UDC 336.71
JEL CLASSIFICATION: E50

METHODS OF RISK ASSESSMENT OF CREDIT AND INVESTMENT BANKING BASED ON REGULATORY-INDEX MODEL

Serhiy V. DIDENKO
Senior Lecturer of Department of Banking of Cherkassy Institute of Banking of University of Banking of the National Bank of Ukraine

Vasyl V. SHL'ONCHAK
Student of magistracy of Cherkassy Institute of Banking of University of Banking of the National Bank of Ukraine

Анотація. Особливе місце в системі управління кредитними ризиками банків, що кредитують підприємства різних галузей економіки є розробка методики оцінки ризиків в умовах інформаційної невизначеності. Успішно розв'язувати зазначені проблеми можна лише за умови використання сучасних стратегій, методів і систем ризик-менеджменту. Одним із важливих є застосування методики визначення рівня ризиковості діяльності банку на ринку кредитування за допомогою методів непараметричної статистики.

Аннотация. Особое место в системе управления кредитными рисками банков, кредитующих предприятия различных отраслей экономики является разработка методики оценки рисков в условиях информационной неопределенности. Успешно решать указанные проблемы можно только при условии использования современных стратегий, методов и систем риск-менеджмента. Одним из важных является применение методики определения уровня риска деятельности банка на рынке кредитования с помощью методов непараметрической статистики.

Summary. The risk assessment methodology development in the information uncertainty takes a special place in the bank credit risk management system, while crediting the enterprises of the different sectors of economy. Successfully solve these issues can only be provided using modern strategies, techniques and systems of risk management. One of the most important is the application of the methodology for determining the level of riskiness of bank loans market by using methods of nonparametric statistics.

Ключові слова: *кредитна та інвестиційна діяльності банків, банківські ризики, індекс моделі, оцінка ризику.*
Ключевые слова: *кредитная и инвестиционная деятельности банков, банковские риски, индекс модели, оценка риска.*
Key words: *credit and investment banking, bank risks, regulatory-index model, risk assessment, dynamic standard.*

Today credit risk management is being considered not only in a coordinate system of relations between a bank and its customers. It is a dominant factor of regulating relationship of the loan and industrial capitals and largely is influencing on performance of using credit resources in distribution processes and in the real sector of economy.

Problem of risk management of the credit and investment bank activity is not new for theory and practice. Large numbers of works of domestic and foreign scientists are dedicated for solving that problem. There are considered conceptual issues of credit risks' management in terms of forecasted economic trends and moderate fluctuations of amplitude of market volatility. However consequences of financial and economical crisis 2008–2009 years caused rethinking of methodological basis of operational risks' component and strategy of formation of risk management system in side of analytics of qualitative and quantitative parameters of risk values of the credit and investment bank activity.

Crisis wave caused recession of the industrial sector and restrictive measures in the field of monetary regulation in 2008–2009 years. When volumes of industrial production had been reduced in comparable prices (in 2008 – by 3,1 %, in 2009 – by 22,9 %), bank

lending has been suspended.

The negative consequences of world financial crisis, which significantly weakened the domestic banking system, have detected unreadiness of majority of banks for operative and adequate adjusting the credit policy in direction of searching optimal relationship between credit needs of clients and credit risks, liquidity requirements, requirements for credit collateral of business entities in form of real assets, etc.

Lending of enterprises had been renovated by banks in 2010–2011years and problem of credit policy formation in conditions of overcoming of crisis consequences arose for the banks with a new sharpness. Development of risk assessment methodology in information uncertainty and markets' volatility occupies special place in system of the credit risk management of banks that lend companies in various sectors of the economy. Results of conducted by the Basel Committee experts analysis of causes of appearing the financial and economical crisis pointed to the number of reasons of using by banks inadequate models for risk assessment. Conclusions in field of financial management indicate that banks caused increasing of credit offers by extension of credit expansion. The rapid growth of lending resulted to decrease prices and to increase credit demand. This led to deterioration of quality of the risk management of the banks. The problem manifested in two aspects: methodological risks and level of professional competence of specialists of risk management of the banks.

Thus, such factors as problems, which arise in the process of internationalization and globalization on financial market, adaptation of the domestic banking to conditions of turbulence of the current economic relations and asymmetry of financial information are exacerbating the need of revision of tools for risks' assessment of the credit and investment banking.

Using of modern strategies, methods and systems of risk management will allow to successfully solve these problems. One of them is applying of method of determining level of riskiness of the bank activity in the credit market which based on using of methods of nonparametric statistics.

Investigating of the economical and mathematical methods for assessment risks of bank activity has been reflected in scientific writings of scholars such as D. Hryn'kov, A. B. Kaminskiy, H. Karcheva, L. Prymostka, G. M. Puriy, M. Frost and others domestic and foreign researchers. However, some features of evaluation of riskiness haven't fully been considered by the scientists. Thus, methodology of methods of nonparametric statistics for application regulatory-index model for assessment risks of the credit and investment banks activity is needing development.

So, bank risk is special kind of activity, because risk isn't only uncertainty but it is functioning of business entities under conditions of this uncertainty too. Bank's activity in the field of customer services closely relates with commodity risks. Feature of the bank risk, which closely relates with essence of banking, is that it reflects the process of production and circulation of the social product and parallel manifests itself in the sphere of exchange and the payment turnover. Practice shows, that bank risks in all their diversity reflect specific of activities of the credit institution. They arise as a result of its action or inaction, delay, premature or erroneous actions. In any case, their presence requires from the bank focused and planned activities. It must be not fragmented set of individual measures – it must be the system of the risk management [1, p. 27-28].

The risk assessment of bank's activity is carried out through variety of methods, each of which has characteristic advantages and properties. The most common methods are: financial ratios method; statistical methods for assessment the level of credit risk (method of statistical tests, method of Monte-Carlo, model CART); expert methods and using of regulatory-index model. In our opinion, using of the regulatory-index model is the most appropriate method of assessment the credit and investment risks, because methods of nonparametric statistics, which were used in this model, had yielded positive results in investigating of liquidity and solvency of the banks and determining level of their financial stability.

The essential elements of the dynamic regulatory-index model, that take into account the specific bank risks, are:

- System of indexes, which includes a set of significant correlations (coefficients, indexes, indicators, etc.) which comprehensively characterizes the riskiness of bank's activity;

- The dynamic standard which covers indicators sorted by growth rate. The compliance of this standard provides minimization the level of risk of activity of a bank;

- A reference model, which is based on ordered number of indexes of analytic coefficients. It reflects a formalized description of desired state of banking. It allows to assess the level of risk of this activity [2, p. 46].

The main advantages of the regulatory-index model, that make using of it reasonable and rational during the process of risk assessment of the credit and investment banks' activities, are:

- conducting of analysis of dynamics of indicators

and coefficients, which correlate with each other and reflect level of risk of the bank activity for an investigational period;

- providing the most accurate assessment of level of the risk of financial and credit institutions, which can't be obtained during studying of a single parameter or a coefficient.

A process of building of the dynamic regulatory model for assessment riskiness of the credit and investment banking consists of several stages and begins with selection procedure of parameters. The dynamic standard must be formed with according the results of this procedure.

In the process of building of the regulatory-index model, factors, during the calculation of which used indicators based on their importance for determining the level of riskiness of credit and investment banking, are included in the dynamic regulation. Among the factors, which were proposed by G. M. Puriy, we had selected the most significant ones (Table 1) and have supplemented this list by own indicators (Table 1) [2, p. 48].

Table 1

The list of indicators for building the dynamic standard for evaluation riskiness of the credit and investment banking

Indicator	Method of calculation	Marking
Equity	It's calculated as sum of the primary and the secondary capital of a bank	Eq
Total Assets	It's calculated as amount of the balance sheet assets	A
Reserves for credit risks	It's calculated as estimated value of the reserves for the credit risk	Rcp
Credit portfolio	It's calculated as sum of all granted loans by a bank	CP
Reserves for the risks of investments in securities	It's calculated as estimated value of the reserves for risks, which arose from the bank's investments in securities	Risc
Investments in securities	It's calculated as sum of all bank's investments in securities	ISC
Liabilities of a bank	It's calculated as sum of all bank's liabilities	L

During calculating value of the index "Crc", the interest rate costs must be replaced on price index of the credit resources. He must be calculated such as multiplying of actual average price of the attracted resources and the average volume of the credit operations:

$$C_{rc} = A_{rcr} \times \overline{C_r} \qquad (1)$$

where C_{rc} – the price of credit resources;
A_{rcr} – the actual average price of the attracted resources;
C_r – the average volume of the credit operations.

The interest rates for attracting each type of the resources are significantly different. Thus, calculating of the average price of the attracted resources such way as ratio of interest expenses for attracting of the resources to total volume of the resource base is not correct.

We advise to use the formula, which has been created by us, for calculating the actual average price of the attracted resources:

$$A_{rcr} = \left(\frac{C_i}{S_i}\right) \times w_i + \ldots + \left(\frac{C_n}{S_n}\right) \times w_n \qquad (2)$$

where C_i – the interest expenses for attracting "i" – type resource; S_i – sum of attracted "i" – type resource; w_i – an amount of "i" – type resource in total volume of the attracted resources; "n" – types of the attracted resources.

This formula takes into account the cost of each type of the involved resources. If calculation of the price index of the credit resources is objective, then calculation of volume of the credit operations will be the most accurate. The ways of calculating the indexes of profitability and expenses for attracting resources for securities' operations are analogical.

Table 2

*The list of indicators for building the dynamic standard for evaluation riskiness of the credit and investment banking**

Indicator	Method of calculation	Marking
Income from lending	It's calculated as amount of the interest income that was derived by a bank from lending	Ila
The costs for attracting resources for the credit activities	It's calculated as amount of the interest expenses for attracting resources which were used by a bank for granting loans	Crc
Income from securities transactions	It's calculated as amount of the interest income what was derived by a bank from securities transactions	Ist
The costs for attracting resources for securities transactions	It's calculated as amount of the interest expenses for attracting resources which were used by a bank for securities transactions	Crs
Change of the credit interest rate	It's calculated as difference between the average interest credit rate for reporting period and the credit interest rate for the previous period	Δ ic
Change of the deposit interest rate	It's calculated as difference between the average interest deposit rate for reporting period and the deposit interest rate for the previous period	Δ id
Resources for the credit and investment activities	It's calculated as amount of the attracted and borrowed resources that can used by bank for the credit and investment activities	Rcia
Total amount of the credit and investment activities	Total amount of CP and ISC	TICI
Total income from the credit and investment activities	Total amount of Ist and Ila	TIcia
The costs for attracting resources for the credit and investment activities	Total amount of Crc and Crs	Ccia
Reserves for the risks of investing in the credit and investment activities	Total amount of Rcp and Risc	Rici

** It was developed by the authors*

In the regulatory-index model, the indicators Δic and Δid were used for assessment the level of the interest rate risk of the credit and investment banking. They reflect changes in the credit and deposit interest rates. After comparing the values of these indicators, the level of the interest rate risk can be assessed by a researcher.

The indicator "TICI" differs from the indicator "Rcia" that not everyone involved and borrowed funds are used for carrying out the credit and investment operations, because part of them are saved for provisioning. If the level of the risk is moderate then following situation can be observed: Rcia > TICI.

In transition to the second stage of development of the dynamic model, correlation and logical relationships between the economic indicators should be reflected with taking into account the principle of economic feasibility during comparison of these indicators (Table 3 and Table 4). For example, if growth rate of volume of the provisions for the credit risks is highest than rate of growth of the credit portfolio, then this situation will indicate about increasing of the risk. If number of the different parameters is large, which are used in building of the model, then various aspects of the credit and investment banking will be taken into account fully. The coefficients, which were calculated, must reflect the level of riskiness of credit and investment operations of a bank. So objectivity of the results and feasibility of practical implementation of the model depend on the logical correlation and economic feasibility of the relationships that were established by a researcher.

The coefficients that have been proposed by G. M. Puriy for assessment riskiness of the credit and investment banking are presented in the Table 3. The coefficients that have been developed by us are presented in the Table 4.

Table 3

Analytical risk factors for assessment the credit and investment banking and the regulatory relationships between rates of their growth

Name of coefficient	Method of calculation	Regulatory changes of the relationships	The regulatory relationships between the rates of growth
Multiplier of the capital	mk = A / Eq	Decrease	A(i) < Eq (j)
Coefficient of riskiness of the credit portfolio	CRcp = Rcp / CP	Decrease	Rcp(i) < CP(j)
The share of the credit portfolio in total assets	Scp = CP/A	Decrease	CP(i) < A (j)
The share of the investments in securities in the total assets	Sisa = ISC/A	Decrease	ISC (i) < A (j)
Coefficient of the riskiness of the investments in securities	CRisc = Risc / ISC	Decrease	Risc (i) < ISC (j)
Factor of reliability	FR = Eq / L	Increase	Eq(i) > L (j)
Coefficient of riskiness of the investments in the credit portfolio	CRicp = Eq / CP	Increase	Eq(i) > CP (j)

Table 4

*Analytical risk factors for assessment the credit and investment banking and the regulatory relationships between rates of their growth**

Name of coefficient	Method of calculation	Regulatory changes of relationships	Regulatory relationships between the rates of growth
Coefficient of riskiness of investment in the portfolio of securities	CRips = Eq / ISC	Increase	Eq(i) > ISC (j)
Coefficient of transforming resources into the loans	Ctrl = CP / Rcia	Decrease	CP(i) < Rcia (j)
Coefficient of transforming resources into the investments	Ctri = ISC / Rcia	Decrease	ISC(i) < Rcia (j)
Total coefficient of transforming resources	TCtr = TICI / Rcia	Decrease	TICI(i) < Rcia (j)
Return on the credit operations	Rco = Ila / Crc	Increase	Ila(i) > Crc (j)
Return on securities transactions	Rst = Ist / Crs	Increase	Ist (i) > Crs (j)
The overall coefficient of return on the credit and investment operations	OCri = TIcia / Ccia	Increase	TIcia(i) > Ccia (j)
The coefficient of the interest rate risk	Cir = Δ ic / Δ id	Increase	Δ ic(i) > Δ id (j)
Factor of reliability 2	FR2 = Eq / Rcia	Increase	Eq(i) > Rcia (j)
The overall coefficient of riskiness of investments in the credit and investment portfolio	OCRicip = Eq / TICI	Increase	Eq(i) > TICI (j)
The overall coefficient of riskiness of the credit and investment portfolio	OCRcip = Rici / TICI	Increase	Rici(i) > TICI(j)

** It was developed by the authors*

The matrix of the preferences is formed according to the results of the revealed correlations between growth rates of the individual indicators. The preferences reflect the normative relationships between indicators, which are included to the regulatory-index model for determining of riskiness of the credit and investment banking (Table 5). The relationships, which were offered by us and by researcher Puri G. M., were taken into account during building of the matrices.

An each element of this matrix (bij) is defined as follows: if an "i" – parameter must grow faster than a "j" – parameter, then bij = 1; if the "i" - parameter must grow more slowly than the "j" – parameter, then bij = – 1; if the normative relationship between the "i" and "j" parameters isn't detected, then bij = 0. For example, the bank's equity should grow faster than the rate of growth of the assets for reducing the riskiness of the credit and investment banking. Taking into account this requirement, the number "one" (1) is put at the intersection of a row "№ 1" and a column "№ 3" of the matrix of preferences. And, conversely, the number "minus one" (-1) is put at the intersection of the column "№ 1" and of the row "№ 3", that indicates about the lower growth rate of the assets, compared with the growth rate of the equity. If the normative relationship between the growth rates is not set, then the number "zero" (0) will be placed at the intersection of the corresponding row and the column. This procedure is carried out for all eighteen the analytical risk factors of the banking [2, p. 48].

Table 5

*The matrix of preferences of the indicators for assessment the riskiness of the credit and investment banking**

	Eq	A	Rcp	CP	Risc	ISC	L	Ila	Crc	Ist	Crs	Δic	Δid	Rcia	TICI	TIcia	Ccia	Rici
Eq	0	1	0	1	0	0	1	0	0	0	1	0	0	1	1	0	0	0
A	-1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Rcp	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CP	-1	-1	1	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0
Risc	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0
ISC	-1	-1	0	0	1	0	0	0	0	0	0	0	0	-1	0	0	0	0
L	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ila	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Crc	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0
Ist	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Crs	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0
Δ ic	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Δ id	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0
Rcia	-1	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0
TICI	-1	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	1
TIcia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Ccia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0
Rici	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0

** It was developed by the authors based on the Tables 3 - 4*

The matrix of the normative ratios (the dynamic ratio) is constructed by ranking of the indexes. This procedure depends on the results of their pairwise comparison and ordering. The process of ranking the indexes involves using the results of constructing the matrix of preferences for assessment riskiness of the credit and investment banking. An each pair of the indicators for assessment riskiness of the credit and investment bankind is analyzed by researcher during formation of the dynamic standard. Then, an indicator, which must have the faster growth rate than other index, is detected between two compared indicators. After that, each of the selected indicators is compared with all others. When the indicator, which has the faster growth rate, is detected, then the comparison procedure will be stopped [3, p. 55]. However, not all indicators can be compared because they are very different. Therefore, the one of the two pos-

sible variants will be obtained according to the results of analysis of the dynamic ratios:

1) If all selected indicators can be uniquely interpreted and ranked according to their growth rates, then will be obtained a linear dynamic standard.

2) When not all pairwise comparisons of the indicators have the unambiguous economic interpretation, then will be obtained the non-linear dynamic standard, that is formed according to the results of building the matrix of the normative preferences [4, p. 35].

Therefore, not all selected ratios for evaluation riskiness of the credit and investment banking have been pairwise compared by us, then the integral assessment of the risk of the credit and investment bank's activity must be based on the results of formation the non-linear dynamic standard.

The matrix, which was formed, is a prototype of the ideal model for management of the risks of the credit and investment banking and formalized describes the normative procedure of changing of analytical coefficients, which characterize the credit and investment banking in dynamics (Table 6). And this matrix allows to analyze the level of deviation of these ratios from the normative value and to make a prediction of development of the current situation in future.

Table 6

The matrix of the normative correlations between the parameters for assessment riskiness of the credit and investment banking (the dynamic standard)

	Eq	A	Rcp	CP	Risc	ISC	L	Ila	Crc	Ist	Crs	Δic	Δid	Rcia	TICI	TIcia	Ccia	Rici
Eq	0	1	1	1	1	1	1	0	0	0	1	0	0	1	1	0	0	0
A	-1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Rcp	-1	-1	0	-1	0	0	0	0	0	0	0	0	0	-1	0	0	0	0
CP	-1	-1	1	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0
Risc	-1	-1	0	0	0	-1	0	0	0	0	0	0	0	-1	0	0	0	0
ISC	-1	-1	0	0	1	0	0	0	0	0	0	0	0	-1	0	0	0	0
L	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ila	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Crc	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0
Ist	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Crs	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0
Δ ic	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Δ id	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0
Rcia	-1	0	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0
TICI	-1	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	1
TIcia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Ccia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0
Rici	-1	0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	0	0	0

The rates of changes of the parameters for assessment the credit and investment activity must be calculated for each from selected banks. It allows realize an approbation of the dynamic normative model for evaluation riskiness of the credit and investment activity of the banks that uses the absolute values. Then must be formed a factual relationship between the analyzed indicators. For assessment we selected two bank's establishments, which are the PJSC "Privatbank" and the PJSC "Raiffeisen Bank Aval".

Indicators from the Table 8 must be ranked according to the growth rate for building the matrix of the factual relationships between the rates of changes the indicators. The main elements of this matrix are "fij". Therefore, if bi > bj, then fij = 1; if bi < bj, then fij = -1; if bi = bj, then fij = 0. Opportunities of logical tools of the Microsoft Excel 2007 were used by us for successful application of this economic and mathematical method. This complex of the logical tools allows operate large volume of data and provides possibility for using of the logical functions.

Table 7

Absolute values of the credit and investment activities of the PJSC "Privatbank" and of the PJSC "Raiffeisen Bank Aval" [5]

Indicators	Absolute values in billions of UAH							
	PJSC "Privatbank"				PJSC "Raiffeisen Bank Aval"			
	2012	2011	2010	2009	2012	2011	2010	2009
Eq	18301	16747,9	11871	10271	8069,5	7773,9	7158,03	6801,7
A	152013	128422,4	113437	86066	51202,6	54255,9	56791,6	55871,3
Rcp	25235	22130	16470	13377	9916,36	12288,7	12083,3	9597,3
CP	115604	99484	91212	74992	31765,14	33984,4	34255,3	48724,5
Risc	3,186	4,345	11,933	14,797	1,076	10,809	10,482	8,508
ISC	1272,5	1633,56	1272,6	1241,6	8051,9	9653,9	10500,8	2978,3
L	154128	128371	101557	75795	41348	44876	48659	48735
Ila	18577	17971,3	14769	14347	5132,7	5097,6	6112,1	7449,1
Crc	8849	8303,9	8320	7981,8	1667,6	159,627	2123,4	3094,4
Ist	80,030	120,126	70,504	84,971	861,6	1106,73	810,62	263,14
Crs	97,408	136,352	172,38	132,153	422,7	453,45	650,91	249,4
Δ ic	- 2	1,9	- 2,9	1,7	1,29	- 2,94	2,54	1,9
Δ id	- 0,7	- 0,77	- 1,52	1,1	0,55	- 1,5	- 1,14	1,5
Rcia	134358	110977	96882	65338	40629,9	44006,6	47111,73	44215
TICI	116877	101117,5	92485	76234	39817	43638,3	44756,1	51702,8
TIcia	18657	18091,42	14840	14431,92	5994,3	6204,3	6922,8	7712,2
Ccia	8946,4	8440,213	8492,3	8113,96	2090,3	2049,7	2774,3	3343,8
Rici	25238	22134,34	16482	13391,63	9917,4	12299,5	12093,8	9605,8

Table 8

The growth rates of the credit and investment activities of the PJSC "Privatbank" and of the PJSC "Raiffeisen Bank Aval"

Indicators	The relative values					
	PJSC "Privatbank"			PJSC "Raiffeisen Bank Aval"		
	2012/2011	2011/2010	2010/2009	2012/2011	2011/2010	2010/2009
Eq	1,09	1,41	1,16	1,04	1,09	1,05
A	1,18	1,13	1,32	0,94	0,96	1,02
Rcp	1,14	1,34	1,23	0,81	1,02	1,26
CP	1,16	1,09	1,22	0,93	0,99	0,70
Risc	0,73	0,36	0,81	0,10	1,03	1,23
ISC	0,78	1,28	1,02	0,83	0,92	3,53
L	1,20	1,26	1,34	0,92	0,92	1,00
Ila	1,03	1,22	1,03	1,01	0,83	0,82
Crc	1,07	1,00	1,04	1,04	0,75	0,69
Ist	0,67	1,70	0,83	0,78	1,37	3,08
Crs	0,71	0,79	1,30	0,93	0,70	2,61
Δ ic	-1,05	-0,66	-1,71	-0,44	-1,16	1,34
Δ id	0,91	0,51	-1,38	-0,37	1,32	-0,76
Rcia	1,21	1,15	1,48	0,92	0,93	1,07
TICI	1,16	1,09	1,21	0,91	0,98	0,87
TIcia	1,03	1,22	1,03	0,97	0,90	0,90
Ccia	1,06	0,99	1,05	1,02	0,74	0,83
Rici	1,14	1,34	1,23	0,81	1,02	1,26

Table 9

The matrix of the factual relationships between the indicators for assessment the credit and investment activity of the PJSC "Privatbank" in 2012

	Eq	A	Rcp	CP	Risc	ISC	L	Ila	Crc	Ist	Crs	Δic	Δid	Rcia	TICI	TIcia	Ccia	Rici
Eq	0	-1	-1	-1	1	1	-1	1	1	1	1	1	1	-1	-1	1	1	-1
A	1	0	1	1	1	1	-1	1	1	1	1	1	1	-1	1	1	1	1
Rcp	1	-1	0	-1	1	1	-1	1	1	1	1	1	1	-1	-1	1	1	1
CP	1	-1	1	0	1	1	-1	1	1	1	1	1	1	-1	1	1	1	1
Risc	-1	-1	-1	-1	0	-1	-1	-1	-1	1	1	1	-1	-1	-1	-1	-1	-1
ISC	-1	-1	-1	-1	1	0	-1	-1	-1	1	1	1	-1	-1	-1	-1	-1	-1
L	1	1	1	1	1	1	0	1	1	1	1	1	1	-1	1	1	1	1
Ila	-1	-1	-1	-1	1	1	-1	0	-1	1	1	1	1	-1	-1	1	-1	-1
Crc	-1	-1	-1	-1	1	1	-1	1	0	1	1	1	1	-1	-1	1	1	-1
Ist	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	1	-1	-1	-1	-1	-1	-1
Crs	-1	-1	-1	-1	-1	-1	-1	-1	-1	1	0	1	-1	-1	-1	-1	-1	-1
Δ ic	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	-1
Δ id	-1	-1	-1	-1	1	1	-1	-1	-1	1	1	1	0	-1	-1	-1	-1	-1
Rcia	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
TICI	1	-1	1	-1	1	1	-1	1	1	1	1	1	1	-1	0	1	1	1
TIcia	-1	-1	-1	-1	1	1	-1	-1	-1	1	1	1	1	-1	-1	0	-1	-1
Ccia	-1	-1	-1	-1	1	1	-1	1	-1	1	1	1	1	-1	-1	1	0	-1
Rici	1	-1	-1	-1	1	1	-1	1	1	1	1	1	1	-1	-1	1	1	0

Table 10

The matrix of the factual relationships between the indicators for assessment the credit and investment activity of the PJSC "Raiffeisen Bank Aval" in 2012

	Eq	A	Rcp	CP	Risc	ISC	L	Ila	Crc	Ist	Crs	Δic	Δid	Rcia	TICI	TIcia	Ccia	Rici
Eq	0	1	1	1	1	1	1	1	-1	1	1	1	1	1	1	1	1	1
A	-1	0	1	1	1	1	1	-1	-1	1	1	1	1	1	1	-1	-1	1
Rcp	-1	-1	0	-1	1	-1	-1	-1	-1	1	-1	1	1	-1	-1	-1	-1	1
CP	-1	-1	1	0	1	1	1	-1	-1	1	1	1	1	1	1	-1	-1	1
Risc	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	1	1	-1	-1	-1	-1	-1
ISC	-1	-1	1	-1	1	0	-1	-1	-1	1	-1	1	1	-1	-1	-1	-1	1
L	-1	-1	1	-1	1	1	0	-1	-1	1	-1	1	1	-1	1	-1	-1	1
Ila	-1	1	1	1	1	1	1	0	-1	1	1	1	1	1	1	1	-1	1
Crc	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
Ist	-1	-1	-1	-1	1	-1	-1	-1	-1	0	-1	1	1	-1	-1	-1	-1	-1
Crs	-1	-1	1	-1	1	1	1	-1	-1	1	0	1	1	1	1	-1	-1	1
Δ ic	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	-1
Δ id	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	1	0	-1	-1	-1	-1	-1
Rcia	-1	-1	1	-1	1	1	1	-1	-1	1	-1	1	1	0	1	-1	-1	1
TICI	-1	-1	1	-1	1	1	-1	-1	-1	1	-1	1	1	-1	0	-1	-1	1
TIcia	-1	1	1	1	1	1	1	-1	-1	1	1	1	1	1	1	0	-1	1
Ccia	-1	1	1	1	1	1	1	1	-1	1	1	1	1	1	1	1	0	1
Rici	-1	-1	-1	-1	1	-1	-1	-1	-1	1	-1	1	1	-1	-1	-1	-1	0

The procedure of comparison of the factual relationships between the indicators of the credit and investment banking with their normative values allows determine the level of compliance of real development of a situation to ideal. The general assessment of riskiness of the credit and investment banking is formed according to the number of the detected deviations. For example, eij – are the elements of matrix which has been built depend on the compliance of the factual and normative relationships between the growth rates of the indicators of the credit and investment banking. If eij = fij = 1, then dij = 1; if eij = fij = -1, then dij = 1; and in others happens dij = 0.

Table 11

The matrix of the compliance of the factual and normative relationships between the indicators for assessment the riskiness of the credit and investment activity of the PJSC "Privatbank" in 2012

	Eq	A	Rcp	CP	Risc	ISC	L	Ila	Crc	Ist	Crs	Δic	Δid	Rcia	TICI	TIcia	Ccia	Rici
Eq	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0
A	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Rcp	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
CP	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Risc	1	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
ISC	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ila	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ist	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Δ ic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Δ id	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rcia	0	0	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0
TICI	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
TIcia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ccia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rici	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0

Table 12

The matrix of the compliance of the factual and normative relationships between the indicators for assessment the riskiness of the credit and investment activity of the PJSC "Raiffeisen Bank Aval" in 2012

	Eq	A	Rcp	CP	Risc	ISC	L	Ila	Crc	Ist	Crs	Δic	Δid	Rcia	TICI	TIcia	Ccia	Rici
Eq	0	1	1	1	1	1	1	0	0	0	1	0	0	1	1	0	0	0
A	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Rcp	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
CP	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Risc	1	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
ISC	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
L	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ila	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ist	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Δ ic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 12 (continuation)

	Eq	A	Rcp	CP	Risc	ISC	L	Ila	Crc	Ist	Crs	Δic	Δid	Rcia	TICI	TIcia	Ccia	Rici
Δ id	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rcia	1	0	1	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0
TICI	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
TIcia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ccia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rici	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0

The total level of the regulatory (not - risky) credit and investment activities of the selected banks has been calculated by us with using of a formula № 3. The level of the regulatory activities of the banks is calculated like dividing of the total amount of all elements the matrix of compliance of the factual and normative relationships of the indicators for assessment riskiness of the banks' activities by the total amount of the elements of the matrix of the dynamic standard. This approach allows evaluate the level of compliance the factual relationships between changes of the indicators of the credit and investment banking with their regulatory values [2, p. 53].

$$Z = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} d_{ij}}{\sum_{i=1}^{n}\sum_{j=1}^{n} \left| e_{ij} \right|} \qquad (3)$$

where Z – the coefficient of the regulatory (not – risky) credit and investment bank's activities;
d_{ij} – the elements of the matrix of compliance of the factual and normative relationships between the change rates of indicators; e_{ij} – the elements of the matrix of the normative relationships between the change rates of the indicators; *i, j* – the serial numbers of the indicators in the dynamic standard.

The coefficient of the regulatory (not – risky) credit and investment activity of the PJSC "Privatbank" has following values:

Z_{2012}=30/51=0,5882;
Z_{2011}= 36/51=0,7059;
Z_{2010}= 25/51=0,4902.

The coefficient of the regulatory (not – risky) credit and investment activity of the PJSC "Raiffeisen Bank Aval" has following values:

Z_{2012}=30/51=0,5882;
Z_{2011}= 36/51=0,7059;
Z_{2010}= 25/51=0,4902.

If the real state of the bank's activity nears to ideal, then the value of the coefficient "Z" will equal to the number "1". Namely, the factual rates of changes of the indicators' values will equal to the regulatory values.

The formula, which had been created and was offered by us, must be use for determining the level of riskiness of the credit and investment bank's activities. This formula is presented:

$$R_n = \left(1 - Z_n\right) \times 100\% \qquad (4)$$

where R – the level of the credit and investment bank's risk; Z – the coefficient of riskiness of the credit and investment bank's activity; n – the year of investigation of the level of credit and investment bank's riskiness.

The level of the credit and investment risk of the researched banks was calculated by us:

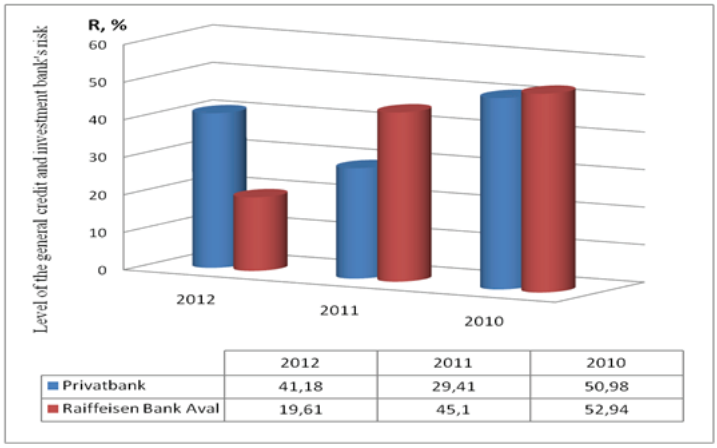
- the value of the coefficient "R" for the PJSC "Privatbank":

R_{2012} = (1- 0.5882) ×100 % = 41,18 %;
R_{2011} = (1- 0.7059) ×100 % = 29,41 %;
R_{2010} = (1- 0.4902) ×100 % = 50,98 %.

- the value of the coefficient "R" for the PJSC "Raiffeisen Bank Aval":

R_{2012} = (1 - 0,8039)×100 % = 19,61 %;
R_{2011} = (1- 0.5490)×100 % = 45,1 %;
R_{2010} = (1- 0.4706)×100 % = 52,94 %.

The dynamic of level of the credit and investment risk of the researched banks has been presented on the picture 1.



	2012	2011	2010
Privatbank	41,18	29,41	50,98
Raiffeisen Bank Aval	19,61	45,1	52,94

Picture 1. The dynamics of the credit and investment risk of the PJSC «Privatbank» and the PJSC "Raiffeisen Bank Aval" for the period 2010-2012 years

We have analyzed the activities of the investigated banks and can assert that the highest level of the credit and investment risk of the "PrivatBank" was determined in 2010, and the lowest level of it was in 2011. The activity of the "Raiffeisen Bank Aval" was the least risky in 2012, and the most risky activity was in 2010.

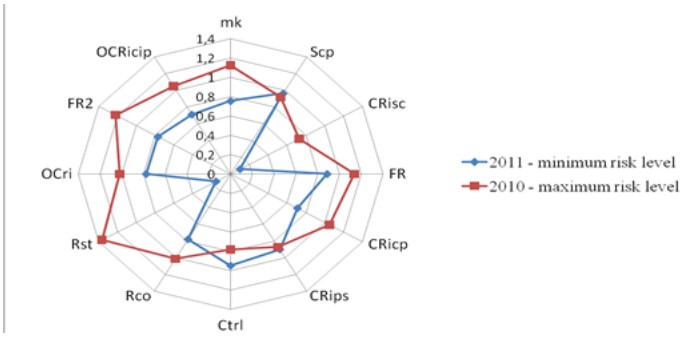
The next level of investigation is comparison of the banks' activity periods, which have the highest and lowest risk extent. For its realization, we determined the risk level for the each coefficient, which describes the bank establishment activity. The calculations based on the results of applying the next formula:

$$Rc_n = 2 - Zc_n$$

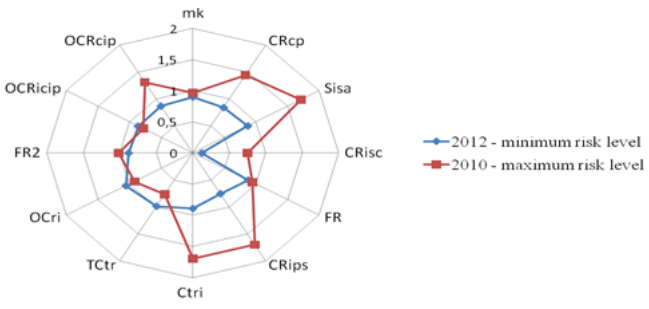
where RC_n – the risky extent of "n" - coefficient, ZC_n – the level of compliance of its value to the standard.

However, some coefficients can have the value of the index "ZC_n" higher then the number "1". Thus, the minuend has the value "2" in this mathematical expression.

The results of comparison the banks' activities with the different risk extents have been presented on the pictures № 2–3:



Picture 2. The comparative diagram of the highest and lowest levels of the risk of the PJSC "Privatbank"



Picture 3. The comparative diagram of the highest and lowest levels of the risk of the PJSC "Raiffeisen Bank Aval"

Thus, we analyzed the level of riskiness of the credit and investment activities of the researched banks and the results of the formed matrices of compliance. So, we are presenting main types of the risks, which were inherent for the banks activities, in Tables 13–14. We have determined the coefficients which indicate about presence of some types of the risks in these tables too.

Table 13

The main types of the risks, which were inherent for activity of the PJSC "Privatbank" during the whole investigational period

Risk	2010		2011		2012	
	Availability of risk	Coefficients	Availability of risk	Coefficients	Availability of risk	Coefficients
The operational risk	+	mk	-	-	+	mk
The credit risk	+	CRcp,CRicp	+	CRcp	+	CRicp
The investment risk	-	-	+	Sisa	-	-
The liquidity risk	+	FR, FR2	+	Ctri	+	FR
The risk of unprofitable activity	+	Rco, Rst, OCri	-	-	+	Rco, Rst, OCri
The interest risk	-	-	-	-	-	-
The credit and investment risk	+	OCRicip, OCRcip	+	OCRcip	+	OCRicip

Table 14

The main types of the risks, which were inherent for activity of the PJSC "Raiffeisen Bank Aval" during the whole investigational period

Risk	2010		2011		2012	
	Availability of risk	Coefficients	Availability of risk	Coefficients	Availability of risk	Coefficients
The operational risk	-	-	-	-	-	-
The credit risk	+	CRcp	+	CRcp, Scp	-	-
The investment risk	+	Sisa, CRisc	+	CRisc	+	CRisc
The liquidity risk	+	Ctri, FR2	+	Ctrl, TCtr	+	Ctrl, FR2
The risk of unprofitable activity	-	-	-	-	+	Rco, Rst, OCri
The interest risk	-	-	+	Cir	-	-
The credit and investment risk	+	OCRcip	+	OCRcip	-	-

We conducted additional stage of the analysis for determining main causes of the highest level of riskiness of the banks' activities. The compliance, between the coefficients and the factors, which influences to negative development of the bank's situation, was set by us. These are such factors as an inefficient bank management, an incompetent bank staff and destructive phenomena in the economy. Thus, the inefficient bank management leads to the irrational distribution of the attracted resources and to discrepancy of a bank activity to the optimal values of the economic standards. The next factor is the incompetent bank staff. Low quality of bank officers' qualification leads to the unobjective evaluation of the borrowers' creditworthiness and to the inefficient investments. Negative trends in stock and capital markets together with other destructive phenomena in the economy destabilize the bank activity and decrease clients' trust to it.

Correlations between the coefficients and the factors have been presented in the Table 15.

Table 15

The table of correlations between the coefficients of risks and the factors of influence to activity of the investigated banks

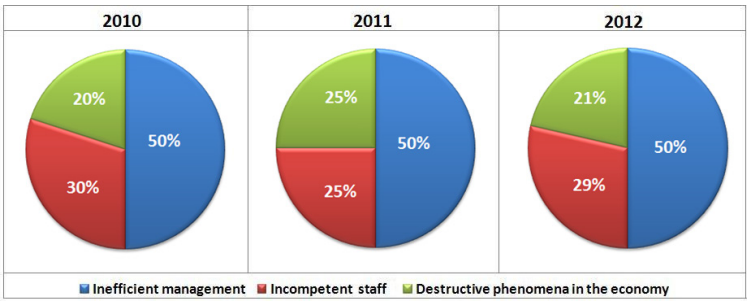
Factors of influence	The coefficients of riskiness of the bank's activities
Inefficient bank management	mk, CRcp, Scp, Sisa, CRisc, FR, CRicp, CRips, Ctrl, Ctri, TCtr, Rco, Rst, OCri, Cir, FR2, OCRicip, OCRcip.
Incompetent bank staff	CRcp, CRisc, Rco, Rst, OCri, OCRicip, OCRcip.
Destructive phenomena in the economy	CRcp, CRisc, Ctrl, Ctri, TCtr, Rco, Rst, OCri, Cir.

The level of dependence riskiness of the banks' activities from the influencing factors has been calculated with using the next formula.

$$LF_n = \frac{CF_n}{CF_{BM} + CF_{BS} + CF_{DFE}} \times 100\% \qquad (6)$$

where LF_n – the level of dependence the riskiness of the bank's activities from the influencing factors, CF_n – number of the risk coefficients, which were having negative values during the studying year and have connection with factor "n", CF_{BM} – factor of the inefficient bank management, CF_{BS} – factor of the incompetent bank staff, CF_{DFE} – factor of the destructive phenomena in the economy, $CF_{BM}+CF_{BS}+CF_{DFE}$ – the sum of all factors, which have connection with all coefficients of riskiness, which were having the negative values during an investigational year, n – any factor of these three factors.

The extent of influence of the main factors, which had caused increasing of banks' activity riskiness, has been presented on the pictures № 5–6.



Picture 5. The percentage of the main influence factors to the level of riskiness of the PJSC "Privatbank" activity during the whole investigational period

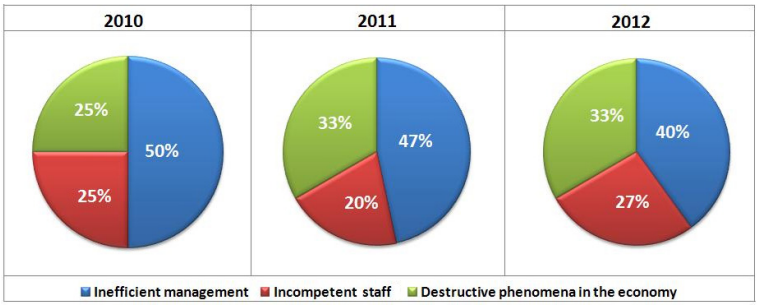
We can offer some conclusions:

- First of all, the negative tendencies of crisis phenomena's development in the activity of the "PrivatBank" have been caused by the inefficient bank management. The level of it influence was equaling to 50 % during all studying period.

- The influence's extent of the incompetent bank staff was fluctuating from 25 % to 30 %.

These factors contribute to increasing of loss probability of the active bank operations and worsening of its stable performance.

- The destructive phenomena in the economy make up 20 % – 25 % of influence level of factors on the bank's riskiness activity.



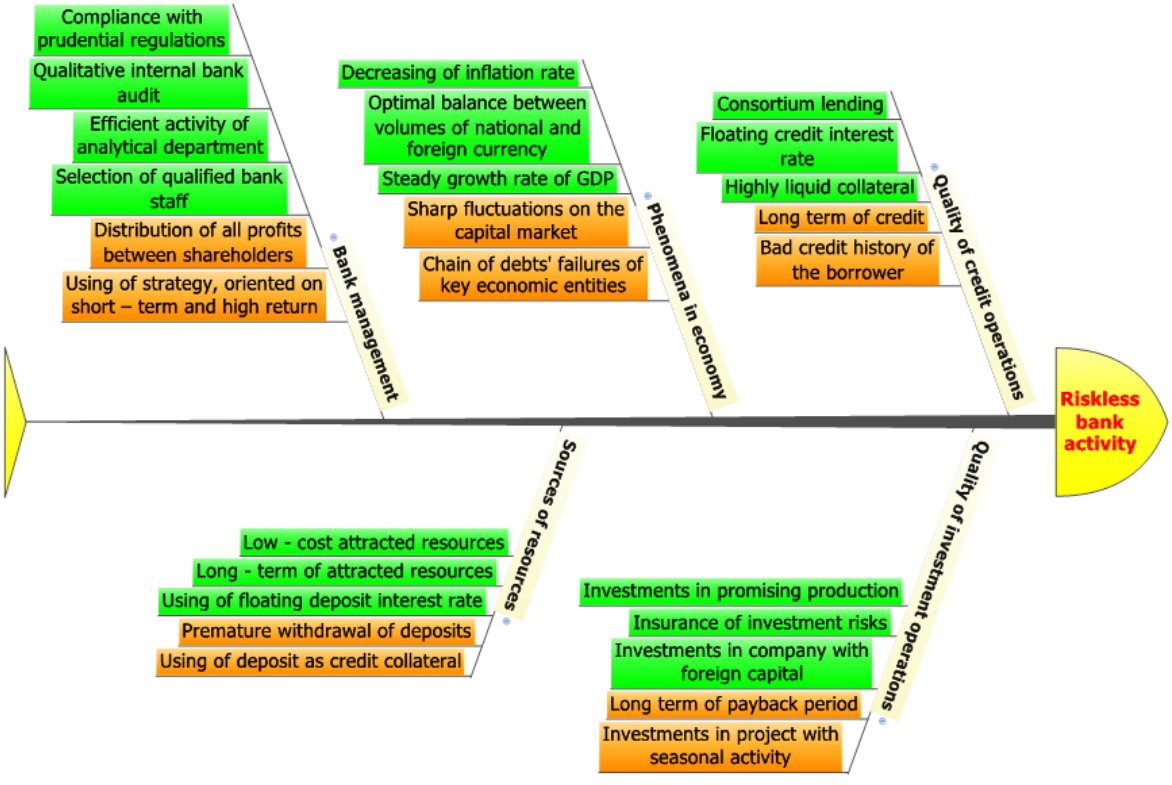
Picture 6. The percentage of the main influence factors to the level of riskiness of the PJSC "Raiffeisen Bank Aval" activity during the whole investigational period

Thus, we can assert that founding and developing of the crisis phenomena in activity of the PJSC "PrivatBank" have mainly been resulted by the incompetent staff and the inefficient management style. The level of influence of these factors represents more than half.

We can offer to consideration some points, after analyzing dependence of the riskiness activity of the "Raiffeisen Bank Aval" from the described factors. The level of the inefficient bank management's influence was demonstrating the tendency of decreasing during the whole investigational period. However, the extent of its influence was unacceptable and was fluctuating from 50 % in 2010 to 40 % in 2012. According to the influence's degree, the next factor is the destructive phenomena in the economy. The value of it was ranging from 25 % at the beginning of studying period to 33% in 2011. Such value of this factor was maintaining during 2012 year. The impact level of the incompetent bank staff demonstrated stick – slip dynamics. The value of it dropped markedly from 2010 to 2011 and reached it's the lowest level, which equaled to 20 %. In 2012, the extent of influence of this factor experienced sharp increase to 27 %.

Taking into account main points and results of our investigation we have built a Fishbone diagram, which are presented on the picture № 7. This construction describes the main factors, which influence the general level of riskless of a bank activity. Each factor has some causes, which are the root cause of changing the credit and investment bank's activity. The causes, which have positive influence, are marked by green color. The causes, which have destructive impact, are marked by yellow color. Thus, if the bank management purposefully regulates the current state of these factors, then the banking will be more effective and low – risky.

This set of the factors has been grouped by us after analysis of the selected banks' activity. Thus, it can be used by managers of any commercial banks of Ukraine for improving the extent of efficiency of its performance.



Picture 7. The Fishbone diagram of causes and factors of the riskless activity of the investigated banks

After conducted the deep and many - sided analysis of the banks' performance, we offer to consideration main points and conclusions. They are presented in the Tables № 16–17, which had been built such as cause and effect schemes. These schemes describe processes of functioning of the selected banks during the whole investigational period.

Table 16

Cause and effect scheme of activity of the PJSC "Privatbank"

Causes	Influence on the bank's activity	Results
2010		
Activity of the bank management: Negative: - The volumes of assets and liabilities have disproportionate been increased compared with the bank capital volume;	- Increasing the probability of delayed banking payments to the depositors; - Decreasing of the bank liquidity.	Negative: - There was a threat of destabilization of the bank's activity; - There were escalation of risks like the liquidity risk, the credit and investment risk, the operational risk; - The highest extent of the general credit and investment risk of the bank has been registered.
- The resources have been attracted from high - value sources; - A forecast of changes in the capital market has not been conducted; - The unobjective bank's price policy has been conducted. *Phenomena in the economy:* Negative - The price fluctuations have occurred on the capital market.	- The income level of the credit and investment activity was increasing more slowly than the costs level of its realization.	
Activity of the bank staff: Negative - The loans have been granted for ineffective legal entities; - The investments in unpromising issuers.	- Reserves for the credit and investment operations were increasing more rapidly than volume of credit and investment portfolio.	
2011		
Activity of the bank management: Negative: - The tendency of unreliable forecasting of the price changes on the capital market has been saved and deepened;	- The growth rate of the price risk significantly enlarged compared with the previous year;	Positive: - There was the lowest extent of the total credit and investment risk. The value of its was 29,41%; - The risk of the unprofitable activity and the operational risk have been liquidated; - The probability of realization other kinds of the risks has significantly decreased. Negative: - The level of the investment risk arose.
- Inefficient granting loans and investment were being continued by the bank management.	- The situation of sharp increasing the credit and investment reserves was continuing like in 2010 year.	
Positive: - The bank's price policy has been improved;	- The growth rate of profitability of the credit operations was higher than the growth rate of its costs;	
- Accordance between volume of the bank capital and liabilities' volume has been improved.	- The volume of the bank capital has been increased.	
2012		
Activity of the bank management: Negative: - The problem of insufficient bank capital volume has been restored;	- The growth rates of the assets, liabilities and the credit and investments operations outpaced the growth rate of the bank capital;	Positive: - The investment risk has been leveled. Negative: - The levels of the operational and unprofitable risks have significantly risen; - The general extent of the credit and investment risk of the Bank has been 41,18%.
- The costs' volume of the credit and investments operations has been increased;	- The level of yields and spending of the credit and investment operations was not balanced;	
- The unreasonable bank price policy has reached a peak.	- The extent of the interest risk has reached of its maximum level for the whole investigational period.	
Positive: - The riskiness of the credit and investment operations has been decreased.	- The correlation between volume of the credit and investment operations and of its reserves has been balanced.	

Table 17

Cause and effect scheme of activity of the PJSC "Raiffeisen Bank Aval"

Causes	Influence on the bank's activity	Results
2010		
Activity of the bank management: Negative: - The insufficient volume of the bank capital was accompanied with excessive growth rates of the credit and investments operations;	- The volumes of the lending and the investments were growing more faster than the volume of the bank capital;	Negative: - There was the highest extent of the general credit and investment risk. The value of its was 52,94%; - Threats of increasing the liquidity and the credit and investment risks have appeared.
- Unpromising ways for the lending and investments has been selected.	- The reserves for the credit and investment operations were increasing more rapidly than the volume of the credit and investment portfolio.	
2011		
Phenomena in the economy: Negative - Hard conditions of borrowers' activity decreased level of their creditworthiness.	- The volume of the reserves for the credit and investment operations has enlarged;	Positive: - The coefficient of resources' transformation was improved; - The level of credit and investment bank riskiness went down to 45,1%.
Activity of the bank management: Negative: - Tendency of irrational lending and investment was continued.		
- The forecast of changes in the capital market was not carried out;	- The growth rate of the interest rate risk significantly grew compared with the previous year;	
Positive: - The volume of the resources for carrying out the active operations was expended more objectively.	- The amount of high - risky investments was decreased in the total volume of the assets.	
2012		
Activity of the bank management: Positive: - The volume of the bank capital was increased;	- The liquidity bank coefficients were equaled to the standards;	Positive: - The threats of the credit and investment and interest risks were liquidated; - The lowest extent of the general credit and investment risk was registered. The value of its was 19, 61%.
- The level of general coefficient of resources' transforming was regulated according to the standards;		
- The quality of the credit and investment operations was significantly improved.	- The growth rate of the reserves was rising more slowly than volume of portfolio of the credit and investment operations.	

So, after thorough and detailed evaluation the riskiness of the banks' activity, we advise actual recommendations for improving of their activity. The average risk extent of activity of the PJSC "Raiffeisen Bank Aval" is lower (39, 16 %) than of the PJSC "Privatbank" (40, 52 %). Performance of PJSC "Raiffeisen Bank Aval" is characterized restoring of normal regime of functioning. The investigational post crisis period was not easy for Ukrainian economy in general and the banking system in particular. Nevertheless, due to the prudent policy of the management of the PJSC "Raiffeisen Bank Aval" it overcame the challenges of this period and restored stable own activity. The essential results for the 2010–2012 years are evidence of the fact that compared to the PJSC "Privatbank", the PJSC "Raiffeisen Bank Aval" was able to protect its clients' savings and was advocating their interests. During the investigational period, the bank was following a conservative policy in evaluation of the credit and investment risks and grew resources for the active operations. Thus, we recommend to continue chosen by the bank policy.

The results of the PJSC "Privatbank" performance were unsatisfactory in the field of risk-management.

We recommend to enlarge volume of the bank capital and to conduct more prudent the credit and investment activities. Thus, probability of borrowers' loan defaults will decrease. Besides, highly qualified and thoroughly formed the bank staff will provide lending and investment on an objective basis. These measures in turn will lead to improving of the quality of the credit and investment portfolio. As well as we advise to review main provisions and priorities of the pricing strategy of the bank. Using of the resources from low-cost sources will result to increasing of the profitability of its activity. So, if the bank management follows to these recommendations then the level of riskiness of its activity will be within the normal limits.

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