Determining the factor of interaction of the risks in banking business and the establishment of the author's formula for its quantitative calculation

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Abstract

The beginning of the article indicates the view of the author, who says that "new thing" in nature, economics, finance, banking is perfectly forgotten "old", as it is established in the relation of the history, it is the future of invisible, unknown thing. In the relation of problem, it is also important to mention that a risk does not represent malice, but the risks, that are evaluated and managed wrongly are estimated in contrast to this.

The article reviews the existence of important interaction factors of the risks, acting at the same time in banking business and reflects author's formulas for its quantitative calculation. It is mentioned that calculation formulas of economic standards and limits of banking system simply summarize the risks acting at the same time and the important phenomenon of their impact on each other is not taken into consideration, as above mentioned issue is envisaged in the formulation of the calculation of the annual pace of inflation and the importance of quarterly interest rate. The author offers to eliminate the disadvantages in the formulas of calculation of banking standards which will strengthen the reliability of banking activities and improve the impact of risks.

If the methodology and formula is got after the calculation of the real volume of bank credit, each risk is directly affected by each other, that was followed by the correction of current methods, such as the consideration of the factor of interaction of risks operating simultaneously in calculation formulas of mandatory normatives of the central bank, methodology of determination of creditability by bank-partners according to Kromonovi V.S., estimation of the possible bankruptcy method of the borrower and enterprise according to Altman or Z-analysis.

Key Words: Financial risk, banking business, interest rate, inflation, credit.

Introduction

The monograph reviews the existence of important interaction factors of the risks, acting at the same time in banking business and reflects author's formulas for its quantitative calculation. It is mentioned that calculation formulas of economic standards and limits of banking system simply summarize the risks acting at the same time and the important phenomenon of their impact on each other is not taken into consideration, as above mentioned issue is envisaged in the formulation of the calculation of the annual pace of inflation and the importance of quarterly interest rate. The author offers to eliminate the disadvantages in the formulas of calculation of banking standards which will strengthen the reliability of banking activities and improve the impact of risks.

We want to pay attention to author's opinion **‘'News in nature, Economics, Finance, Banking is not only well forgotten old, as it relates to history, but also the future of the unseen, unknown thing".** It is also important to note that **"the evil is not the risk itself, but the only risk that is wrongly assessed and managed."**

We can have a big talk and discussion about the types of credit risk, its essence, classification, assessment methods and their reduction, but now our aim is to demonstrate how the credit risk analysis of the potential borrower is implemented and what special problem we have found out while evaluating it.

Typically, there are following types of risks: market risk, liquidity risk, operational risk, percentage risk, currency risk, business risk, settlement risk, legal risk, reputation risk, credit risk, world risk, regional risk, sector risk, customer risk, production risk, payment risk, project risk, provision risk and others.

The issues for effective management of the risks are raised in the first order, by the efforts of banking activity in bank management, in order to protect clients' interests and provide financial stability of the bank.

The risks, acting at the same time, play the main role in the assessment process of the activity and financial position of the bank. **Risk means - indefinition of future cash flows, the probability of total loss of loses or revenues presented in the depiction of value, compared to what is planned.**

Methods

The supervisory authorities use mandatory economic regulations and limits to regulate banking activity, including the purpose of restricting the impact of certain types of risks on it. At the same time, the norms of the risks, that determine their permissible limits have the greatest importance while considering the given problem. Let us consider practical examples (Tsaava., 2018:354):

1. Formula for the general norm of the bank's risk (N_p) is presented in this way, we want to mention that, here the Bank's allowable risk indicators (internal bank risks: structural, risk of banking customer, settlement, emission, criminal activities of the bank employees, active and passive operations and capital, i.e. balance, credit, interest, currency, refinancing, unbalanced liquidity, inadequate divertification of operations, i.e banking specialization risks) are summarized in the calculation formulas and an important factor of their influence is neglected, as the mentioned situation, monthly inflation rates are intended to influence each other in annual inflation rate calculation formulas (Tsaava., 2018:405):

$$Nr = (R1 + R2+ ... + Ri + … + Rn) \times E / K,$$

here: Nr – is the bank's permissible common risk level;
Ri – Bank's risks;
i – according to operations or risks considering weighted assets (i = 1, 2, … , n);
E – global risks (foreign risks);
K – bank's capital.

The criterion level of the total risk is within 10 units:

- N = (0 – 5) - is bank's low risk level, that can be ignored for some time;
- N = (5 – 10) – is average risk level, that requires diligent attention from banking institution;
- N = 10 - is high risk level, high benchmark can cause bankrupcy.

2. Economic norm for commercial banks kk1 (Primary capital coefficient) – considers that the bank's primary capital should be at least 8 percent of the weighted assets (3, page.282**), where the weighted assets according to the risks are just assembled (summarized).**

3. Economic norm for commercial banks kk2 (Supervisory Capital Coefficient) – considers that the bank's primary capital should be at least 12 percent of the weighted assets (Tsaava., 2018:408), where the weighted assets according to the risks are assembled (summarized) again.

As a result of deepening in above mentioned three examples-the formula for calculating the general norm of the bank's risk, the structure of formulas of economic regulations (kk1 da kk2) established for commercial banks, the author of the given article mentions that the credit risk values (R1 + R2+ ... + Ri + … + Rn) given in the formulas and the results of the risk weighted assets are simply summarized and the level of impact (phenomenon) directly on each other is not provided, as the mentioned inflation factor is derived in annual pace calculation formula $[(1 + r_{\text{ინ.}})^n - 1] \times 100\%$ (1, p. 48). For example, if monthly inflation is

generally 9% during the year, then the annual inflation will not be equal to (9% x 12 months) = 108%, but considering the impact of the monthly inflation values on each other, it will be:

$[(1 + r_{m.})^n - 1] \times 100\% = [(1 + 0,09)^{12} - 1] \times 100\% = (1,09^{12} - 1) \times 100\% =$

$= (2,813 - 1) \times 100\% = 1,813 \times 100\% = 181,3\%$

This means, that considering the impact of inflation rates of different months on each other during the year (rather than simply summarizing their values) the coefficient of real meaning will be (181,3 : 108) = multiple of 1,6

Even so, the monthly inflation rate of 9% in the country is unrealistic, the author formulates the schedule for the calculation of real annual inflation and growth coefficients considering the monthly inflation under the circumstances of 0,3-0.7 in Georgia and monthly inflations directly affectiong on each other (see Table 1).

Table 1. Information about the calculation of the real annual pace of inflation considering the impact of monthly inflations on each other

Monthly inflation %	Annual inflation is ($r_{m.}$ x 12) =	Annual inflation is formulated $[(1 + r_{m.})^{12} - 1] \times 100\% =$	Growing ratios Equal to:
Monthly inflation 0,3%	(0,3 x 12) = 3,6%	$[(1 + 0,3)^{12} - 1] \times 100\% =$ 4,26%	K = 4,26/3,6 = 1,2
Monthly inflation 0,4%	(0,4 x 12) = 4,8%	$[(1 + 0,4)^{12} - 1] \times 100\% =$ 6,01%	K = 6,01/4,8 = 1,3
Monthly inflation 0,5%	(0,5 x 12) = 5,0%	$[(1 + 0,5)^{12} - 1] \times 100\% =$ 7,56%	K = 7,56/5,0 = 1,3
Monthly inflation 0,6%	(0,6 x 12) = 7,2%	$[(1 + 0,6)^{12} - 1] \times 100\% =$ 10,12%	K = 10,2/7,2 = 1,4
Monthly inflation 0,7%	(0,7 x 12) = 8,4%	$[(1 + 0,7)^{12} - 1] \times 100\% =$ 12,52%	K = 12,52/8,4 = 1,5

The table shows that , the total size of different types of risks operating at the same time in the numerator of the formula should be increased at least 1,3 to 1,4 (multiple of 1,35), i.e 35 % according to the formula of Calculation of General Bank Risk Norm (N_r), considering the factor of impact of jointly operating risks of the bank on each other and the criterion level of admission will have the following look: 1) low level (Nr = 0 - 4) ; 2) an average level (Nr = 4 - 7), 3) high level (7 and more) .

The author offers correct calculation formula, considering the allowing quality of the bank's overall risk and interaction of different risks simultaneously acting according to the bank's operations, on the basis of which the value in the numerator of the formula will be increased by 35%. The mentioned formula will have the following look:

$Nr = [[(1 + ((R1 + R2 + ... + Ri) / i))^{12} - 1] \times 100] \times E / K$, (Version I**)**

here: Nr – the allowing quality of the bank's overall risk, considering the impact of jointly operating risks on each other;

Ri – Bank's risks; i – considering the operations or risk weighted assets

(i = 1, 2, … , n);

i – Total number of risks operating at the same time;

E – Global risks (foreign risks);

K – Bank's capital

The calculation formula of the volume of interests for using credit can also be used as a proof argument of modification of the given formula. It is known that the payment of interest (for using credit) is permitted monthly by individual entrepreneurs, and by legal entities - monthly or quarterly. Quarterly value from the monthly value of interest rate is calculated on the basis of the following formula:

$$J = [(1 + i / 12) \times 3 - 1] \times 4,$$

here: J – is annual interest rate during the quarterly payment of the interests;

i - is annaul interest rate during monthly payment of the interests, divided into 100.

Let's assume that monthly interest rate is equal to 2%, i.e = 0,02, then a payment for quarterly interest rate is not equal to (2 x 3) = 6%, but:

J = [(1 + 0,02 / 12) x 3 - 1] x 4 = [(1 + 0,0017) x 3 - 1] x 4 =

= [(1 + 0,0017) x 3 - 1] x 4 = (3,0051 - 1) x 4 = 2,0051 x 4 = 8,02%.

Therefore, considering the impact of quarterly (3 months) monthly interest rates on each other, growth coefficient will be equal to (8,02% : 6,0%) = 1,34. Thus, depending on the monthly rates of the interests, the formula of bringing down its quarterly base confirmed, according to the calculation formula of the annual inflation rate, the accuracy to increase monthly inflation by 35% and the identity of the result, i.e as a result of calculation, considering the impact of simultaneous risks on each other, its value must be increased from 1,3 to 1.4 (multiple of 1,35), i. e. increased by 35%. Therefore, the formula for calculating the general norm of the bank's risk may have the following look:

Nr = 1,35 x (R1 + R2+ ... + Ri + … + Rn) x E / K. (Version II)

If the methodology and formula are adopted during the calculation of the bank's real risk level offered by us, considering the impact of each of the risk factors, then the mentioned thing will be followed by adjusting existing methods, such as compulsory regulations established by the National Bank, as well as Cromonon V. According to the methodology of determining the solvency of bank-partners, according to alman or "Z analysis", the methodology of predicting possible bankruptcy of the enterprise-borrower, etc. It is advisable to take into consideration the factor of the interaction of risks operating at the same time in calculation formulas.

Results:

By considering the above, we can make the following conclusion:

1. It is estimated that, the values of credit risks are simply assembled (summarized) in the numerator of the formula given in this article during the calculation of the general norm of the bank's risk and the impact on each other is not provided, as such an important event, is confirmed in the calculation formulas of the annual inflation rate and adjusting the monthly interest rate to quarterly basis for using credit.
2. An adjusted formula for calculation of the total risk availability of the bank's risk is offered, where it is envisaged that the Bank's operations have different impacts on each other at the same time, based on which the value of the risks is increased at least by 35 % in the numerator of the formula and the above mentioned issue should be followed by adjusting the existing methodology and standards.

Nr = [[(1 + ((R1 + R2 + ... + Ri) / i))^{12} -1] x 100] x E / K . (Version I);

Nr = 1,35 x (R1 + R2+ ... + Ri + … + Rn) x E / K. (Version II).

Discussion

Consequently, we, on the basis of the tales of the two paragraphs at the beginning of this monograph: "detection of the existence of the present, but invisible and unknown factor “ and "the evil is not the risk itself, but the only risk that is wrongly assessed and managed" and considering the problems , can conclude that, all the compulsory banking standards, which calculation formulas only summarize the risks acting at the same time and do not consider the interaction factor. we consider the mentioned phenomenon, which will tightens the existing compulsory standards at least by 35% and therefore risk of banks will become real and the financial position and sustainability of the banking business will be regulated.

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