zanyatosti, procenta i deneg [The general theory of employment, interest and money]. M.: Progress, 1978. 494 p..
- [3] Smit A. Issledovanie o prirode i prichinah bogatstva narodov [Research on the nature and causes of the wealth of nations.] M.: Eksmo. 2007. 960 p.
- [4] Harris L. Denezhnaya teoriya [Monetary theory]. M.: Progress, 1990. 750 p.
- [5] Panova G.S. Kreditnaya politika kommercheskogo banka vo vzaimootnosheniyah s naseleniem.: dissertatsiya doktora ekonomicheskikh nauk [Credit policy of a commercial bank in relations with the population.: dis. Doctor of Economic Sciences] [Electronic resource] - access mode <http://dissertacii.narod.ru/accord:26.03.2019>
- [6] SHapovalov V.A. Kreditnaya politika banka i mekhanizm ee realizacii.: dissertatsiya kandidata ekonomicheskikh nauk [The credit policy of the bank and the mechanism of its implementation.: Dis. Ph.D.] [Electronic resource] - access mode <http://dissertacii.narod.ru/> request date: 03.25.2019
- [7] Strogonov A.A. Kreditnaya politika kommercheskogo banka [Credit policy of a commercial bank] *EHkonomika i politika* [Economics and politics]. 2014.№2 (3).p.190-193
- [8] Tregubovich YU.A. Kreditnaya politika kommercheskogo banka: sushchnost' i ehlementy [Credit policy of a commercial bank: the nature and elements] *Aktual'nye problemy aviatsii i kosmonavтики* [Actual problems of aviation and astronautics].2013.№9.p.346-347.
- [9] John Kwaning Mbroh, KwesiAsiedu Koomson The Credit Policies and Credit Finance Creation Practices by Commercial Banks: Perspectives of Staff and Clients of the Prudential Bank Limited [Electronic resource] - access mode: <http://article.sciencepublishinggroup.com/> request date 25.03.2019Forbes Russia finansovo-ekonomicheskii zhurnal [Forbes Russia financial and economic journal Elektronny] Available at: <http://www.forbes.com.ru> (Reference date: 29.01.2019).
- [10] Bahishev S.D., Salavatov M.I., Aliev B.H. Sravnitel'nyy analiz metodov monitoringa v bankovskoy sfere [Comparative analysis of monitoring methods in the banking sector]. *EHkonomika i predprinimatel'stvo*. [Economy and Entrepreneurship].2016. №4.
- [11] Travkina E.V. Monitoring bankovskikh riskov: sushchnost', sodержanie i principy organizatsii [Monitoring of banking risks: the nature, content and principles of the organization]. *Finansy i kredit*. [Finance and credit].2011.№4.
- [12] Ushanov A.E. Monitoring riska kredita na stadii ego ispol'zovaniya [Credit risk monitoring at the stage of its use]. *Finansovaya analitika: problemy i resheniya*. [Financial analytics: problems and solutions]. 2015. №35.p.29-38.
- [13] Moody's Analytics - A Theory of Monitoring Credit Risk [Electronic resource], 2013.
- [14] Obshchie voprosy organizatsii protse ssa vnutrennei otsenki dostatochnosti kapitala (VPODK) [General questions of the organization of the process of internal assessment of capital adequacy (ICAAP)]: kollektiv avtorov; pod red. Komiteta po standartam Bazel' II i upravleniya riskami pri Assotsiatsii rossiiskikh bankov (ARB) [a group of authors; by ed. The Basel II Standards and Risk Management Committee at the Association of Russian Banks (ARB)], 2013, p.49.
- [15] Finansovye dannye: kreditnyy portfel' PAO SBERBANK [ehlektronnyy resurs] Rezhim dostpua URL: <http://www.sberbank.ru> [Financial data: loan portfolio Public Joint Stock Company Sberbank [electronic resource] Access Mode URL: <http://www.sberbank.ru>. Reference date: 19.02.2019.
- [16] Obshchie voprosy organizatsii protse ssa vnutrennei otsenki dostatochnosti kapitala (VPODK) [General questions of the organization of the process of internal assessment of capital adequacy (ICAAP)]: kollektiv avtorov; pod red. Komiteta po standartam Bazel' II i upravleniya riskami pri Assotsiatsii rossiiskikh bankov (ARB) [a group of authors; by ed. The Basel II Standards and Risk Management Committee at the Association of Russian Banks (ARB)], 2013, p.49.
- [17] Sokolova Ya.Yu. Sovershenstvovanie GAP-analiza protsentnogo riska pri pomoshchi dinamicheskogo modelirovaniya [Improving GAP-analysis of interest rate risk with the help of dynamic modeling]. *Ekonomika i upravlenie* [Economics and Management]. 2012, №2 (76), p.134-139].
- [18] Federal'nyi zakon «O kreditnykh istoriyakh» ot 30.12.2004 №218-FZ (red. ot 03.07.2016) [Federal Law "On Credit Histories" dated December 30.12 2004 №. 218-FL (as amended on July 03, 2016)] Available at: http://www.consultant.ru/document/cons_doc_LAW_ (Reference date: 29.01.2019).