“The integration of the banking, insurance and reinsurance markets in Russia and Ukraine”

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The integration of the banking, insurance and reinsurance markets in Russia and Ukraine

Abstract

The article offers the indicator of the general level of integration (quantitative estimation of convergence) of the banking, insurance and reinsurance markets as a result of integration processes by identifying the numerical values of this indicator with subsequent qualitative interpretation on the basis of binary data.

Keywords: the level of integration, banking, insurance and insurance markets, binary data.
JEL Classification: G10, G15.

Introduction

Under current conditions of development of the banking, insurance and reinsurance markets one of the leading trends identified by researchers is the integration, which is the result of the functioning markets that require more reliable connections and elimination of obstacles to obtaining the best results.

The study of market integration is carried out by scientists representing different schools of economic theory. We would like to highlight the works of the following authors:

- W. Repke and M. Allen (neo-liberalism: the concept of integration is treated as a process of market consolidation on a scale of several participating countries; the functioning of this market space is based on the impact of the market forces and free competition; the dependence on the countries' economic policies and legislative acts is not considered; the influence of the state on economic relations entails negative consequences);
- B. Balassa (late neoliberalism: the process of integration is based on economic and political factors; the impact of integration on state participation in the economy);
- S. Rolf and J. Rostow (representatives of corporatism, which considers rational and effective development while the integration of the economy is influenced by transnational corporations);
- G. Myrdal (structuralism: negative perception of the integrated markets' liberalization; integration is described by profound economic transformations in order to create new big business entities);
- R. Cooper (neo-Keynesianism: the process of integration is possible provided that the optimal coordination of internal and external market policies is observed in order to preserve the benefits of the close interaction and ensure the highest possible levels of freedom);
- J. Tinbergen (dirigism: integrating markets should maintain the coordinated economic policy; the denial of the market mechanism as the main factor of integration);
- N. Shmelev (the process of integration should be characterized by inter-state economic regulation, establishment of economic and financial institutions with common proportions and structure, elimination of restraints, achievement of equal development levels of integrating countries);
- Y. Shishkov (integration is based on market mechanisms; finances and credit are the most sensitive area of integration).

Currently there are several integrated global associations, namely:

- political and economic models (the European Union, the Andean Group in Latin America, the Caribbean "common market" in Latin America, the Association of South-East Asian Nations);
- economic and trade cooperation models (the European Free Trade Association, the North American Integration of the United States, Canada and Mexico, the Organization of Arab Petroleum Exporting Countries);
- international economic, trade and tariff models of international organizations (General Agreement on Tariffs and Trade, Organization for Economic Cooperation and Development, the United Nations Conference on Trade and Development);
- political and military unions (European Council, Organization of African Unity, the North Atlantic Treaty Organization (NATO)).

In most cases, the integration is understood as the process of amalgamation of economic entities, the deepening of relationships between them, development of their interactions and mutual cohesion. It is an instrument for the development of the economy and the markets, strengthening of competitiveness of the integration's participants.

The integration of the banking, insurance and reinsurance markets is a form of objective and conscious economic cooperation of the banking, insur-

ance and reinsurance markets with further strengthening of the developing stable relationships, which provides an opportunity of a more efficient and rational use of resources, improves the division of labor and leads to a gradual coordinated economic union with a view to mutual development, support and interaction.

During its development the process of integration of the banking, insurance and reinsurance markets evolves acquiring certain phases and forms:

- lifting of restrictions on the participants of the integration process, definition of restrictions for the third parties;
- formation of a common tariff policy on the integrating markets, establishment of tariffs to be used with the third markets;
- the emergence of an economic union as a phase of markets' integration, the emergence of a common market – a field for operations of the integration's participants;
- the emergence of a common economic policy for the integrating markets, establishment of political and economic unions.

A successful development of integration requires certain prerequisites, such as:

- integration subjects should have approximately the same level of financial and economic development;
- availability of complementary economic structures for integration subjects;
- favorable political factors influencing the markets;
- "demonstration effect" contributing to the emergence of new integrations;
- "domino effect" in which the subjects of integration have to unite in order to support their activities;
- considering integration as long-term process;
- observance of the principles of voluntariness, reciprocity and equality.

In order for the process of integration of the banking, insurance and reinsurance markets to be effective, the observance of the following preconditions is necessary:

- sufficiently developed market infrastructure that promotes cooperation;
- decentralized economic relations;
- highly developed and well-established democracy, which makes it possible to take into account the interests of all groups of the population.

In the process of integration each party pursues its main objectives, namely: acceleration of development rates, achievement of maximum operational efficiency, establishment of financial and economic stability, market expansion, obtaining the benefits of the economies of scale, cost reduction, strengthening of market participants cooperation, improvement of services, increased employment, improved standards of living, development and implementation of a common policy, exchange of experience, elimination of barriers between market participants.

The essence of integration is different at different levels, namely:

- local level (activity within one microeconomic unit);
- micro level (activity within a group of units);
- regional level (complex of integrating units in a region);
- national level (integrating sectors of certain regional complexes);
- mezoregion level (integrating sectors of certain complexes within several countries);
- macro level (integration of national complexes in a particular region of the world);
- mega level (economic interaction on the global scale).

1. Modeling and methodology

The modeling of integration of the banking, insurance and reinsurance markets involves the formalization of stages of algorithm for the calculation of the indicator's estimated value. We will present this algorithm as a sequence of transformations:

1. Formation of a data base for quantitative indicators and characteristics of the level of integration of the banking, insurance and reinsurance markets in the form of time series in the context of each indicator.
2. Normalization of the indicator of the market integration levels by using binary coefficients.
3. Calculation of numeric values and binary normalized values for market integration indicators in the context of a certain country.
4. Definition of integration levels in a certain period of time of the: banking, insurance and reinsurance markets; banking and insurance markets; insurance and reinsurance markets.
5. Identification of the general level of integration of the banking, insurance and reinsurance markets and its qualitative interpretation.

We will consider in detail the methodology for the realization of each of these stages, as well as the mathematical apparatus our calculations are based on.

At the first stage of the definition of the level of integration of the banking, insurance and reinsurance markets we must solve some problems con-

nected to the formation of indicators of its quantitative characteristics, the selection of the most important indicators, and the construction of time series in the context of each indicator.

The formation of indicators describing the level of integration of the selected markets involves the consideration of the key issues related to the description of each of them separately and identification of their relationship in the context of the following three areas: banking, insurance and reinsurance markets; banking and insurance markets; insurance and reinsurance markets. The results are presented in table form.

Table 1. List of key indicators to identify the levels of integration of banking, insurance and reinsurance markets

Indicators	Name of indicators
K_1	
...	
K_n	

In addition to Table 1, an important place during the first stage of determining the level of integration of the banking, insurance and reinsurance markets belongs to numerical values of each of the selected indicators in the form of time series (Table 2) with their further analysis on the basis of statistical characteristics (average absolute growth, growth rate, relative dynamics indicator, etc).

Table 2. Dynamics of indicators characterizing the levels of integration of banking, insurance and reinsurance markets.

Indicators	First year	...	Year *m*
K_1			
...			
K_n			

The results of the first stage are the basis for the realization (information base) of the second stage, which should convert the numerical values of the indicators of integration of banking, insurance and reinsurance markets into comparable form by implementing a two-step approach: (1) selection of intervals of possible values of indicators that characterize the range of acceptable values for the parameters of integration of banking, insurance and reinsurance markets; (2) transition to binary characteristics – normalized values of indicators in the context of a single time period. In turn, the breakdown of the indicators' values of the level of integration of banking, insurance and reinsurance markets should be based on quartiles, that is, by grouping them into four clusters. Through a series of experimental calculations and on the basis of the available statistical data it was ascertained that the normative (valid) values of the indicators of integration of banking, insurance and reinsurance markets are the values that fall in the range between the 2nd quartile (Column 2 of Table 3) and the maximum value (Column 5 of Table 3).

Table 3. Intermediate calculations of the normalized indicators of the level of integration of banking, insurance and reinsurance markets in the context of a single time period

Indicators	Minimum value	The lower boundary of the second quartile	Mean value	The upper limit of the third quartile	Maximum value
A	1	2	3	4	5
K_1					
...					
K_n					

If the numerical value of an indicator of the level of integration of banking, insurance and reinsurance markets (Column 1 of Table 4) corresponds to the indicated range of values, the corresponding binary (normalized) value (Column 2 of Table 4) possesses the value "1", otherwise "0".

The third stage in the calculation of the numerical values of integration of banking, insurance and reinsurance markets involves the accumulation of the results of the previous stage and establishment of correspondence of each of the indicators selected during the first stage to the ability of characterizing banking, insurance and reinsurance markets taken separately and their relationship in the context of certain combinations (banking and insurance markets, insurance and reinsurance markets).

The results of the second and the third stages are presented in Table 4.

Table 4. Numerical and binary indicators of the level of integration of banking, insurance and reinsurance markets

Indicators	Numerical values	Binary indicators				Total
		Normalized values of indicators	Banking market	Insurance market	Reinsurance market	
A	1	2	3	4	5	6
K_1	k_1	f_1	b_1	s_1	r_1	$b_1+ s_1+ r_1$
K_2	k_2	f_2	b_2	s_2	r_2	$b_2+ s_2+ r_2$

Table 4 (cont.). Numerical and binary indicators of the level of integration of banking, insurance and reinsurance markets

Indicators	Numerical values	Binary indicators				Total
		Normalized values of indicators	Banking market	Insurance market	Reinsurance market	
A	1	2	3	4	5	6
K_3	k_3	f_3	b_3	s_3	r_3	$b_3+ s_3+ r_3$
...	...	...	...	...	...	...
K_i	k_i	f_i	b_i	s_i	r_i	$b_i+ s_i+ r_i$
...	...	...	...	...	...	...
K_n	k_n	f_n	b_n	s_n	r_n	$b_n+ s_n+ r_n$
Total	-	-	$\sum_i b_i$	$\sum_i s_i$	$\sum_i r_i$	$\sum_i b_i + \sum_i s_i + \sum_i r_i$

Table 4 contains not only the numeric and binary indicators of the level of integration of banking, insurance and reinsurance markets, but also input data for carrying out the fourth stage. The essence of the subsequent series of transformations and calculations is to determine the components of the levels of integration for the investigated country in general and in the dynamics over time: banking, insurance and reinsurance markets, banking and insurance markets, insurance and reinsurance markets. Since the realization of this stage in the evaluation of the level of integration of banking, insurance and reinsurance markets involves the use of significant mathematical apparatus, we present it as a chain of logical transformations.

The definition of components of the general level of integration in a country is done on the basis of binary indicators (the ability of each indicator to characterize the level of integration of banking, insurance and reinsurance markets taken separately and their relationship in the context of certain combinations (banking and insurance markets, insurance and reinsurance markets), presented in Columns 3, 4, 5, 6 of Table 4, in the context of the following relationships:

banking, insurance and reinsurance markets:

$$BIR_z = \frac{\sum_i b_i \cdot \left[\sum_i b_i \,|\, (b_i + s_i + r_i) = 3\right] + \sum_i s_i \cdot \left[\sum_i s_i \,|\, (b_i + s_i + r_i) = 3\right] + \sum_i r_i \cdot \left[\sum_i r_i \,|\, (b_i + s_i + r_i) = 3\right]}{\sum_i b_i + \sum_i s_i + \sum_i r_i}, \quad (1)$$

banking and insurance markets:

$$BI_z = \frac{\sum_i b_i \cdot \left[\sum_i b_i \,|\, (b_i + s_i) = 2\right] + \sum_i s_i \cdot \left[\sum_i s_i \,|\, (b_i + s_i) = 2\right]}{\sum_i b_i + \sum_i s_i + \sum_i r_i}, \quad (2)$$

insurance and reinsurance markets:

$$IR_z = \frac{\sum_i s_i \cdot \left[\sum_i s_i \,|\, (s_i + r_i) = 2\right] + \sum_i r_i \cdot \left[\sum_i r_i \,|\, (s_i + r_i) = 2\right]}{\sum_i b_i + \sum_i s_i + \sum_i r_i}. \quad (3)$$

Further, we calculate the components of the level of integration of banking, insurance and reinsurance markets in the dynamics for a certain period of time on the basis of the data presented in Columns 2, 3, 4, 5 and 6 of Table 4, in the context of their relationships:

banking, insurance and reinsurance markets:

$$BIR_{ch} = \frac{\sum_i b_i \cdot \left[\sum_i f_i \cdot b_i \,|\, (b_i + s_i + r_i) = 3\right] + \sum_i s_i \cdot \left[\sum_i f_i \cdot s_i \,|\, (b_i + s_i + r_i) = 3\right]}{\sum_i b_i + \sum_i s_i + \sum_i r_i} + \frac{\sum_i r_i \cdot \left[\sum_i f_i \cdot r_i \,|\, (b_i + s_i + r_i) = 3\right]}{\sum_i b_i + \sum_i s_i + \sum_i r_i}, \quad (4)$$

banking and insurance markets:

$$BI_{ch} = \frac{\sum_i b_i \cdot \left[\sum_i f_i \cdot b_i \,|\, (b_i + s_i) = 2\right] + \sum_i s_i \cdot \left[\sum_i f_i \cdot s_i \,|\, (b_i + s_i) = 2\right]}{\sum_i b_i + \sum_i s_i + \sum_i r_i}, \quad (5)$$

insurance and reinsurance markets:

$$IR_{ch} = \frac{\sum_i s_i \cdot \left[\sum_i f_i \cdot s_i \,|\, (s_i + r_i) = 2 \right] + \sum_i r_i \cdot \left[\sum_i f_i \cdot r_i \,|\, (s_i + r_i) = 2 \right]}{\sum_i b_i + \sum_i s_i + \sum_i r_i}. \quad (6)$$

Input data for the calculations based on equations (4), (5), (6) in order to better demonstrate the identified patterns are presented in Table 5.

Table 5. Binary indicators for components of the level of integration of banking, insurance and reinsurance markets in the dynamics of a certain time period

Nr.	Indicators	Binary indicators (normalized values)			Total
		Banking market	Insurance market	Reinsurance market	
1					
…					
n					

Further, we identify the overall level of integration of banking, insurance and reinsurance markets presented as a fraction, the numerator of which represents the relations (4), (5), (6), and the denominator, respectively, formulas (1), (2), (3), that is, the sum of the components of the level of integration of banking, insurance and reinsurance markets for a certain period of time weighted by the sum of components of the general level of integration in a certain country:

$$RIBIR = \frac{BIR_{ch} + BI_{ch} + IR_{ch}}{BIR_z + BI_z + IR_z}. \quad (7)$$

Since the denominator of the equation (7) uses the ratios based on "standard" binary indicators (the ability of each indicator to characterize the level of integration of banking, insurance and reinsurance markets taken separately and their relationship in the context of certain combinations, which are constant within a selected set of indicators in any period of time for a given country) and the numerator uses the ratios based on the "actual" binary indicators (depending on the period of time under consideration), the numerator of this expression will not be higher than the denominator, that is, the possible values of the general level of integration of banking, insurance and reinsurance markets will be in the range from zero to one. Based on the obtained quantitative value we offer to perform the last fifth stage of determining the level of integration of banking, insurance and reinsurance markets – the identification of the general level of integration of the banking, insurance and reinsurance markets (calculated according to the formula (7)) and its qualitative interpretation. The basis for the quality assessment of the level of integration of banking, insurance and reinsurance markets is a standard approach used in statistical studies. According to it, each quantitative level of integration of banking, insurance and reinsurance markets corresponds to: the range of values from 0.3 to 0.5 – low level of quality characteristics, the range of values from 0.5 to 0.7 – the average level of assessment; the range of values from 0.7 to 1.0 – high-quality interpretation.

In the context of Ukraine, it is offered to provide a quantitative assessment of the level of integration of banking, insurance and reinsurance markets based on 11 indicators, which are presented in Table 6.

Table 6. Key indicators for the identification of the level of integration of banking, insurance and reinsurance markets in Ukraine

Indicators	Name of indicators
K_1	GDP
K_2	Reinsurance of credit risks, thousand US dollars
K_3	Reinsurance of financial risks, thousand US dollars
K_4	Premiums paid to reinsurers
K_5	Payments compensated by reinsurers, thousand US dollars
K_6	Insurance of credit risks, thousand US dollars
K_7	Insurance of financial risks, thousand US dollars
K_8	Insurance payments, thousand US dollars
K_9	Bank assets, thousand US dollars
K_{10}	Assets of insurance companies, thousand US dollars
K_{11}	The volume of investment deposits of insurance companies, thousand US dollars

In order to get a comprehensive characteristic of the banking, insurance and reinsurance markets in the Russian Federation it is offered to carry out a detailed analysis of the list of 15 indicators (Table 7).

Table 7. Key indicators for the identification of the level of integration of banking, insurance and reinsurance markets in the Russian Federation

Indicators	Name of indicators
K_1	GDP
K_2	Gross insurance premiums (with exception of compulsory medical insurance)
K_3	Insurance of business and financial risks
K_4	Gross insurance payments (with exception of compulsory medical insurance)
K_5	Insurance of business and financial risks
K_6	Insurance premiums on reinsurance agreements (with exception of compulsory medical insurance)
K_7	Insurance of business and financial risks
K_8	Information about the payments on reinsurance agreements (with exception of compulsory medical insurance)
K_9	Insurance of business and financial risks
K_{10}	Information about the premiums on reinsurance agreements
K_{11}	Insurance of business and financial risks
K_{12}	Information about the share of reinsurers in the payments on agreements ceded to reinsurers

Table 7 (cont.). Key indicators for the identification of the level of integration of banking, insurance and reinsurance markets in the Russian Federation

Indicators	Name of indicators
K_{13}	Assets of insurance companies, billion dollars
K_{14}	Including deposits, billion dollars
K_{15}	Bank assets, billion dollars

A comprehensive characterization of the market integration is possible due to the static numerical values for a given year and the dynamics of their changes over time, making it possible to provide background statistical information in the form of time series shown in Table 8 in the context of data for Ukraine and in Table 9 in the context of statistical information for the Russian Federation.

Table 8. The dynamics of changes in the indicators of the level of integration of banking, insurance and reinsurance markets in Ukraine

Indicators	2006	2007	2008	2009	2010	2011 – 9 months	2011
K_1	108	143	180	117	138	165	220
K_2	35122	42870	97436	122281	30708	13926	18568
K_3	391337	434197	448883	208490	281352	90942	121256
K_4	1113192	1272071	1720040	1141001	1353300	588922	785230
K_5	78475	129644	175806	124223	64055	40940	54586
K_6	101750	161388	321085	217823	63005	44955	59940
K_7	682455	752155	703126	319436	364519	251175	334900
K_8	514772	834238	1337894	864852	768841	495426	660568
K_9	67362235	118692297	175727988	112124464	118650377	128967734	171956979
K_{10}	4751406	6378812	7956452	5387689	5697053	0	0
K_{11}	1079947	541683	850835	760770	814181	808759	1078346

Table 9. The dynamics of changes in the indicators of the level of integration of banking, insurance and reinsurance markets in the Russian Federation

Indicators	2006	2007	2008	2009	2010	2011
K_1	989.93	1299.71	1660.85	1221.99	1479.82	1849.91
K_2	14999735.56	19024000.39	22316079.29	16167738.28	18368445.49	22627554.81
K_3	237101.83	300713.65	352751.77	241519.39	262252.73	411945.90
K_4	5975099.56	7974969.24	10045715.04	8980582.50	9707177.98	10335718.00
K_5	39836.32	53169.56	66975.34	62211.46	79589.14	50384.96
K_6	2983108.33	2487545.52	2154903.66	1353605.48	1148571.86	1185359.03
K_7	36988.19	30843.60	26719.10	19119.14	12258.56	14698.64
K_8	649622.96	657070.57	675637.96	467582.66	396105.43	467936.78
K_9	26184.73	26484.93	27233.33	20487.82	7104.54	27687.96
K_{10}	4716285.92	4109589.04	3256936.07	3077953.86	2881561.26	3337064.48
K_{11}	145875.44	127110.22	100737.53	71087.03	91425.97	126698.26
K_{12}	754605.75	904109.59	716525.93	707520.33	821797.76	976159.58
K_{13}	24.87	29.29	34.04	27.50	31.58	37.51
K_{14}	4.27	4.94	5.98	4.94	5.01	5.46
K_{15}	517.52	792.21	1126.75	926.35	1112.73	1416.38

By modeling the level of integration of banking, insurance and reinsurance markets and forming the information basis for subsequent calculations we can begin to normalize the characteristics of the level of integration of the investigated markets by using binary coefficients. We will perform the calculation of numerical values of the lower and upper limits of the range of indicators' values with the results presented in Table 10.

Table 10. Intermediate calculations for normalization of indicators of the level of integration of banking, insurance and reinsurance markets in Ukraine in the period from 2006 to 2011

Indicators	Minimum value	The lower boundary of the second quartile	Mean value	The upper limit of the third quartile	Maximum value
K_1	107,75	122,44	137,12	158,56	179,99
K_2	30708,34	48195,85	65683,35	93982,29	122281,22
K_3	208489,99	280670,83	352851,67	400867,31	448882,95
K_4	1113192,29	1216556,50	1319920,71	1519980,11	1720039,51
K_5	64055,42	89248,11	114440,81	145123,63	175806,45
K_6	63005,11	118007,72	173010,33	247047,68	321085,04
K_7	319435,94	441887,08	564338,21	658246,71	752155,22
K_8	514772,28	689445,87	864119,46	1101006,60	1337893,74

Table 10 (cont.). Intermediate calculations for normalization of indicators of the level of integration of banking, insurance and reinsurance markets in Ukraine in the period from 2006 to 2011

Indicators	Minimum value	The lower boundary of the second quartile	Mean value	The upper limit of the third quartile	Maximum value
K_9	67362235,45	92936853,93	118511472,42	147119730,33	175727988,24
K_{10}	4751405,94	5392844,14	6034282,34	6995366,97	7956451,61
K_{11}	541683,17	675583,20	809483,24	944714,89	1079946,53

For both Ukraine and Russian Federation (Table 11), the range of values for the indicators of the level of integration of banking, insurance and reinsurance markets is a set of values between the lower boundary of the second quartile and the maximum value for this time period.

Table 11. Intermediate calculations for normalization of indicators of the level of integration of banking, insurance and reinsurance markets in Russia in the period from 2006 to 2011

Indicators	Minimum value	The lower boundary of the second quartile	Mean value	The upper limit of the third quartile	Maximum value
K_1	989.93	1203.48	1417.03	1633.47	1849.91
K_2	14999735.56	16958497.26	18917258.97	20772406.89	22627554.81
K_3	237101.83	269074.69	301047.54	356496.72	411945.90
K_4	5975099.56	7405821.64	8836543.72	9586130.86	10335718.00
K_5	39836.32	49265.39	58694.46	69141.80	79589.14
K_6	1148571.86	1517043.75	1885515.65	2434311.99	2983108.33
K_7	12258.56	17848.21	23437.87	30213.03	36988.19
K_8	396105.43	474215.74	552326.06	613982.01	675637.96
K_9	7104.54	14817.55	22530.55	25109.25	27687.96
K_{10}	2881561.26	3222396.51	3563231.77	4139758.85	4716285.92
K_{11}	71087.03	90788.05	110489.08	128182.26	145875.44
K_{12}	707520.33	760486.75	813453.16	894806.37	976159.58
K_{13}	24.87	27.84	30.80	34.15	37.51
K_{14}	4.27	4.69	5.10	5.54	5.98
K_{15}	517.52	749.76	981.99	1199.19	1416.38

Further, we form a set of "standard" binary values (the ability of each indicator to characterize the level of integration of banking, insurance and reinsurance markets taken separately and their combinations) based on the actual values for the year 2010 in Columns 1 trough 5 of Table 12 for the Ukrainian markets and Table 13 for the Russian markets.

Table 12. Numerical and binary indicators of the level of integration of banking, insurance and reinsurance markets in Ukraine

Indicators	Numerical values (2010)	Binary characteristics				Total
		Normalized values	Banking market	Insurance market	Reinsurance market	
A	1	2	3	4	5	6
K_1	138	1	1	1	1	3
K_2	30708	0	1	1	1	3
K_3	281352	1	1	1	1	3
K_4	1353300	1	0	0	1	1
K_5	64055	0	0	0	1	1
K_6	63005	0	1	1	0	2
K_7	364519	0	1	1	0	2
K_8	768841	1	0	1	0	1
K_9	118650377	1	1	0	0	1
K_{10}	5697053	1	0	1	0	1
K_{11}	814181	1	1	1	0	2
Total	-	-	7	8	5	20
Unit weight	-	-	0,35	0,4	0,25	1

Table 13. Numerical and binary indicators of the level of integration of banking, insurance and reinsurance markets in the Russian Federation

Indicators	Numerical values (2010)	Binary characteristics				Total
		Normalized values	Banking market	Insurance market	Reinsurance market	
A	1	2	3	4	5	6
K_1	1,479.82	1	1	1	1	3
K_2	18,368,445.49	1	1	1	0	2
K_3	262,252.73	0	1	1	0	2
K_4	9,707,177.98	1	1	1	0	2
K_5	79,589.14	1	1	1	0	2
K_6	1,148,571.86	0	1	1	1	3
K_7	12,258.56	0	1	1	1	3
K_8	396,105.43	0	1	0	1	2
K_9	7,104.54	0	1	0	1	2
K_{10}	2,881,561.26	0	1	1	0	2
K_{11}	91,425.97	1	1	1	0	2
K_{12}	821,797.76	1	0	0	1	1
K_{13}	31.58	1	0	1	0	1
K_{14}	5.01	1	1	1	0	2
K_{15}	1,112.73	1	1	0	0	1
Total	-	-	13	11	6	30
Unit weight	-	-	0.43	0.37	0.20	-

Further, we identify the components of the levels of integration for each country, presenting "actual" binary values (correspondence of numerical data for 2010 to regulations) for both countries in Tables 14 and 15.

Table 14. Binary indicators for the identification of the level of integration of banking, insurance and reinsurance markets in Ukraine

N	Indicators	Binary indicators (normalized values)			Total
1	GDP	1	1	1	3
2	Reinsurance of credit risks, thousand US dollars	0	0	0	0
3	Reinsurance of financial risks, thousand US dollars	1	1	1	3
4	Premiums paid to reinsurers	0	0	1	1
5	Payments compensated by reinsurers, thousand US dollars	0	0	0	0
6	Insurance of credit risks, thousand US dollars	0	0	0	0
7	Insurance of financial risks, thousand US dollars	0	0	0	0
8	Insurance payments, thousand US dollars	0	1	0	1
9	Bank assets, thousand US dollars	1	0	0	1
10	Assets of insurance companies, thousand US dollars	0	1	0	1
11	The volume of investment deposits of insurance companies, thousand US dollars	1	1	0	2
	Total	4	5	3	12
		0,33	0,42	0,25	

Table 15. Binary indicators for the identification of the level of integration of banking, insurance and reinsurance markets in Russia

N	Indicators	Binary indicators (normalized values)			Total
1	GDP	1	1	1	3
2	Gross insurance premiums (with exception of compulsory medical insurance)	1	1	0	2
3	Insurance of business and financial risks	0	0	0	0
4	Gross insurance payments (with exception of compulsory medical insurance)	1	1	0	2
5	Insurance of business and financial risks	1	1	0	2
6	Insurance premiums on reinsurance agreements (with exception of compulsory medical insurance)	0	0	0	0
7	Insurance of business and financial risks	0	0	0	0
8	Information about the payments on reinsurance agreements (with exception of compulsory medical insurance)	0	0	0	0
9	Insurance of business and financial risks	0	0	0	0
10	Information about the premiums on reinsurance agreements	0	0	0	0
11	Insurance of business and financial risks	1	1	0	2

Table 15 (cont.). Binary indicators for the identification of the level of integration of banking, insurance and reinsurance markets in the Russian Federation

N	Indicators	Binary indicators (normalized values)			Total
12	Information about the share of reinsurers in the payments on agreements ceded to reinsurers	0	0	1	1
13	Assets of insurance companies, billion dollars	0	1	0	1
14	Including deposits, billion dollars	1	1	0	2
15	Bank assets, billion dollars	1	0	0	1
	Total	7	7	2	16
		0.44	0.44	0.13	

For a more detailed analysis of components of the level of integration of banking, insurance and reinsurance markets we will separately study the numerators and denominators of equations (1)-(6) presented in Tables 16 and 17 for Ukraine and the Russian Federation, respectively.

Table 16. Components of the level of integration of banking, insurance and reinsurance markets, estimated value of design parameters for Ukraine

Indicator	Numerator	Denominator	Result
BIR	2	3	-
BI, IR	0.75	2.25	-
-	2.75	5.25	0.52381

Table 17. Components of the level of integration of banking, insurance and reinsurance markets, estimated value of design parameters for Russian Federation

Indicator	Numerator	Denominator	Result
BIR	1	3	-
BI, IR	4.38	6.16	-
-	5.38	9.16	0.58663

Conclusion

On the basis of the data in Tables 16 and 17, we can make the following conclusions about the general level of integration of banking, insurance and reinsurance markets:

- the calculated value of the general level of integration of banking, insurance and reinsurance markets for Ukraine is 0.52381, which indicates the average level of market integration;
- the calculated value of the general level of integration of banking, insurance and reinsurance markets for Russian Federation is 0.58663, which also indicates the average level of market integration, although the value of this indicator is higher than for Ukrainian markets.

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