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COGNITIVE ANALYSIS IN THE SYSTEM OF DEVELOPMENT OF FACTOR MODEL OF TAX MANAGEMENT

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The increasing importance of a risk-oriented approach in the system of tax management involves strengthening the role of persons responsible for decision-making about managing risks concerning main indicators that influence financial and operational activities of an organization.

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The availability of a great number of methods for risk management is often subjective and based on opinions of organization's managerial staff regarding the importance of factors and their degree of influence on key performance indicators. This approach often leads to obtaining subjective information, which in a situation of tax planning often leads to risks concerning minimization of net profit that remains in an organization after paying taxes and fees.

To reduce these risks the article suggests a method to carry out cognitive analysis with subsequent development of a factor model of tax management.

The offered method will allow making the correct managerial decision based on analysis of a group of factors that influence the tax base and the main indicators of organization's activities. In particular, the suggested method of developing a model of internal factors of tax management with the application of elements of cognitive analysis allows managers to determine effective scenarios of optimizing the tax management system as well as advantages and disadvantages of the system of tax management of an organization.

Keywords: tax management, factor model, cognitive analysis, scenario approach, key performance indicators.

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G = <V, E>   (1)

  = <G, X, F, O>   (2)

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:
1. $V = \{v_i\}$, $i = 1,2, \ldots, k$ — .
;
2. $E = \{e_{ij}\}$ — , ;
3. $X = \{x_i\}$ — ;
4. $F = f\{v_i, v_j, e_{ij}\}$ — ;
5. — .

$$A_G = \begin{array}{c|cccccc} & V_1 & V_2 & \ldots & V_j & \ldots & V_m \\ \hline V_1 & 0 & 1 & \ldots & b_0 + b_j x_j & \ldots & 1 \\ V_2 & -1 & 0 & \ldots & 1 & \ldots & 1 \\ \ldots & \ldots & \ldots & \ldots & \ldots & \ldots & \ldots \\ V_i & 0 & f(v_i, v_j, e_{ij}) & \ldots & ax^j & \ldots & 1 \\ \ldots & \ldots & \ldots & \ldots & \ldots & \ldots & \ldots \\ V_m & -1 & f_y & \ldots & 1 & \ldots & 0 \end{array}$$

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f_{ij} — ; $P_j(n)$ —
i; $Q_i(n)$ — , i n.

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:
$$x_i(n+1) = x_i(n) + \sum_{j=1}^{k-1} f_{ij} P_j(n) + Q_i(n), \quad (3)$$

$_i(n)$ — ( ) (n);
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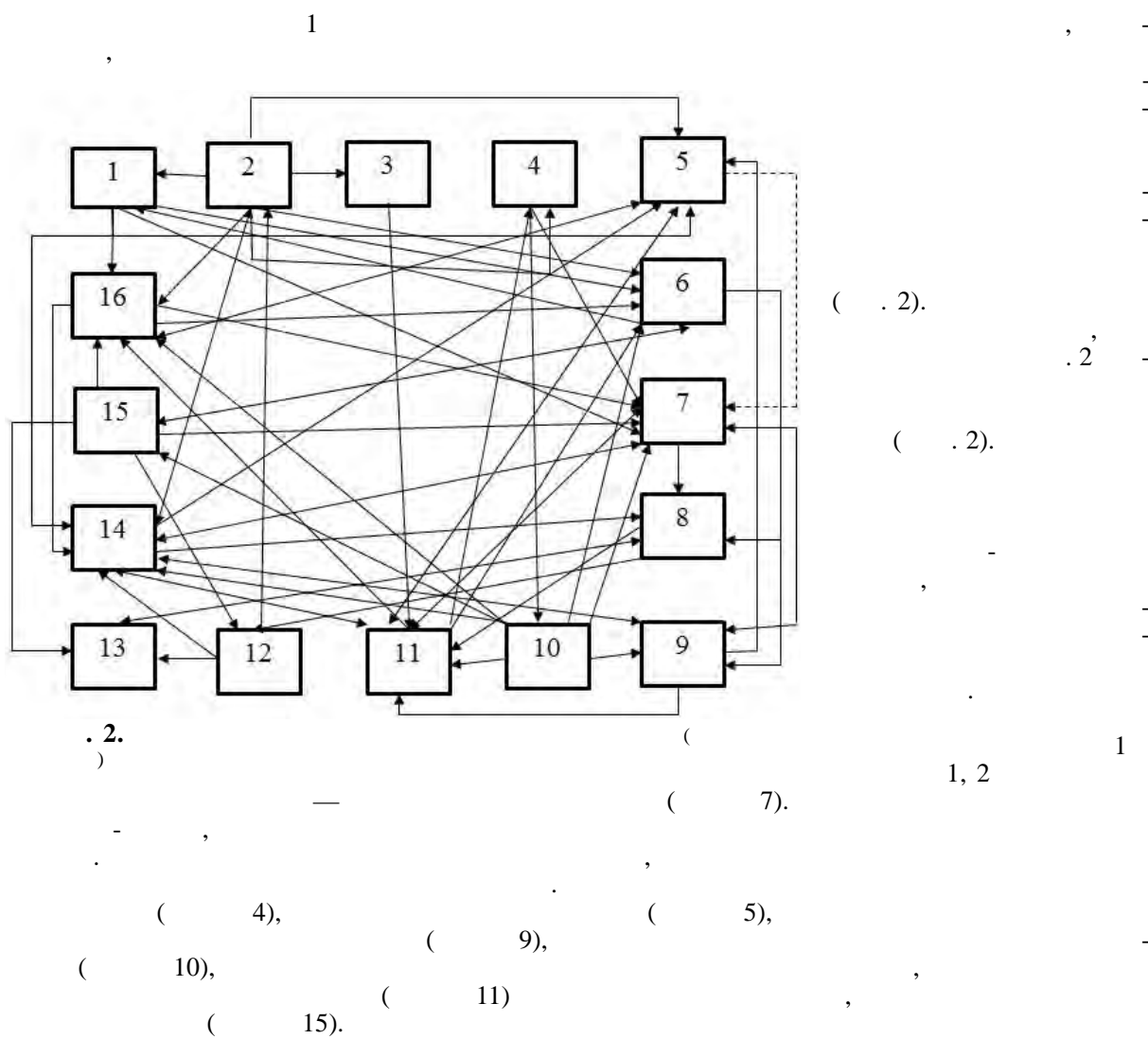
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-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	1
2	1	0	1	1	1	1	0	0	0	0	0	0	0	1	0	1
3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
4	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
5	0	0	0	0	0	0	-1	0	0	0	1	0	0	0	0	1
6	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0
7	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0
8	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0
9	0	0	0	0	1	0	1	0	0	0	1	0	0	1	0	0
10	0	0	0	0	0	1	1	0	1	0	1	0	0	1	1	1
11	0	0	0	1	1	1	1	0	0	0	0	0	0	1	0	1
12	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0
13	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
14	0	1	0	0	1	0	1	1	1	0	1	0	0	0	0	0
15	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	1
16	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0

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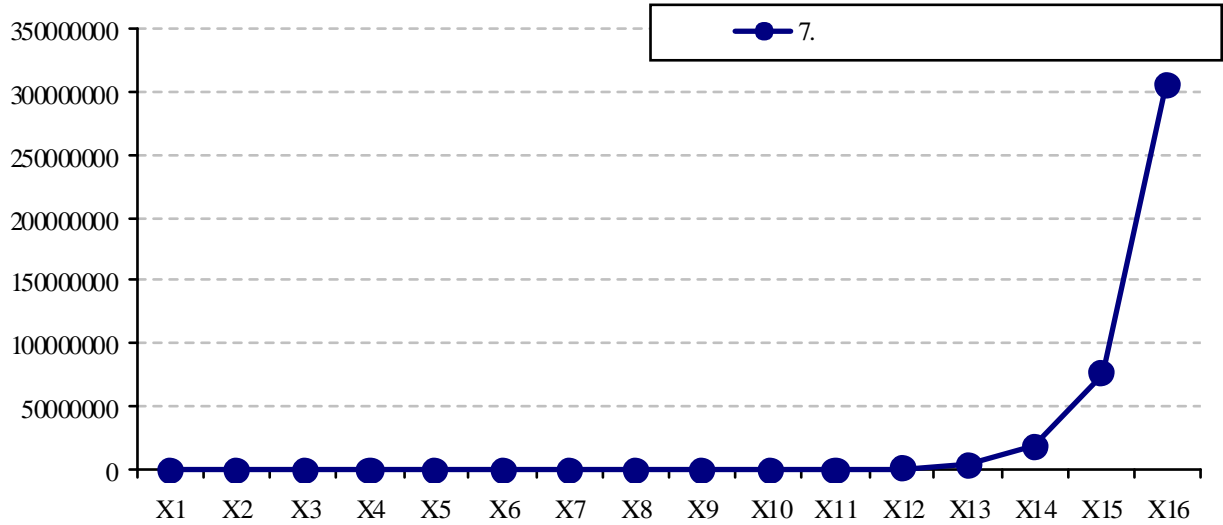
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2	2	2	7	22	10	15	14	12	0	28	16	10	19	19	10	228
7	7	7	35	92	53	62	54	44	7	84	64	80	87	87	60	943
28	28	28	112	364	197	243	227	209	35	353	287	351	309	309	232	3662
103	105	105	456	1427	807	970	829	784	112	1415	1061	1348	1263	1263	919	14474
373	375	375	1788	5688	3178	3881	3391	3152	456	5488	4310	5371	4987	4987	3634	57738
1550	1550	1550	7038	22390	12448	15137	13394	12502	1788	21928	17028	21338	19623	19623	14236	226212
6048	6048	6048	27976	88573	49472	50147	52579	48996	7038	86384	66815	83843	77737	77737	56460	894110
23933	23933	23933	110317	349858	194977	237180	208644	194344	27976	341118	265104	331919	306912	306912	222953	3532870
94765	94765	94765	435883	1382261	770464	937414	822912	767045	110317	1348847	1045865	1310969	1212345	1212345	880781	13956196
373727	373727	373727	1722574	5461301	3044719	3704002	3252140	3030538	435883	5327057	4132921	5178786	479329	479329	3480602	55144424
1477447	1477447	1477447	6804504	21577687	12027765	14633458	12852140	11975933	1722574	21048920	16331621	20464542	18927389	18927389	13750339	2,18E+08
5837194	5837194	5837194	26886114	85250844	47522933	57815878	47522933	47311186	6804504	83165507	64517737	80849358	74784643	74784643	54327437	
23060310	23060310	23060310	1,06E+08	3,37E+08	1,88E+08	2,28E+08	1,88E+08	1,87E+08	26886114	3,29E+08	2,95E+08					
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Фак-тор	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16
1	0	0	0	2	9	37	140	513	2063	8111	32044	126809	500536	1977983	7815177	30875487
2	0	0	2	9	37	140	513	2063	8111	32044	126809	500536	1977983	7815177	30875487	121991751
3	0	0	0	2	9	37	140	513	2063	8111	32044	126809	500536	1977983	7815177	30875487
4	-1	0	0	7	42	154	610	2398	9436	37412	147729	583612	2306186	9110690	35996804	142222621
5	0	-1	4	26	118	482	1909	7597	29987	118560	468418	1850679	7311980	28889667	114140511	450966708
6	0	2	4	14	67	264	1071	4249	16697	66119	261096	1031560	4076279	16104044	63626977	251389255
7	0	3	7	22	84	327	1297	5178	20315	80462	317642	1255056	4959058	19592516	77408394	305841461
8	0	0	7	21	75	302	1131	4522	17916	70495	279139	1102051	4354191	17205210	67972608	268560604
9	1	1	7	19	63	272	1056	4208	16710	65706	260050	1027095	4057633	16033566	63344752	250272710
10	1	1	1	1	8	43	155	611	2399	9437	37413	147730	583513	2306187	9110691	35996805
11	0	0	5	33	117	470	1885	7373	29301	115685	455803	1805650	7132707	28181627	111347134	439918781
12	0	1	2	11	27	91	378	1439	5749	22777	89592	354696	1400561	5533482	21865103	86382840
13	0	1	3	13	38	118	469	1817	7188	28526	112369	444288	1755257	6934043	27398585	108247943
14	1	1	7	26	113	422	1685	6672	26295	104032	410944	1623287	6414616	25342005	100126648	395597272
15	1	2	4	6	16	76	308	1227	4861	19097	75557	298510	1179291	4659893	18410232	72737669
16	0	1	2	16	77	305	1248	4910	19384	76722	302934	1197044	4729914	18686110	73830534	291699232

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Фактор	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Вектор впливу	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0

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Table (2*) — middle matrix, columns 1–16:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	0	1	2	1	0	0	0	1	0	0	0	0	0	1	1
3	1	2	3	2	4	3	5	1	1	5	0	0	0	4	2
19	6	11	16	11	9	16	10	0	6	20	6	6	6	17	12
75	24	40	50	40	50	50	44	6	24	72	18	12	61	69	47
299	95	163	202	163	177	202	165	24	95	293	73	61	223	258	191
1179	379	663	801	663	696	801	647	95	379	1148	284	223	883	1045	771
4674	1467	2601	3174	2601	2793	3174	2604	379	1467	4544	1106	883	3551	4085	3009
18430	5812	10277	12491	10277	10966	12491	10239	1467	5812	18028	4434	3551	13946	16180	11942
72902	22996	40653	49486	40653	43382	49486	40415	5812	22996	71041	17497	13946	55126	63954	47141
287903	90772	160437	195169	160437	171590	195169	159905	22996	90772	280519	69072	55126	218055	252540	186198
1137630	358819	634209	771623	634209	677218	771623	631142	90772	358819	1109334	273181	218055	860651	997944	735914
4494609	1417500	2505519	3048128	2505519	2676957	3048128	2494548	358819	1417500	4384229	1078706	860651	3401938	3942906	2907235
17758102	5600228	9898929	12043275	9898929	10575259	12043275	9855372	1417500	5600228	17323633	4262589	3401938	13439597	15577275	11486303
70161068	22127190	39111330	47582546	39111330	41782063	47582546	38936979	5600228	22127190	68442782	16841535	13439597	61547577	1,79E+08	45383129
2,77E+08	87421995	1,55E+08	1,88E+08	1,55E+08	1,65E+08	1,88E+08	1,54E+08	22127190	2,7E+08	5098497	66538094	5309 8497	2,43E+08	4711558	1,79E+08

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0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	0	1	1	0	1	1	1	0	0	0	0	0	1	2
1	4	1	6	6	1	4	4	0	1	4	6	6	6	4	12
4	23	4	24	24	16	23	23	6	4	23	24	24	18	23	47
23	81	23	95	95	50	81	81	24	23	81	95	61	73	81	191
81	319	81	379	379	177	319	319	95	81	319	379	223	284	319	771
319	1268	319	1467	1467	696	1268	1268	379	319	1268	1467	883	1106	1268	3009
1268	4968	1268	5812	5812	2793	4968	4968	1467	1268	4968	5812	3551	4434	4968	11942
4968	19731	4968	22996	22996	10966	19731	19731	5812	4968	19731	22996	13946	17497	19731	47141
19731	77900	19731	90772	90772	43382	77900	77900	22996	19731	77900	90772	55126	69072	77900	186198
77900	307666	77900	358819	358819	171590	307666	307666	90772	77900	307666	358819	218055	273181	307666	735914
307666	1215999	307666	1417500	1417500	677218	1215999	1215999	358819	307666	1215999	1417500	860651	1078706	1215999	2907235
1215999	4803557	1215999	5600228	5600228	2676957	4803557	4803557	1417500	1215999	4803557	5600228	3401938	4262589	4803557	11486303
4803557	18979213	4803557	22127190	22127190	10575259	18979213	18979213	5600228	4803557	18979213	22127190	13439597	16841535	18979213	45383129
18979213	74987174	18979213	87421995	87421995	41782063	18979213	18979213	22127190	18979213	74987174	87421995	5309 8497	66538094	18979213	1,79E+08

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Фак-тор	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16
1	0	0	0	1	5	28	109	428	1696	6664	26395	104295	411961	1627960	6431517	25410730
2	0	0	1	5	28	109	428	1696	6664	26395	104295	411961	1627960	6431517	25410730	100397904
3	0	0	0	1	5	28	109	428	1696	6664	26395	104295	411961	1627960	6431517	25410730
4	1	2	2	8	32	127	506	1973	7785	30781	121553	480372	1897872	7498100	29625290	117047285
5	0	1	4	23	98	397	1576	6250	24680	97582	385485	1523115	6017724	23775826	93936894	371141461
6	0	1	3	14	54	217	880	3481	13758	54411	214848	849057	3354576	13253505	52364835	206890173
7	0	2	5	21	71	273	1074	4248	16739	66225	261394	1033017	4081145	16124420	63706966	251703769
8	0	0	4	13	63	240	936	3729	14695	58077	229667	906885	3583842	14159101	55941169	221024157
9	0	0	5	15	59	224	871	3475	13714	54129	214034	845176	3339724	13195096	52132075	205973756
10	0	1	2	2	8	32	127	506	1973	7785	30781	121553	480372	1897872	7498100	29625290
11	1	1	6	26	98	396	1544	6088	24116	95157	376075	1485910	5870139	23193772	91636554	362050577
12	0	0	0	6	18	79	302	1185	4736	18682	73808	291863	1152514	4554452	17994049	71092546
13	0	0	0	6	24	97	381	1487	5921	23418	92490	365671	1444377	5706966	22548501	89086595
14	0	0	5	22	91	349	1394	5479	21659	85613	338153	1336097	5279003	20856278	82403855	325571886
15	0	0	2	5	16	62	249	1007	3987	15731	62196	245629	970610	3834948	15151377	59862935
16	0	1	3	15	62	253	1024	4033	15975	63116	249314	985228	3892463	15378766	60761895	240065172

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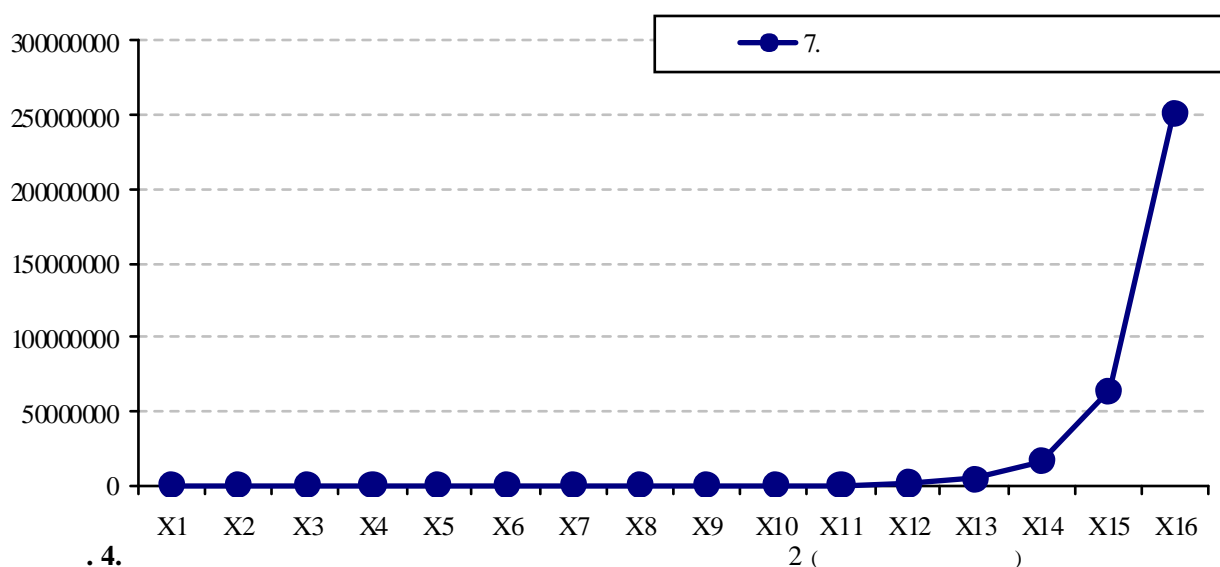
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