

METHODS OF ASSESSING OF FINANCIAL INSTITUTIONS ACTIVITY CREDIT RISK

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Abstract. The authors turn to the analysis fundamentals and credit risk assessment in international practice. The authors have been proposed technique assessments of the following indicators that have a significant impact (proved by the author) to assess the credit financial institutions activity. To solve this problem the authors offer a geometric interpretation to determine the addiction type, whereas we must time consider all the indicators, and their quantity number is three, then they are convenient to interpret in three dimensions.

Keywords: Financial stability; financial risk; Mathematical Methods; Financial Institutions; Risk Management

Introduction. The effectiveness of financial resources redistribution in the country depends on the financial intermediary's organization in the financial market. We should find a new ways to increase the investment activity in conditions of reducing investment flows, decreasing real economy sector landings by the banks. The current investment climate in Ukraine cannot be considered as favorable for both domestic and foreign investors because of a number of reasons. In this regard, the question of non-bank credit institutions role increasing in the domestic economy should be pay attention at. However, for their activity success it is necessary to properly evaluate the financial institutions lending risks.

There are many specialized methods of assessing of financial institutions activity credit risk, the most common of which are: statistical method, the analysis of the feasibility costs method, expert estimates method, the analytical method and using counterpart's method.

Literature review. With the help of expert assessments methods effectively solved so important for risk analysis tasks as identifying the sources and causes of risk, different risks identification, identifying ways to reduce risk, the scenarios in the case of risk prediction implementation, prognostication the competitors actions and others. To heuristic methods belong widely known methods used in international practice, BERI and Swiss Banking Corporation method. They are global in their nature, and on their basis, we can conclude of the whole economy riskiness degree, but not specific financial institution.

One more method of quantitative risk assessment - analytical method - is a kind of statistical evaluation principles combination and expert analysis. Authors V. Lukyanova and TV Chef in their book "General assessment procedures and modeling risk" delivering the most precise definition of this method, claiming that "the analytic risk assessment method" - a system of statistical estimates based on preliminary expert selection key parameters for subsequent analysis of these impact factors "[1].

Legal fundamentals. The National Bank has identified a system for assessing each risk of category in accordance with the Guidelines for the examination of banks "Risk assessment system" [2]. This assessment system provides banking risks consistent (a key factor, which today is not entirely objective, and that does not include the dynamics changes of the financial institutions state) way to measure risks and to determine which supervisory procedures be taken. For nine risk categories [3] - credit risk, liquidity risk, changes interest rate risk, market risk, currency risk, reputation risk, legal and strategic risk, operational and technological risk - observers estimate the amount of risk, quality risk management, the cumulative risk and risk direction (Table 1).

Table 1

Factors of each risk category estimation in accordance to the guidelines for the banks surveillance 'risk assessment system" that defined by the National Bank of Ukraine

Risk type	Factors
Credit risk	- the existence of adequate, effective, proven to the internal regulations performers (regulations, procedures, etc.) of credit risk management, approved by the bank relevant authorities, based on the corporate management principles and appropriate practices implementation of its requirements; - the portfolios compose (credit, investment, etc.) and the concentration existence.
Liquidity risk	- the existence of adequate, effective, proven to the internal regulations performers

	<p>(regulations, procedures, etc.) of credit risk management, approved by the bank relevant authorities, based on the corporate management principles and appropriate practices implementation of its requirements;</p> <ul style="list-style-type: none"> - the assets balance quantity and their distribution by the liquidity degree on the liabilities structure; - the amount, structure and liabilities diversity level; - borrowed funds to a chosen bank weighted average cost in relation to its comparative banks group; - net funding gaps focus on short-term gaps, including: projected funding requirements; ability to cover a potential financing gaps at reasonable interest rates by additional resources attraction; the financial markets liquidity, where the funds can be attraction; - the compose of the balance and off-balance portfolios including: the funds outflow and inflow; - liquidity and the existence of collateral agreements, which can be broken prematurely (e.g., deposit agreements, etc.); - secondary markets liquidity where you can get the refinancing; - the deterioration of the bank's reputation on the market, that revealed through credit ratings decreasing and interest rates increasing during the fundraising by the bank; - official or unofficial conclusions of rating services and analysts about the institution, including current ratings and ratings trend (publications in mass media); - the availability of an adequate plan in case of crisis situation; - the existence of timely, accurate and informative management information; - the level and qualification of management and staff; - the availability of appropriate control mechanisms for the information accuracy monitoring of relevant accounting treatment and regulations or laws compliance.
Interest rate risk change	<ul style="list-style-type: none"> - the existence of adequate, effective, proven to the internal regulations performers (regulations, procedures, etc.) of credit risk management, approved by the bank relevant authorities, based on the corporate management principles and appropriate practices implementation of its requirements; - the value of net interest margin dynamics stability and the adequacy compared with its comparison bank groups; - the interest rate risk component and total level, including the resources value changing risk, basis risk, yield curve risk and risk associated with the choice right (option) and income and capital concerning; - how adequately the bank estimate the interest rate risk both in the short and long term; - the vulnerability of earnings and capital in the case of significant interest rates changes conditions, such as the gradual shift rates and the yield curve shape changing; - the different products nature risk, i.e their quantity and sensitivity level to the interest rates changes; - the prolonged use relative quantity and prospects of cheap and stable funding sources; - the availability of timely, accurate and informative management information for interest rate risk monitoring; - the bank practice existence of periodic force inspection and estimates validity and valuation risk model; - whether developed independent measurement process or not and analysis connecting with the risk of interest rate changes in all significant activities with the different scenarios using; - whether the bank has enough experience or not and how adequately it respond on market condition changes; - whether the bank has sufficient access to the market for flexible risk level adjustment or not; - the level and qualification of management and staff; - the existence of adequate control mechanisms for the information accuracy monitoring,

	the appropriate accounting treatment and internal regulations compliance, the regulations and laws.
Market risk	<ul style="list-style-type: none"> - the existence of adequate, effective, proven to the internal regulations performers (regulations, procedures, etc.) of credit risk management, approved by the bank relevant authorities, based on the corporate management principles and appropriate practices implementation of its requirements; - market risk Sources, including price changes on the interest rate instruments, commodities and equity securities, as well as the exchange rates dynamics; - the size, duration and complexity of the positions; - market risk components and various products price sensitivity, including off-balance sheet arrangements (such as swap, forward and option contracts); - stability of real cash flows from trading operations; - value and capital under risk dynamic revenue; - bank vulnerability by the interest rate changes probabilistic scenarios and market shocks (stress testing); - the hedge or risk positions closing possibility that are always available, including professional management ability to make hedging transactions and bank access to their respective markets; - the open positions amount compared with the real cash earnings expecting (i.e risk versus reward); - the availability of timely, accurate and informative management information; - the level and qualification of management and staff; - the existence of adequate control mechanisms for the information accuracy monitoring, the appropriate accounting treatment and internal regulations compliance, the regulations and laws.
Currency risk	<ul style="list-style-type: none"> - the existence of adequate, effective, proven to the internal regulations performers (regulations, procedures, etc.) of credit risk management, approved by the bank relevant authorities, based on the corporate management principles and appropriate practices implementation of its requirements; - the amount of balance and off balance items which are subject to reassessment due to the current exchange and term exchange rate changes; - the structure of balance and off-balance items for the following factors: currency and products; - existence or expected period of subsequent position maintenance; - the amount and period of inconsistent cash flows; - the size of currency positions quantity trading of which are limited; - potential capital loss amount connected with the currency positions transfer into their hryvnia equivalent in the case of exchange rate changes, considering last trends and forecasts; - the availability of timely, accurate and informative management information; - the level and qualification of management and staff; - the existence of adequate control mechanisms for the information accuracy monitoring, the appropriate accounting treatment and internal regulations compliance, the regulations and laws.
Operational and technological risk	<ul style="list-style-type: none"> - the existence of adequate, effective, proven to the internal regulations performers (regulations, procedures, etc.) of credit risk management, approved by the bank relevant authorities, based on the corporate management principles and appropriate practices implementation of its requirements; - the number and complexity of operations processing compared with the development level and operational capacity and control systems, including the preliminary results of these systems, their current state and further improvement prospects; - the probability of technological and operational failures, overrun of staff authority, shortcomings in the preliminary operations analysis during the decision-making and the

<p>monitoring absence (including temporary) or logging operations with clients or counterparties;</p> <ul style="list-style-type: none"> - the bank availability and compliance of technological operations cards; - the availability, quantity, nature and causes of administrative procedures and accounting controls violations; - the potential financial loss due to the performer or fraud error, low operating bank competitiveness, information systems inadequate, incomplete information about the counterparty or transaction, operational and technology failures; - the history and nature of customers complaints and appeals to the bank due to operating systems drawbacks and the bank reaction on them; - the amount and adequacy of the banking software and its accompanying and other services control which are carried out with the third parties involvement (outsourcing); - the information technology strategy adequateness, the strategy must conform the current and anticipated requirements in relation to the bank and include the structure of technological means, telecommunication and software, data networking, and information databases integrity; - for the process availability: determine the information needs for effective bank management; determine the information systems architecture for transactions processing and products and services providing; information integrity and preservation (e.g. creating, processing, storage and data); - the qualifications and skills level of managers and staff; - the adequate control mechanisms existence to the information accuracy monitoring, the accounting treatment appropriate and regulations or laws compliance.
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In general, it can be confirm that such risk assessment system does not give a clear idea of numerical parameters of money losses from banking risks for financial institutions, and therefore considered by us as inefficient and need of improvement in part of the identification mechanism, analysis and assessment of certain risk types, including financial institutions credit risk assessment [4].

Basic methodological Ukrainian banking practices to assess and manage the risks approaches contained in the Guidelines for the banks examination "Risk assessment system "[2] and the guidelines to management risk in Ukrainian banks organization and operation [5], made by the NBU.

Therefore, we turn to the analysis fundamentals and credit risk assessment in international practice. Basel Committee on Banking Supervision defines credit risk as "probability of default by the borrower or counterparty of its obligations under the specified conditions" [6]. The capital requirements calculation based on the counterparty risk ratio and (or) instrument provides that certainly there is not required risk by the government, and therefore capital for its coverage is not required (weight - 0%), to cover the risks of Organization for economic cooperation and development country member banks should be 1.6 units of capital per 100 units loans (weight - 20% in the Ukrainian banking practice - 50%), and to cover the borrower risks of

- individuals and businesses need 8 units of capital on 100 units loan (weight - 100%). Some types of instruments can be assigned less risk weight (e.g. guarantees and mortgage loans) [7].

Recall that, according to the new Basel Committee on Banking Supervision on bank institution capital adequacy requirements, the minimum capital for credit risk covering can be determined with the help of two methods: the standardized approach and method, based on internal ratings, moreover the latest has two versions - stock and progressive approach [8].

The risk ratio (risk level) can be determined depending on the requirements category, debtor category and external rating and take values that hover in the Table 2 [9].

Table 2

Rate risk determination (the credit financial institutions risk level, L_{CR}) depending on the requirements category, debtor category and external rating

Depending on the ratio of a particular asset class and external rating, %							
Long-term rating categories (from - to)	AAA AA-	A+ A-	BBB+ BBB-	BB+ BB-	B+ B-	Less B-	Without rating
Central government agencies	0	20	50	100		150	100
Banks: variant 1	20	50	100			150	100
Variant II: ПСН more than 3m	20	50		100		150	50
Variant II: ПСН less than 3m	20			50		150	20
Corporation	20	50	100		150		100
Short-term rating categories	A1/P1		A2/P2		A3/P3		інші
All debtors	20		50		100		150
Depending on the ratio of a particular asset class, but no ranking							
Type of asset							rate risk (the risk level), %
Regulatory retail portfolio							75
Mortgage loans: a) residential real estate							35
b) commercial realty							100
Capital expenditure: a) non-banks institution							150
b) bank institutions							100
Claims overdue more than 90 days							50-150
Other assets, that do not depend on non-trading portfolio							100

The authors have been proposed technique assessments of the following indicators that have a significant impact (proved by the author) to assess the credit financial institutions activity risk:

1. The territorial distribution (normalized weighted value in total quantity, Territorial Distribution, TD_j) credit unions and finance companies with guidance cluster number (based on cluster analysis). Since the normalized weighted value is determined by the number of cluster, then to it, with the help of the logic theory rules, apply the rule of "the smaller the cluster number - the better the normalized weighted value," which will determine the operation type of taking into account normalized weight value - inverse relationship, $1 / TD_j$.

2. Interdependence and interrelation assessment of financial companies and credit unions on financial services market on their own authoring method on the density distribution of financial companies and credit unions basis (Consistence of the Financial Institutions, CFI_k) the defined limits between clusters at the average integral indicator based on the author's own calculating model of the debtor integral index - businesses (obtained on the multivariate discriminant analysis basis).

3. Estimates of the financial companies and credit unions on financial services market interdependence based on the author's own mechanism based on the finance companies and credit unions connectedness weight by the other finance companies and credit unions average number between which is the Z_i term connection among the financial companies and credit unions entire set.

To solve this problem the authors offer a geometric interpretation to determine the addiction type, whereas we must at the same time consider all the indicators, and their quantity number is three, then they are convenient to interpret in three dimensions, as shown in Fig. 1. Since the marked figures (indicators) can take different values, so the result will be shown as an obtained space figure - a parallelogram, where its main diagonal will determine the financial institutions credit risk assessment, so purposed the following formula:

$$L_{CR} = \sqrt{\left(\frac{1}{TD_j}\right)^2 + (CFI_k)^2 + (Z_i)^2}.$$

Since the financial institution's credit risk assessment is dynamic, i.e. changing through the time depending on changes in the marked figures (indicators), so it is transformed into the following formula:

$$L_{CR}^n = \sqrt{\left(\frac{1}{TD_j}\right)^2 + (CFI_k)^2 + (Z_i)^2},$$

where n is consideration period number.

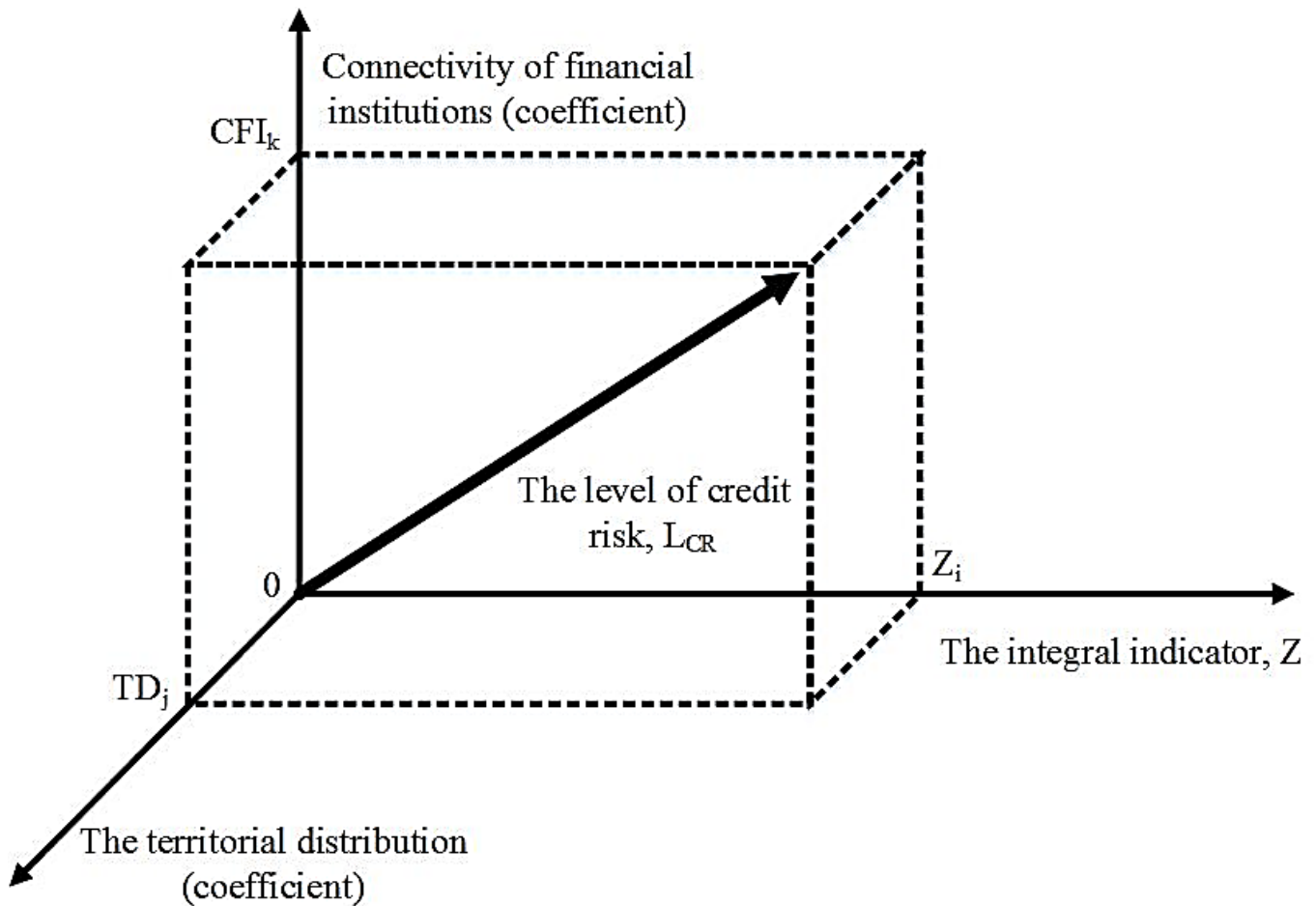


Fig. 1. Geometric interpretation in 3D as assessment dependence type of financial institutions loans risk from aforementioned figures (indicators)

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