Analysis of Natural Movement of Romanian Population During 2007-2014 - II

Cătălin Angelo Ioan[1]

Abstract: Article shall carry out the analysis of natural movement of Romanian population During 2007-2014. They are thus treated indicators: Live births, Deceased, Natural increase, Marriages, Divorces and Deaths under 1 year. In addition to the regression analysis, are determined the median, quartiles, the arithmetic mean and standard deviation for each indicator. Also the analysis examines dependence aforementioned indicators of regional GDP variation.

Keywords: Live births; Deceased; Natural increase; Marriages; Divorces

JEL Classification: Q56

1. Introduction

In what follows we shall carry out the analysis of natural movement of Romanian population During 2007-2014. They are thus treated indicators: Live births, Deceased, Natural increase, Marriages, Divorces and Deaths under 1 year. In addition to the regression analysis, are determined the median, quartiles, the arithmetic mean and standard deviation for each indicator. Also the analysis examines dependence aforementioned indicators of regional GDP variation. In this second part, we shall analize the following counties: Calarasi, Caras-Severin, Cluj, Constanta, Covasna, Dambovita, Dolj, Galati, Giurgiu, Gorj and Harghita.

2. Analysis of Natural Movement of Romanian Population During 2007-2014

2.12. Analysis of Natural Movement of Calarasi County Population

Statistics of natural movement corresponding to Calarasi County are the following:

[1] Associate Professor, PhD, Department of Economics, Danubius University of Galati, Romania, Address: 3 Galati Blvd., Galati 800654, Romania, Tel.: +40372361102, Corresponding author: catalin_angelo_ioan@univ-danubius.ro.

Table 67. The natural movement of Calarasi County population during 2007-2008

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,07	287	363	-76	247	52	6	ian,08	299	459	-160	60	27	5
feb,07	236	326	-90	403	71	1	feb,08	270	403	-133	111	59	4
mar,07	274	386	-112	264	63	2	mar,08	282	371	-89	92	56	3
apr,07	286	344	-58	267	43	3	apr,08	253	369	-116	66	48	3
mai,07	251	373	-122	195	67	6	mai,08	272	347	-75	172	47	4
iun,07	267	338	-71	292	56	2	iun,08	325	332	-7	234	75	4
iul,07	353	381	-28	249	70	3	iul,08	346	324	22	235	29	5
aug,07	295	296	-1	244	84	6	aug,08	299	309	-10	295	101	4
sept,07	322	334	-12	332	105	6	sept,08	329	305	24	253	66	2
oct,07	309	320	-11	333	82	4	oct,08	349	334	15	272	59	6
nov,07	268	397	-129	200	84	0	nov,08	248	368	-120	176	41	4
dec,07	284	415	-131	91	74	7	dec,08	275	411	-136	59	57	3

Source: INSSE

Table 68. The natural movement of Calarasi County population during 2009-2010

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,09	300	429	-129	59	23	10	ian,10	269	419	-150	61	14	5
feb,09	270	323	-53	100	42	6	feb,10	260	405	-145	52	48	7
mar,09	298	413	-115	61	75	6	mar,10	282	399	-117	40	63	8
apr,09	260	372	-112	65	38	1	apr,10	243	385	-142	100	37	2
mai,09	264	363	-99	132	50	4	mai,10	223	333	-110	124	43	1
iun,09	283	328	-45	173	51	5	iun,10	308	369	-61	91	50	4
iul,09	339	349	-10	215	32	1	iul,10	316	326	-10	214	48	2
aug,09	356	331	25	244	70	3	aug,10	326	372	-46	192	56	2
sept,09	330	334	-4	221	51	4	sept,10	312	315	-3	179	38	6
oct,09	367	382	-15	269	31	3	oct,10	263	354	-91	169	36	7
nov,09	285	345	-60	119	37	2	nov,10	257	363	-106	78	68	2
dec,09	266	416	-150	56	53	6	dec,10	235	396	-161	41	61	6

Source: INSSE

Table 69. The natural movement of Calarasi County population during 2011-2012

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,11	228	444	-216	39	19	2	ian,12	263	393	-130	30	16	3
feb,11	201	366	-165	51	45	5	feb,12	236	432	-196	34	40	6
mar,11	216	437	-221	40	49	6	mar,12	221	444	-223	22	44	3
apr,11	187	347	-160	46	56	2	apr,12	212	379	-167	74	34	4
mai,11	198	373	-175	91	51	1	mai,12	244	374	-130	104	26	5
iun,11	264	333	-69	142	56	3	iun,12	258	317	-59	132	24	4
iul,11	296	304	-8	145	37	0	iul,12	307	344	-37	153	71	1
aug,11	319	294	25	171	57	5	aug,12	307	343	-36	183	41	2
sept,11	302	302	0	177	48	5	sept,12	274	254	20	211	39	4
oct,11	286	367	-81	155	43	1	oct,12	281	320	-39	157	52	4
nov,11	243	355	-112	67	69	1	nov,12	221	358	-137	103	37	2
dec,11	245	391	-146	49	34	2	dec,12	202	381	-179	36	58	3

Source: INSSE

Table 70. The natural movement of Calarasi County population during 2013-2014

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,13	223	412	-189	44	24	1	ian,14	253	399	-146	38	15	3
feb,13	194	350	-156	37	37	2	feb,14	195	383	-188	49	22	3
mar,13	201	349	-148	63	32	1	mar,14	203	429	-226	35	28	3
apr,13	207	389	-182	27	43	1	apr,14	186	369	-183	56	30	5
mai,13	189	320	-131	76	36	3	mai,14	197	363	-166	126	40	4
iun,13	218	318	-100	159	24	4	iun,14	221	322	-101	123	23	3
iul,13	311	370	-59	138	22	3	iul,14	303	346	-43	153	35	4
aug,13	288	328	-40	198	16	12	aug,14	295	329	-34	229	21	3
sept,13	298	306	-8	187	35	1	sept,14	280	321	-41	182	32	2
oct,13	229	374	-145	164	28	5	oct,14	241	335	-94	135	41	9
nov,13	222	338	-116	82	64	1	nov,14	190	348	-158	79	52	1
dec,13	187	450	-263	42	41	3	dec,14	193	422	-229	46	60	3

Source: INSSE

Table 71. The population trends of Calarasi County during 2007-2014

Year	Population	Year	Population
2007	330242	2011	326475
2008	329329	2012	324825
2009	328779	2013	323409
2010	327904	2014	321429

Source: INSSE

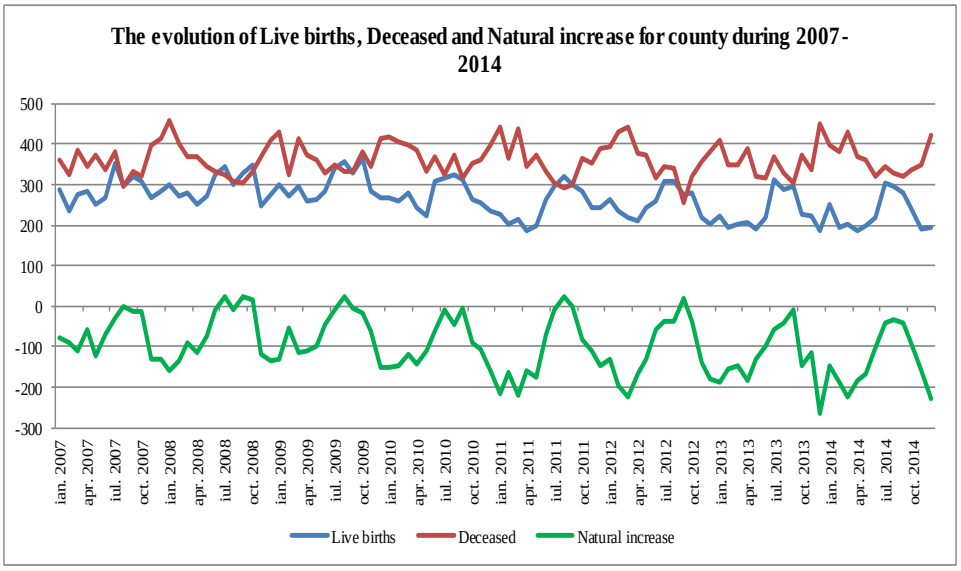


Figure 122

From figure 122 we can see a sinusoidal evolution of the indicator. Except months iul 2008, sept 2008, oct 2008, aug 2009, aug 2011, sept 2011, sept 2012 the natural increase was negative.

Regression analysis relative to indicator "Live births" gives us an equation: y=-0.831443299x+305.1791667 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Deceased" gives us an equation: y=-0.031158437x+363.4695175 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

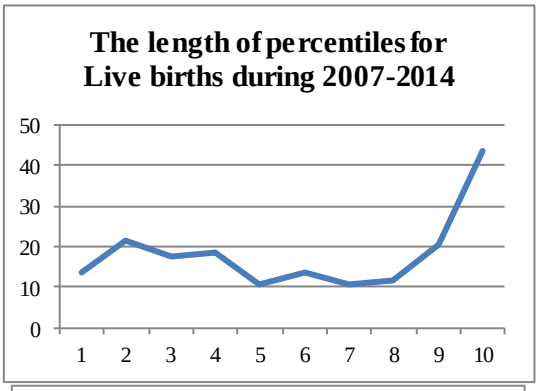
Regression analysis relative to indicator "Natural increase" gives us an equation: y=-0.800284862x+-58.29035088 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

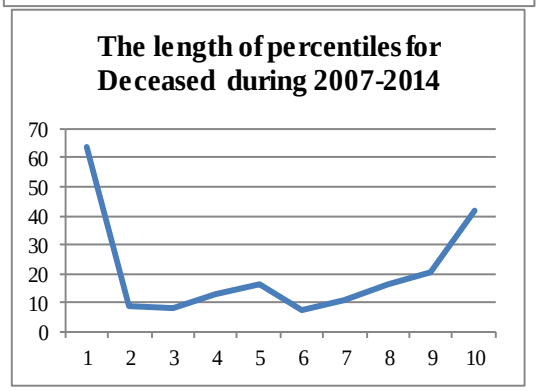
For the set of values above, the median indicator for "Live births" is 268, for "Deceased" is 363 and for "Natural increase": -108. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births": (186,226.75,267.5,298.25,367), for "Deceased": (254,331.75,363,386.75,459) and for "Natural increase": (-263,-146.5,-108,-39.75,25).

The arithmetic mean and the standard deviation for "Live births" are: (265, 45.4), for "Deceased": (362,40.38) and for "Natural increase": (-97,69.48). This means that with a probability greather than 0.68 "Live births" are in the range [220,310], for "Deceased" in [322,402] and for "Natural increase" in [-166,-28].

Percentiles length indicators analysis (Figure 123) show that, indeed the concentration is around the middle of the data.





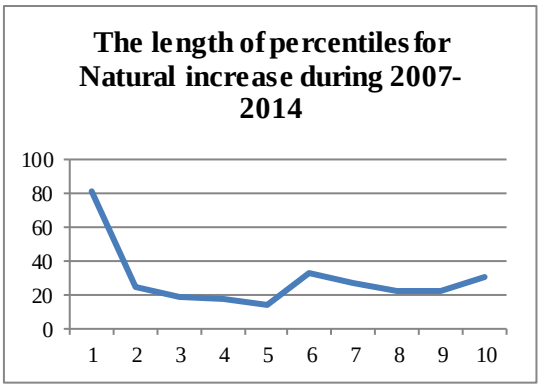


Figure 123

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Live births/10000 inh., Deceased/10000 inh. and Natural increase/10000 inh. as in the figure 124.

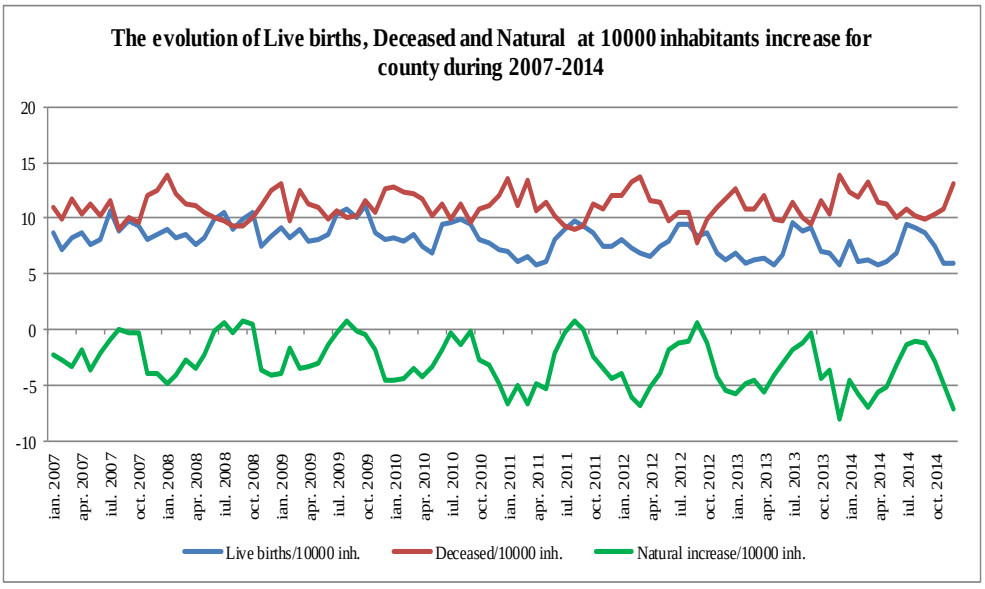


Figure 124

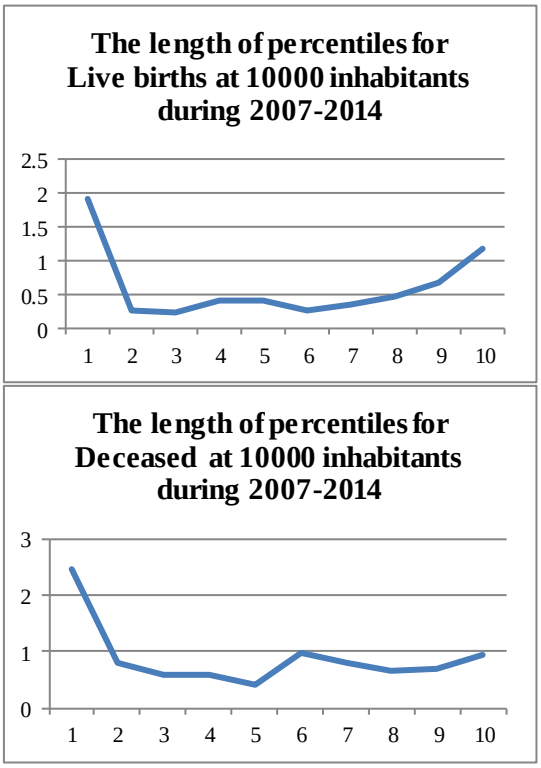
Regression analysis relative to indicator "Live births/10000 inh." gives us an equation: y=-0.022974702x+9.21916886 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. Regression analysis relative to indicator "Deceased/10000 inh." gives us an equation: y=0.002511123x+10.96341886 where x is the number of month (Jan, 2007=1), therefore a very small upward trend. Regression analysis relative to indicator

"Natural increase/10000 inh." gives us an equation: y=-0.025489691x+-1.74375 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Live births/10000 inh." is 8, for "Deceased/10000 inh." is 11 and for "Natural increase/10000 inh.": -3. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births/10000 inh.": (5.73,6.96,8.11,9.09,11.16), for "Deceased/10000 inh.": (7.82,10.1325,11.03,11.935,13.94) and for "Natural increase/10000 inh.": (-8.13,-4.545,-3.29,-1.23,0.77).

The arithmetic mean and the standard deviation for "Live births/10000 inh." are: (8,1.36), for "Deceased/10000 inh.": (11,1.24) and for "Natural increase/10000 inh.": (-3,2.14). This means that with a probability greather than 0.68 "Live births/10000 inh." are in the range [7,9], for "Deceased/10000 inh." in [10,12] and for "Natural increase/10000 inh." in [-5,-1].

Percentiles length indicators analysis (Figure 125) show that, indeed the concentration is around the middle of the data.



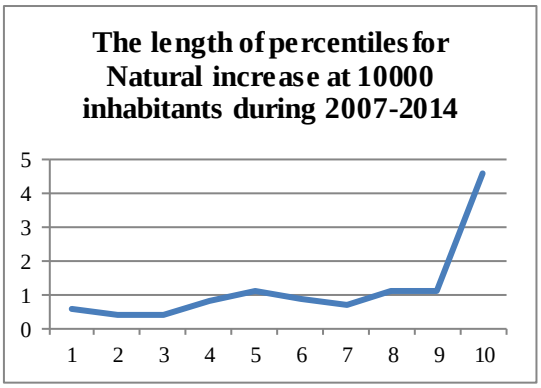


Figure 125

A comparison of the indicator "Live births" with the national level shows that it is better than the national, being better in 75% cases. For "Deceased" the indicator is worse than the national, being better only in 1.04% cases. Finally, for "Natural increase", the indicator is worse than the national, being better only in 14.58% cases.

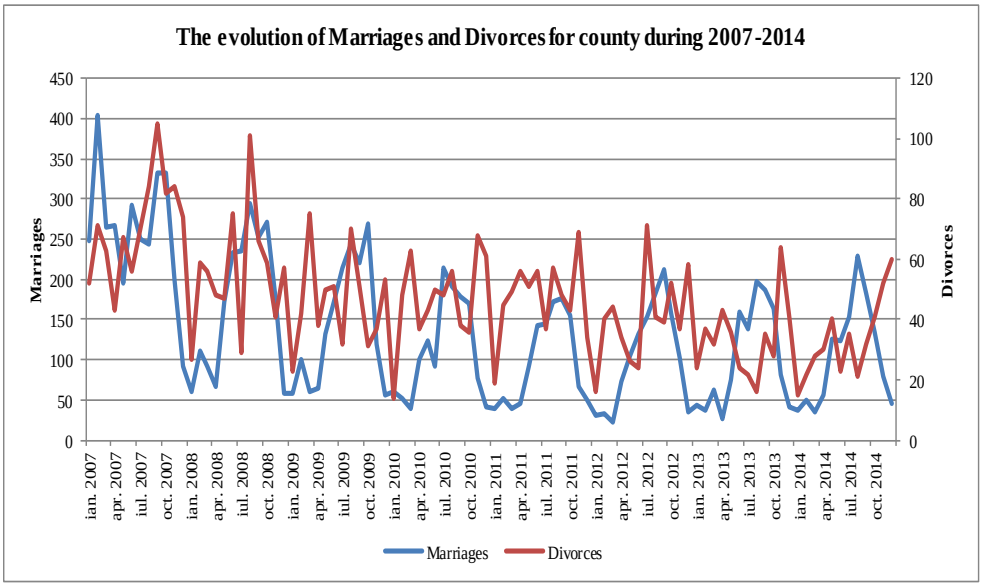


Figure 126

Regression analysis relative to indicator "Marriages" gives us an equation: y=-1.428696419x+205.5105263 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Divorces" gives us an equation: y=-0.355113945x+63.86885965 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

For the set of values above, the median indicator for "Marriages" is 125 and for "Divorces" is 44. Also, the distribution of quartiles is for "Marriages": (22,59.75,125,192.75,403) and for "Divorces": (14,34,43.5,57.25,105). The arithmetic mean and the standard deviation for "Marriages" are: (136,85.16) and for "Divorces": (47,18.63). This means that with a probability greather than 0.68 "Marriages" are in the range [51,221] and for "Divorces" in [28,66].

Percentiles length indicators analysis (Figure 127) show that, indeed the concentration is around the middle of the data.

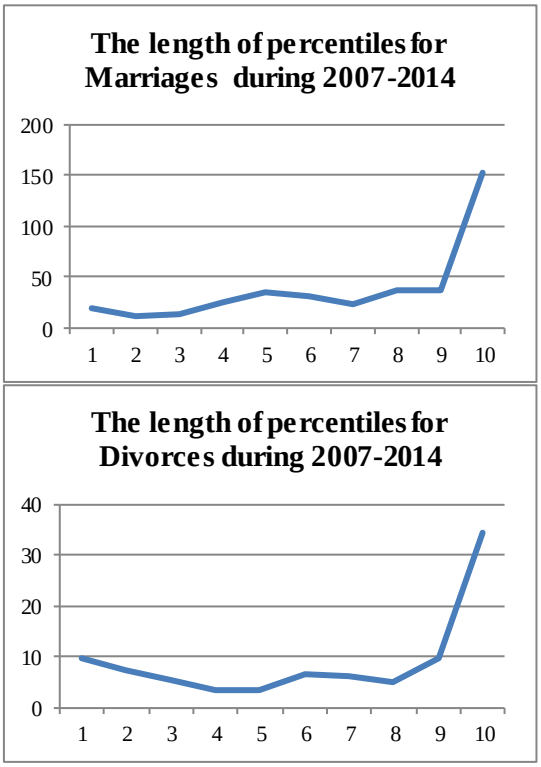


Figure 127

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Marriages/10000 inh. and Divorces/10000 inh. as in the figure 128.

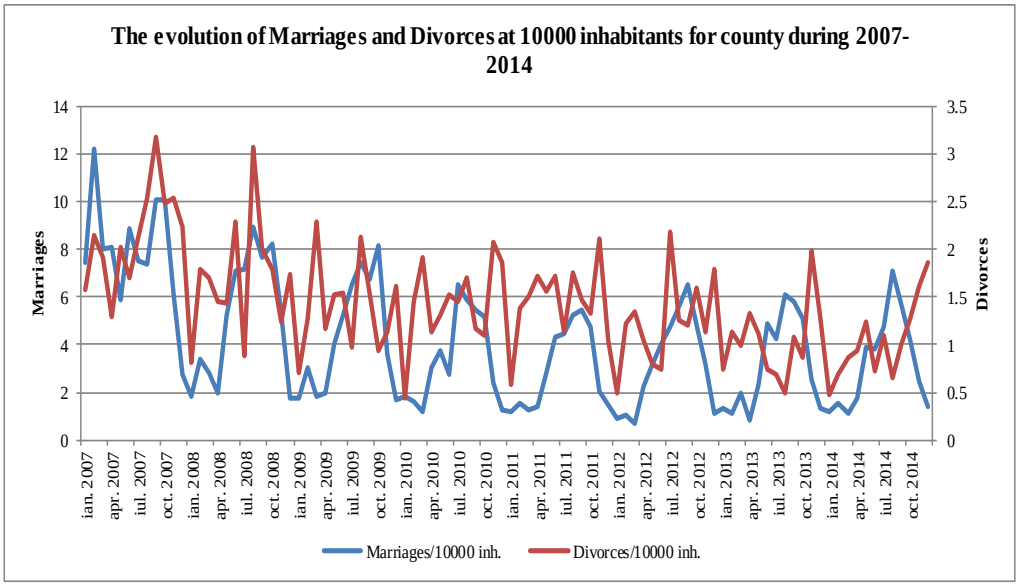


Figure 128

Regression analysis relative to indicator "Marriages/10000 inh." gives us an equation: y=-0.04226621x+6.211265351 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Divorces/10000 inh." gives us an equation: y=-0.010416983x+1.930848684 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Marriages/10000 inh." is 4 and for "Divorces/10000 inh." is 1. Also, the distribution of quartiles is for "Marriages/10000 inh.": (0.68,1.8125,3.875,5.87,12.2) and for "Divorces/10000 inh.": (0.43,1.0475,1.34,1.76,3.18). The arithmetic mean and the standard deviation for "Marriages/10000 inh." are: (4,2.58) and for "Divorces/10000 inh.": (1,0.56). This means that with a probability greather than 0.68 "Marriages/10000 inh." are in the range [1,7] and for "Divorces/10000 inh." in [0,2].

Percentiles length indicators analysis (Figure 129) show that, indeed the concentration is around the middle of the data.

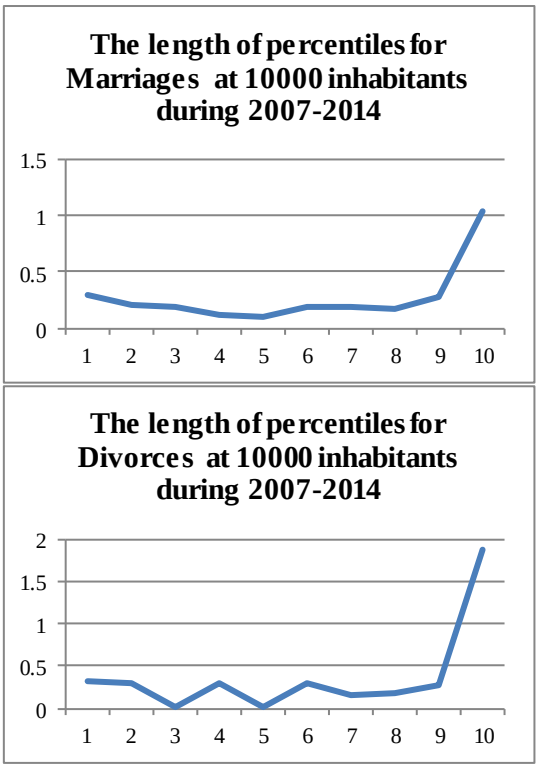


Figure 129

A comparison of the indicator "Marriages" with the national level shows that it is worse than the national, being better only in 23.96% cases. For "Divorces" the indicator is worse than the national, being better only in 30.21% cases.

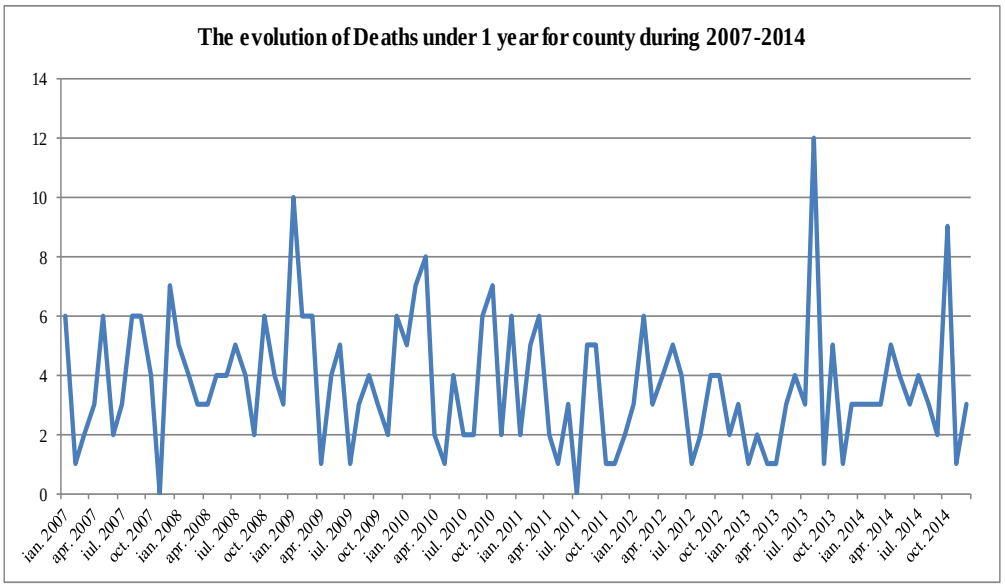


Figure 130

Regression analysis relative to indicator "Deaths under 1 year" gives us an equation: y=-0.010444927x+4.152412281 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Deaths under 1 year" is 3 and the distribution of quartiles is for "Deaths under 1 year": (0,2,3,5,12). The arithmetic mean and the standard deviation for "Deaths under 1 year" are: (4,2.17) which means that with a probability greather than 0.68 "Deaths under 1 year" are in the range [2,6].

Percentiles length indicators analysis (Figure 131) show that, indeed the concentration is around the middle of the data.

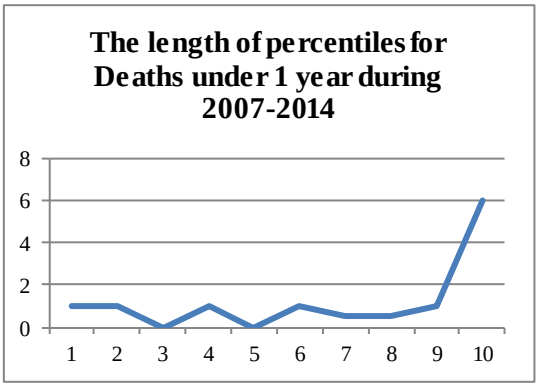


Figure 131

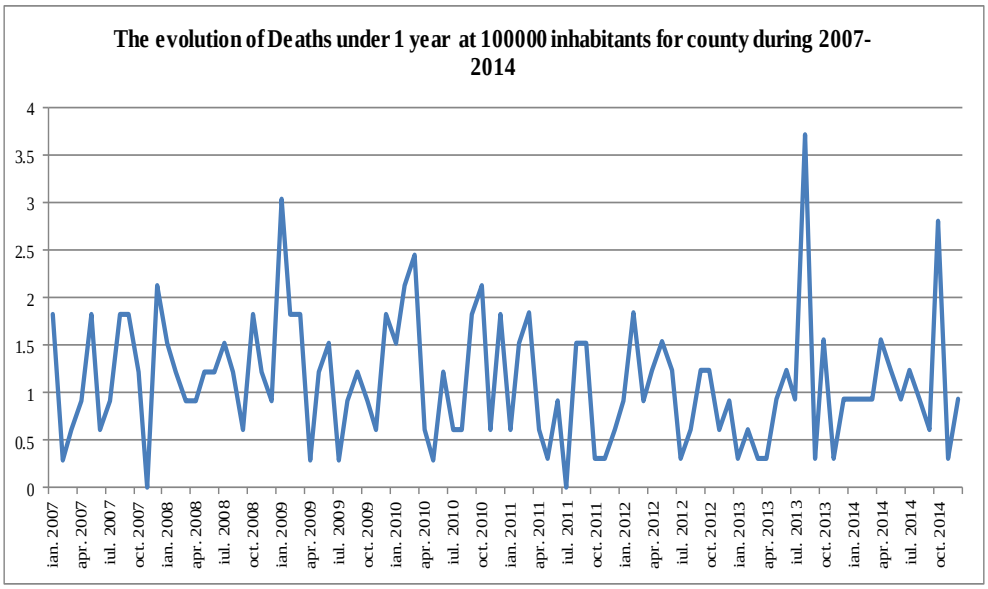


Figure 132

Regression analysis relative to indicator "Deaths under 1 year/100000 inh." gives us an equation: y=-0.002848684x+1.253473684 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Deaths under 1 year/100000 inh." is 1 and the distribution of quartiles is for "Deaths under 1 year/100000 inh.": (0,0.61,0.93,1.53,3.71). The arithmetic mean and the standard deviation for "Deaths under 1 year/100000 inh." are: (1,0.66) which means that with a probability greather than 0.68 "Deaths under 1 year/100000 inh." are in the range [0,2]. A comparison of the indicator "Deaths under 1 year" with the national level shows that it is worse than the national, being better only in 33.33% cases. A final analysis examines dependence aforementioned indicators of regional GDP variation.

Table 72. The evolution of Calarasi County GDP during 2007-2014

Year	GDP (in mil. lei 2007)	Variation (%)
2007	3161	-
2008	3983	26
2009	3470	-12.88
2010	4271	23.11
2011	4102	-3.97
2012	3949	-3.73
2013	3992	1.09
2014	3975	-0.42

Source: INSSE and own calculations

In what follows, we shall investigate if there is a dependency between GDP variation (noted with dGDP) and the aforementioned indicators.

Searching dependence annual variations of "Live births" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Deceased" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Natural increase" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Marriages" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Divorces" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Deaths under 1 year" from GDP, we find that there is not a dependence of the variation of GDP.

2.13. Analysis of Natural Movement of Caras-Severin County Population

Statistics of natural movement corresponding to Caras-Severin County are the following:

Table 73. The natural movement of Caras-Severin County population during 2007-2008

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,07	230	502	-272	235	49	8	ian,08	271	392	-121	90	21	4
feb,07	204	365	-161	427	47	4	feb,08	235	343	-108	140	80	2
mar,07	214	419	-205	213	55	3	mar,08	214	322	-108	122	46	4
apr,07	230	373	-143	188	64	2	apr,08	207	361	-154	82	59	4
mai,07	251	363	-112	216	52	3	mai,08	253	350	-97	194	67	7
iun,07	231	335	-104	226	57	3	iun,08	218	359	-141	171	47	6
iul,07	272	314	-42	312	34	4	iul,08	276	293	-17	242	50	4
aug,07	247	280	-33	324	45	3	aug,08	243	313	-70	414	50	6
sept,07	254	295	-41	303	31	3	sept,08	254	315	-61	245	63	3
oct,07	239	307	-68	213	37	2	oct,08	238	363	-125	191	28	3
nov,07	234	355	-121	153	39	3	nov,08	233	351	-118	127	43	6
dec,07	222	362	-140	116	39	4	dec,08	249	430	-181	105	57	8

Source: INSSE

Table 74. The natural movement of Caras-Severin County population during 2009-2010

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,09	260	390	-130	91	21	3	ian,10	236	415	-179	88	25	2
feb,09	203	349	-146	102	77	1	feb,10	226	359	-133	104	46	4
mar,09	226	416	-190	86	90	2	mar,10	242	395	-153	86	70	5
apr,09	207	362	-155	88	51	5	apr,10	188	374	-186	144	78	2
mai,09	193	336	-143	159	49	1	mai,10	206	348	-142	150	57	5
iun,09	241	336	-95	151	39	4	iun,10	227	337	-110	92	59	0
iul,09	268	323	-55	263	65	0	iul,10	236	331	-95	235	41	2
aug,09	299	344	-45	374	71	1	aug,10	247	298	-51	318	56	2
sept,09	284	271	13	247	29	2	sept,10	283	330	-47	209	54	1
oct,09	237	367	-130	208	69	4	oct,10	206	394	-188	160	28	2
nov,09	236	362	-126	99	60	5	nov,10	206	348	-142	88	47	3
dec,09	234	372	-138	95	61	3	dec,10	210	362	-152	73	57	3

Source: INSSE

Table 75. The natural movement of Caras-Severin County population during 2011-2012

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,11	196	372	-176	72	16	2	ian,12	197	316	-119	61	18	0
feb,11	190	387	-197	83	72	2	feb,12	209	381	-172	73	48	5
mar,11	176	396	-220	59	103	0	mar,12	189	399	-210	53	57	2
apr,11	169	351	-182	83	100	5	apr,12	170	370	-200	84	37	4
mai,11	218	345	-127	140	65	2	mai,12	204	310	-106	149	51	5
iun,11	191	347	-156	138	50	1	iun,12	201	297	-96	156	51	2
iul,11	224	287	-63	218	56	2	iul,12	211	323	-112	215	38	3
aug,11	248	335	-87	286	85	2	aug,12	240	282	-42	292	43	0
sept,11	221	330	-109	226	72	3	sept,12	201	258	-57	229	75	1
oct,11	226	310	-84	163	34	1	oct,12	216	304	-88	127	31	3
nov,11	233	325	-92	82	62	3	nov,12	220	315	-95	90	50	1
dec,11	162	354	-192	84	52	1	dec,12	174	369	-195	79	69	2

Source: INSSE

Table 76. The natural movement of Caras-Severin County population during 2013-2014

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,13	240	376	-136	65	16	2	ian,14	189	335	-146	63	9	1
feb,13	163	315	-152	67	66	2	feb,14	158	353	-195	86	38	2
mar,13	138	302	-164	73	66	2	mar,14	177	376	-199	75	41	0
apr,13	161	360	-199	69	58	4	apr,14	173	370	-197	93	41	3
mai,13	180	323	-143	130	77	2	mai,14	173	321	-148	150	43	2
iun,13	173	327	-154	174	54	3	iun,14	178	317	-139	140	42	3
iul,13	253	280	-27	206	27	1	iul,14	236	267	-31	219	28	0
aug,13	247	309	-62	290	22	1	aug,14	217	290	-73	324	26	3
sept,13	236	278	-42	191	45	2	sept,14	235	321	-86	203	63	1
oct,13	187	410	-223	188	26	2	oct,14	239	377	-138	158	44	4
nov,13	181	344	-163	83	42	3	nov,14	176	329	-153	84	68	1
dec,13	160	386	-226	80	39	1	dec,14	171	387	-216	114	68	3

Source: INSSE

Table 77. The population trends of Caras-Severin County during 2007-2014

Year	Population	Year	Population
2007	349636	2011	341789
2008	347793	2012	339232
2009	346172	2013	336783
2010	344258	2014	333843

Source: INSSE

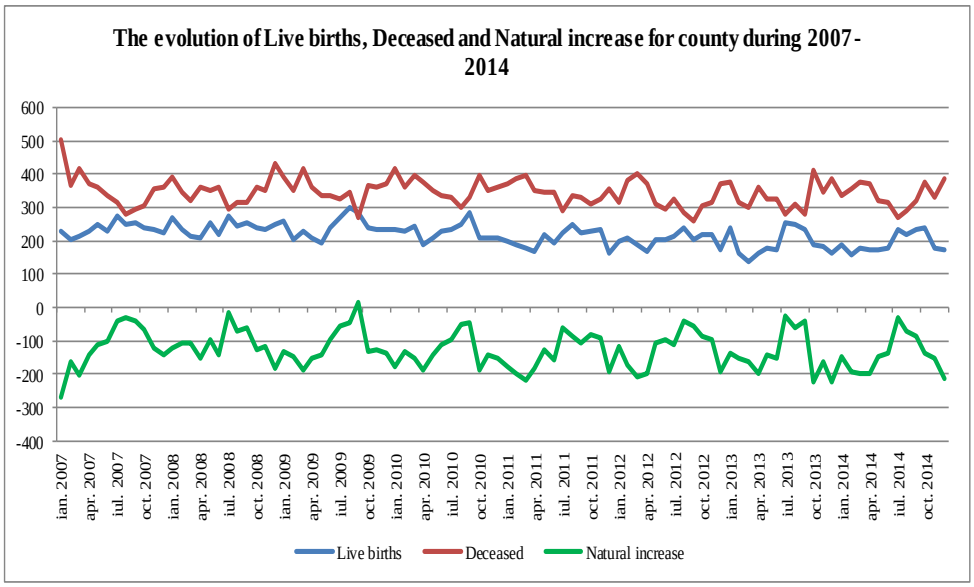


Figure 133

From figure 133 we can see a sinusoidal evolution of the indicator. Except months sept 2009 the natural increase was negative.

Regression analysis relative to indicator "Live births" gives us an equation: y=-0.628940586x+247.6598684 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Deceased" gives us an equation: y=-0.33665898x+361.0883772 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Natural increase" gives us an equation: y=-0.292281606x+-113.4285088 where x is the number of month (Jan, 2007=1), therefore a downward trend.

For the set of values above, the median indicator for "Live births" is 221, for "Deceased" is 346 and for "Natural increase": -135. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births": (138,190.75,220.5,239,299), for "Deceased": (258,315.75,346,370,502) and for "Natural increase": (-272,-163.25,-134.5,-91,13).

The arithmetic mean and the standard deviation for "Live births" are: (217,32.8), for "Deceased": (345,40.43) and for "Natural increase": (-128,56.04). This means

that with a probability greather than 0.68 “Live births” are in the range [184,250], for “Deceased” in [305,385] and for “Natural increase” in [-184,-72].

Percentiles length indicators analysis (Figure 134) show that, indeed the concentration is around the middle of the data.

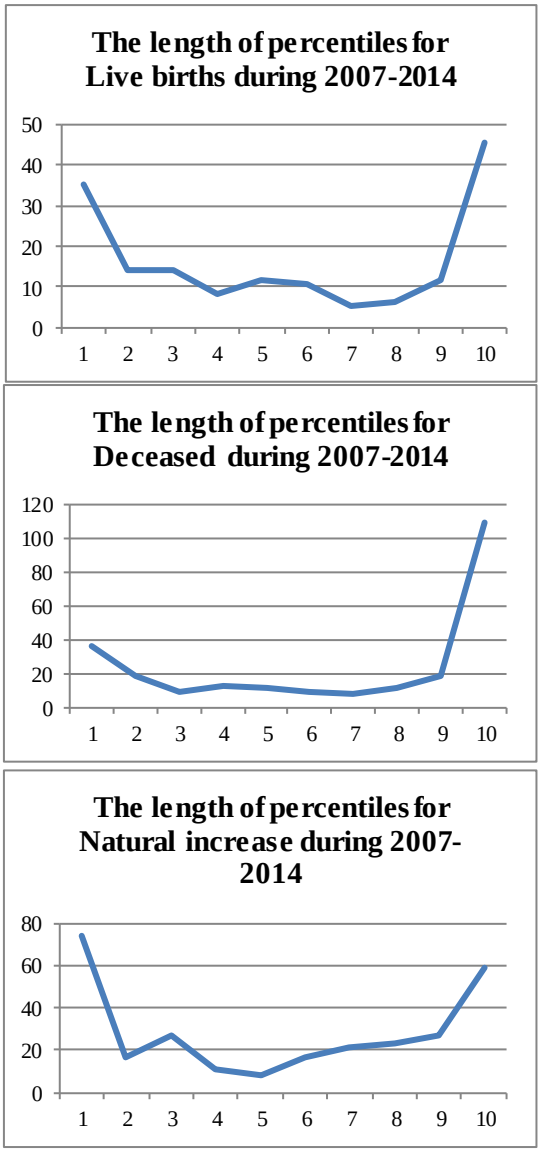


Figure 134

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Live births/10000 inh., Deceased/10000 inh. and Natural increase/10000 inh. as in the figure 135.

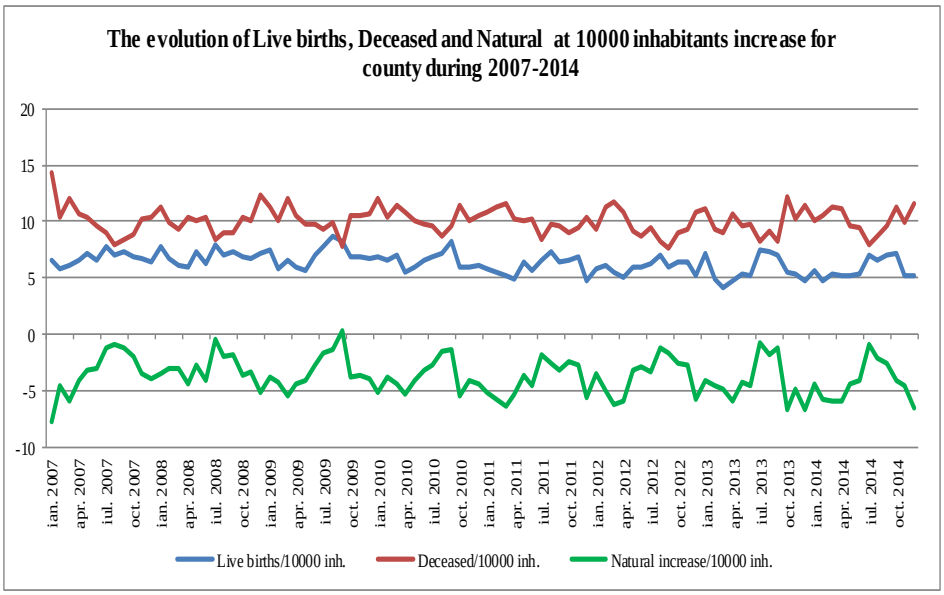


Figure 135

Regression analysis relative to indicator "Live births/10000 inh." gives us an equation: y=-0.014981484x+7.06108114 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Deceased/10000 inh." gives us an equation: y=-0.004395279x+10.27962939 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Natural increase/10000 inh." gives us an equation: y=-0.010595971x+-3.217241228 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Live births/10000 inh." is 6, for "Deceased/10000 inh." is 10 and for "Natural increase/10000 inh.": -4. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births/10000 inh.": (4.1,5.5875,6.48,7.015,8.64), for "Deceased/10000 inh.": (7.61,9.3125,10.085,10.7775,14.36) and for "Natural increase/10000 inh.": (-7.78,-4.8475,-3.925,-2.665,0.38).

The arithmetic mean and the standard deviation for “Live births/10000 inh.” are: (6,0.91), for “Deceased/10000 inh.”: (10,1.16) and for “Natural increase/10000 inh.”: (-4,1.65). This means that with a probability greather than 0.68 “Live births/10000 inh.” are in the range [5,7], for “Deceased/10000 inh.” in [9,11] and for “Natural increase/10000 inh.” in [-6,-2].

Percentiles length indicators analysis (Figure 136) show that, indeed the concentration is around the middle of the data.

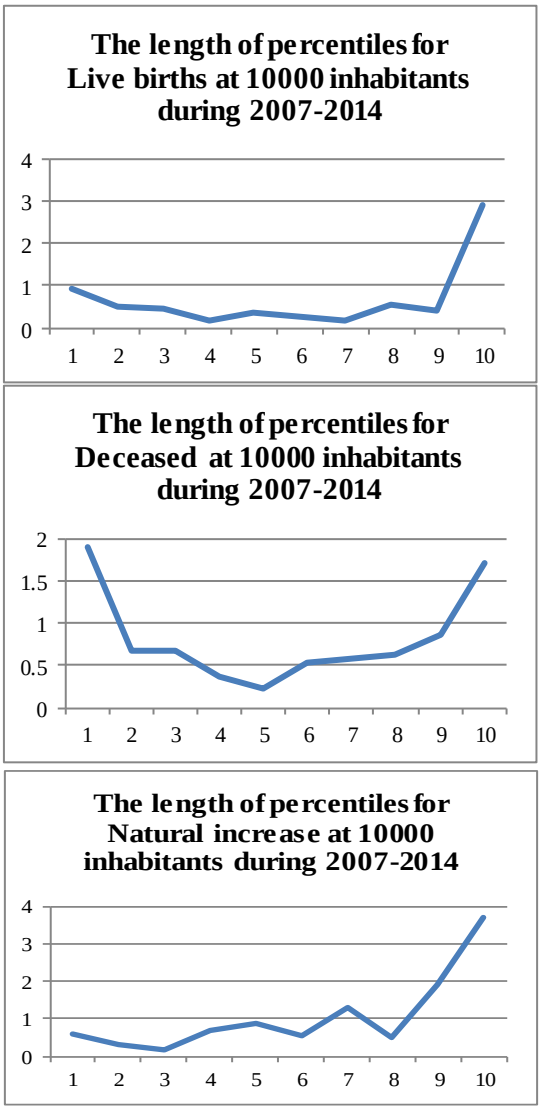


Figure 136

A comparison of the indicator "Live births" with the national level shows that it is worse than the national, being better only in 1.04% cases. For "Deceased" the indicator is worse than the national, being better only in 13.54% cases. Finally, for "Natural increase", the indicator is worse than the national, being better only in 0% cases.

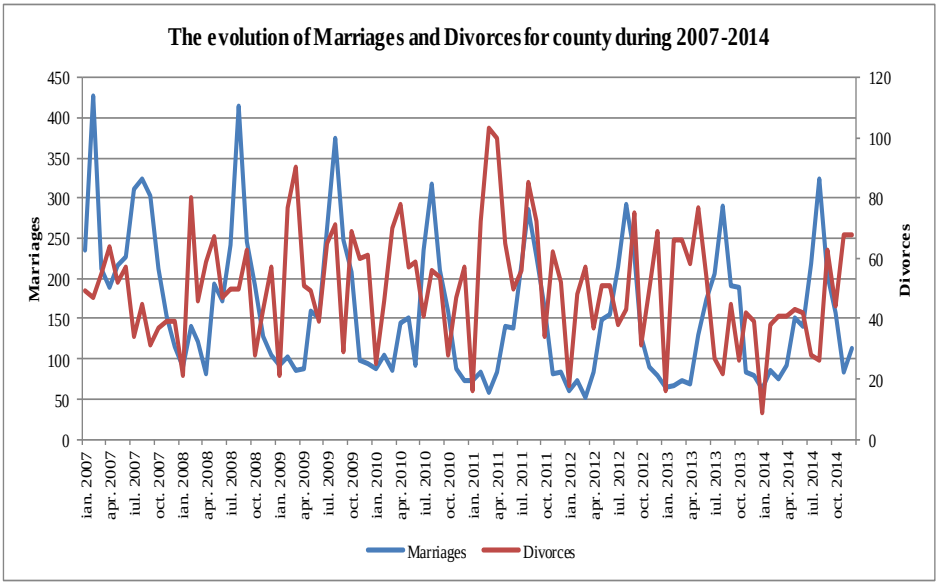


Figure 137

Regression analysis relative to indicator "Marriages" gives us an equation: y=-0.917091698x+204.1247807 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Divorces" gives us an equation: y=-0.065545307x+53.6372807 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Marriages" is 142 and for "Divorces" is 50. Also, the distribution of quartiles is for "Marriages": (53,86,142,213.5,427) and for "Divorces": (9,39,50,63,103). The arithmetic mean and the standard deviation for "Marriages" are: (160,84.91) and for "Divorces": (50,18.4). This means that with a probability greather than 0.68 "Marriages" are in the range [75,245] and for "Divorces" in [32,68].

Percentiles length indicators analysis (Figure 138) show that, indeed the concentration is around the middle of the data.

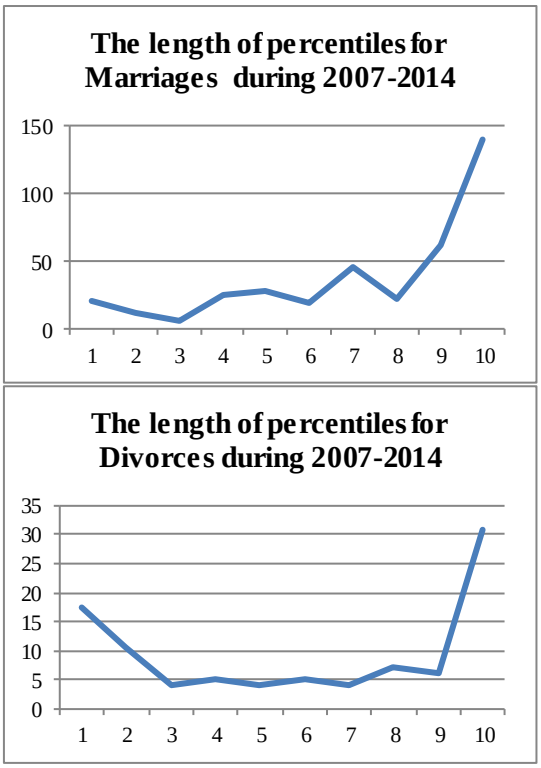


Figure 138

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Marriages/10000 inh. and Divorces/10000 inh. as in the figure 139.

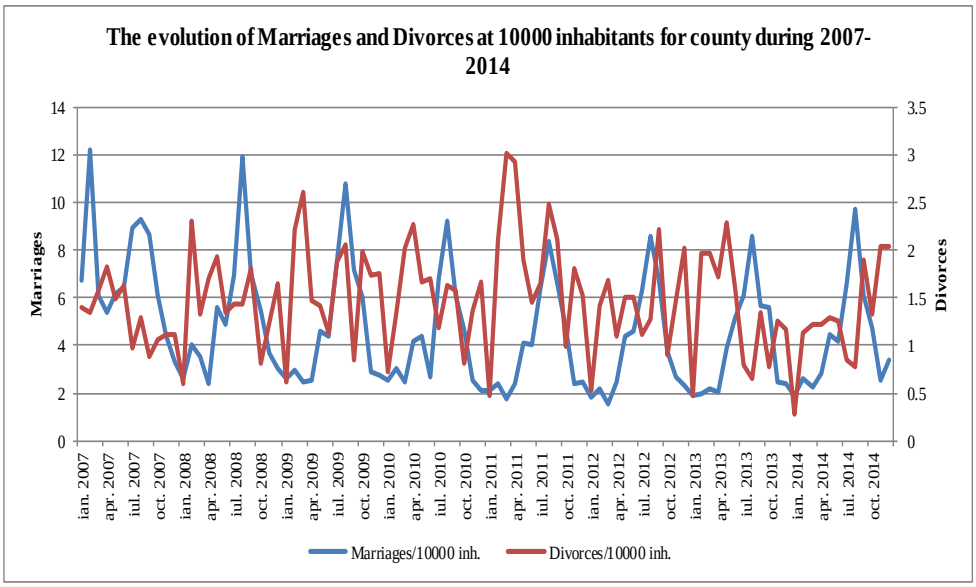


Figure 139

Regression analysis relative to indicator "Marriages/10000 inh." gives us an equation: y=-0.024022789x+5.81739693 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Divorces/10000 inh." gives us an equation: y=-0.001179531x+1.530436404 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Marriages/10000 inh." is 4 and for "Divorces/10000 inh." is 1. Also, the distribution of quartiles is for "Marriages/10000 inh.": (1.56,2.535,4.185,6.135,12.21) and for "Divorces/10000 inh.": (0.27,1.1275,1.45,1.815,3.01). The arithmetic mean and the standard deviation for "Marriages/10000 inh." are: (5,2.45) and for "Divorces/10000 inh.": (1,0.54). This means that with a probability greather than 0.68 "Marriages/10000 inh." are in the range [3,7] and for "Divorces/10000 inh." in [0,2].

Percentiles length indicators analysis (Figure 140) show that, indeed the concentration is around the middle of the data.

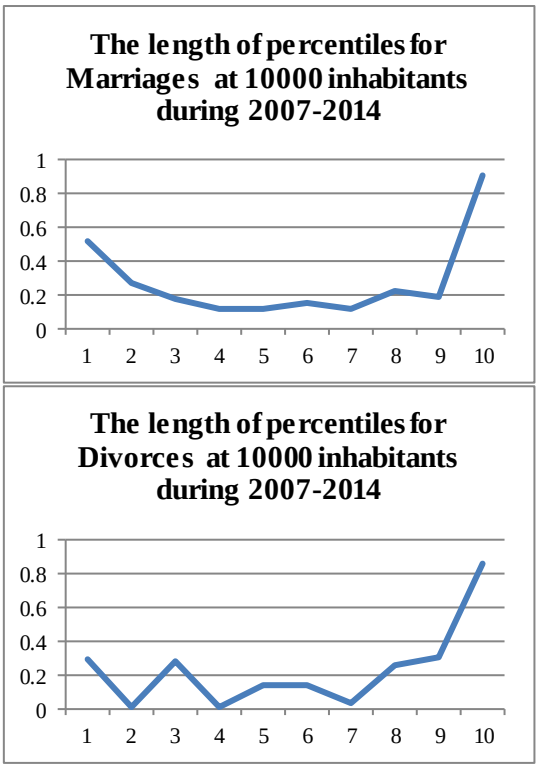


Figure 140

A comparison of the indicator "Marriages" with the national level shows that it is about the same with the national, being better in 50% cases. For "Divorces" the indicator is worse than the national, being better only in 25% cases.

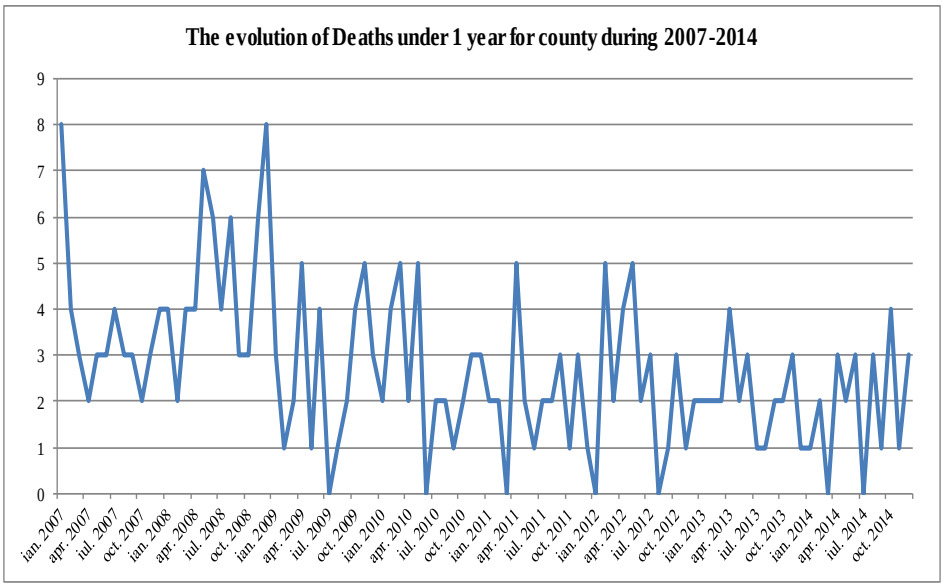


Figure 141

Regression analysis relative to indicator "Deaths under 1 year" gives us an equation: y=-0.025264514x+3.944078947 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Deaths under 1 year" is 3 and the distribution of quartiles is for "Deaths under 1 year": (0,2,2.5,4,8). The arithmetic mean and the standard deviation for "Deaths under 1 year" are: (3,1.69) which means that with a probability greather than 0.68 "Deaths under 1 year" are in the range [1,5]. Percentiles length indicators analysis (Figure 142) show that, indeed the concentration is around the middle of the data.

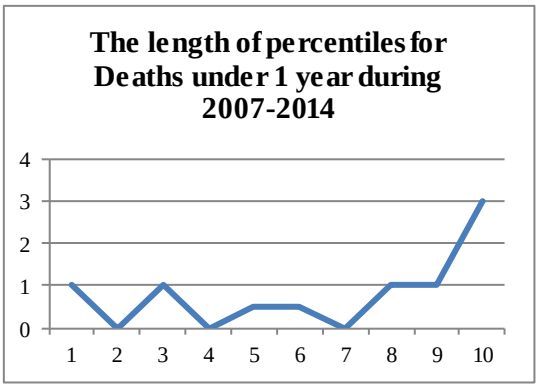


Figure 142

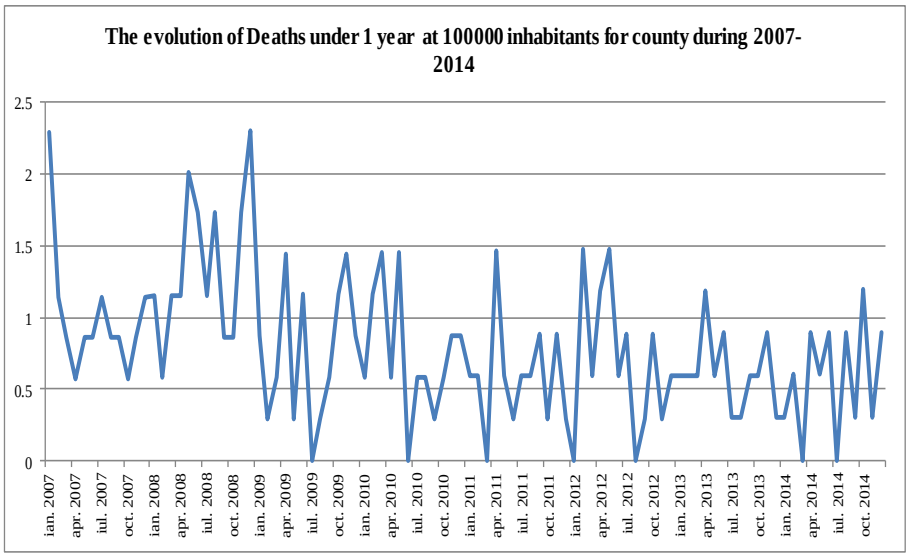


Figure 143

Regression analysis relative to indicator "Deaths under 1 year/100000 inh." gives us an equation: y=-0.00694296x+1.127879386 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Deaths under 1 year/100000 inh." is 1 and the distribution of quartiles is for "Deaths under 1 year/100000 inh.": (0,0.5775,0.73,1.14,2.3). The arithmetic mean and the standard deviation for "Deaths under 1 year/100000 inh." are: (1,0.49) which means that with a probability greather than 0.68 "Deaths under 1 year/100000 inh." are in the range [1,1]. A comparison of the indicator "Deaths under 1 year" with the national level shows that it is about the same with the national, being better in 54.17% cases. A final analysis examines dependence aforementioned indicators of regional GDP variation.

Table 78. The evolution of Caras-Severin County GDP during 2007-2014

Year	GDP (in mil. lei 2007)	Variation (%)
2007	5233	-
2008	5319	1.65
2009	5338	0.36
2010	5236	-1.9
2011	4848	-7.43
2012	4978	2.68
2013	4668	-6.23
2014	4646	-0.47

Source: INSSE and own calculations

In what follows, we shall investigate if there is a dependency between GDP variation (noted with dGDP) and the aforementioned indicators.

Searching dependence annual variations of "Live births" from GDP, we find that there is a dependence of Live births from GDP in the current year and the regression equation is: 0.916dGDP+-1.2161. Searching dependence annual variations of "Deceased" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Natural increase" from GDP, we find that there is a dependence of Natural increase from GDP offset by 1 year and the regression equation is:1.8732dGDP+8.5936. Searching dependence annual variations of "Marriages" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Divorces" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Deaths under 1 year" from GDP, we find that there is not a dependence of the variation of GDP.

2.14. Analysis of Natural Movement of Cluj County Population

Statistics of natural movement corresponding to Cluj County are the following:

Table 79. The natural movement of Cluj County population during 2007-2008

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,07	537	781	-244	199	100	7	ian,08	569	663	-94	90	2	5
feb,07	454	625	-171	391	97	4	feb,08	492	687	-195	160	124	7
mar,07	461	661	-200	228	95	5	mar,08	526	711	-185	216	90	6
apr,07	459	689	-230	348	100	4	apr,08	512	634	-122	117	74	4
mai,07	519	656	-137	482	75	2	mai,08	574	647	-73	573	114	9
iun,07	556	587	-31	494	79	5	iun,08	529	604	-75	509	111	6
iul,07	607	667	-60	758	59	5	iul,08	612	613	-1	675	114	4
aug,07	575	584	-9	745	29	5	aug,08	528	576	-48	880	151	7
sept,07	518	595	-77	763	79	2	sept,08	581	574	7	605	115	7
oct,07	535	609	-74	454	143	2	oct,08	579	683	-104	457	106	3
nov,07	528	668	-140	267	120	4	nov,08	531	636	-105	211	81	8
dec,07	528	710	-182	120	77	6	dec,08	539	696	-157	84	101	2

Source: INSSE

Table 80. The natural movement of Cluj County population during 2009-2010

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,09	552	735	-183	118	10	0	ian,10	507	653	-146	121	15	1
feb,09	510	669	-159	184	97	5	feb,10	551	635	-84	145	124	2
mar,09	582	717	-135	107	142	6	mar,10	566	724	-158	112	75	7
apr,09	588	648	-60	142	166	3	apr,10	532	634	-102	253	111	2
mai,09	539	624	-85	612	113	1	mai,10	497	656	-159	549	103	3
iun,09	569	585	-16	423	142	5	iun,10	671	675	-4	270	90	1
iul,09	633	659	-26	761	55	9	iul,10	624	595	29	753	57	1
aug,09	559	549	10	720	84	2	aug,10	608	623	-15	653	71	6
sept,09	670	605	65	639	54	5	sept,10	615	627	-12	601	73	4
oct,09	581	633	-52	464	82	2	oct,10	521	679	-158	411	82	3
nov,09	588	645	-57	172	35	2	nov,10	563	679	-116	142	98	3
dec,09	559	737	-178	109	79	5	dec,10	600	719	-119	83	68	8

Source: INSSE

Table 81. The natural movement of Cluj County population during 2011-2012

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,11	506	717	-211	92	15	4	ian,12	494	687	-193	103	63	3
feb,11	461	679	-218	137	88	1	feb,12	518	703	-185	161	83	1
mar,11	521	699	-178	121	101	7	mar,12	499	715	-216	119	102	5
apr,11	427	649	-222	157	99	3	apr,12	474	722	-248	214	79	2
mai,11	550	706	-156	505	106	2	mai,12	525	655	-130	465	95	2
iun,11	525	608	-83	400	82	4	iun,12	487	677	-190	437	63	2
iul,11	572	583	-11	693	64	1	iul,12	594	659	-65	611	63	3
aug,11	614	585	29	560	107	5	aug,12	619	622	-3	647	71	3
sept,11	627	524	103	537	115	2	sept,12	577	579	-2	626	98	2
oct,11	507	636	-129	351	97	0	oct,12	605	626	-21	334	83	4
nov,11	523	670	-147	132	119	5	nov,12	490	606	-116	155	90	1
dec,11	459	714	-255	95	73	2	dec,12	454	765	-311	95	75	3

Source: INSSE

Table 82. The natural movement of Cluj County population during 2013-2014

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,13	534	677	-143	89	26	6	ian,14	524	710	-186	127	21	4
feb,13	451	660	-209	125	71	3	feb,14	458	621	-163	215	55	3
mar,13	405	715	-310	206	79	5	mar,14	524	690	-166	236	94	2
apr,13	476	666	-190	125	87	4	apr,14	527	665	-138	299	76	8
mai,13	479	635	-156	461	74	5	mai,14	533	623	-90	741	35	3
iun,13	494	628	-134	541	56	2	iun,14	543	593	-50	501	33	5
iul,13	628	637	-9	599	37	5	iul,14	632	589	43	643	39	4
aug,13	599	619	-20	715	43	5	aug,14	594	604	-10	822	43	1
sept,13	574	573	1	517	66	3	sept,14	644	626	18	619	98	6
oct,13	581	686	-105	381	37	3	oct,14	588	662	-74	421	39	2
nov,13	505	619	-114	202	46	5	nov,14	530	678	-148	272	72	4
dec,13	488	663	-175	127	59	3	dec,14	464	754	-290	187	57	4

Source: INSSE

Table 83. The population trends of Cluj County during 2007-2014

Year	Population	Year	Population
2007	706855	2011	714380
2008	707647	2012	715765
2009	709230	2013	716935
2010	710977	2014	718404

Source: INSSE

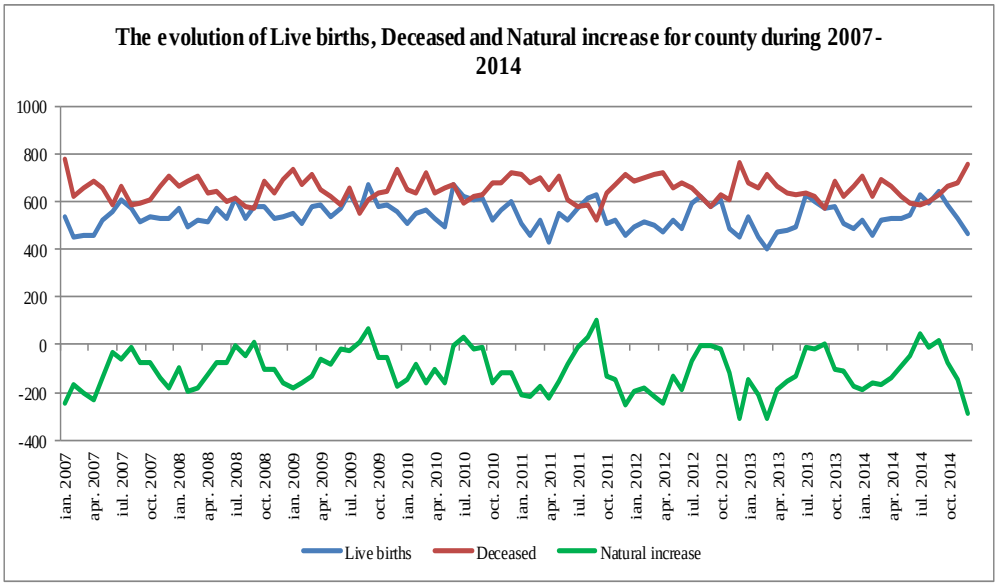


Figure 144

From figure 144 we can see a sinusoidal evolution of the indicator. Except months sept 2008, aug 2009, sept 2009, iul 2010, aug 2011, sept 2011, sept 2013, iul 2014, sept 2014 the natural increase was negative.

Regression analysis relative to indicator "Live births" gives us an equation: y=-0.101973684x+546.997807 where x is the number of month (Jan, 2007=1), therefore a downward trend.

Regression analysis relative to indicator "Deceased" gives us an equation: y=0.009400434x+652.0440789 where x is the number of month (Jan, 2007=1), therefore an upward trend.

Regression analysis relative to indicator "Natural increase" gives us an equation: y=-0.111374118x+-105.0462719 where x is the number of month (Jan, 2007=1), therefore a downward trend.

For the set of values above, the median indicator for "Live births" is 534, for "Deceased" is 656 and for "Natural increase": -118. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births": (405,506.75,533.5,581,671), for "Deceased": (524,620.5,655.5,686.25,781) and for "Natural increase": (-311,-175.75,-117.5,-43.75,103).

The arithmetic mean and the standard deviation for "Live births" are: (542,55.07), for "Deceased": (653,49.59) and for "Natural increase": (-110,86.6). This means

that with a probability greather than 0.68 “Live births” are in the range [487,597], for “Deceased” in [603,703] and for “Natural increase” in [-197,-23].

Percentiles length indicators analysis (Figure 145) show that, indeed the concentration is around the middle of the data.

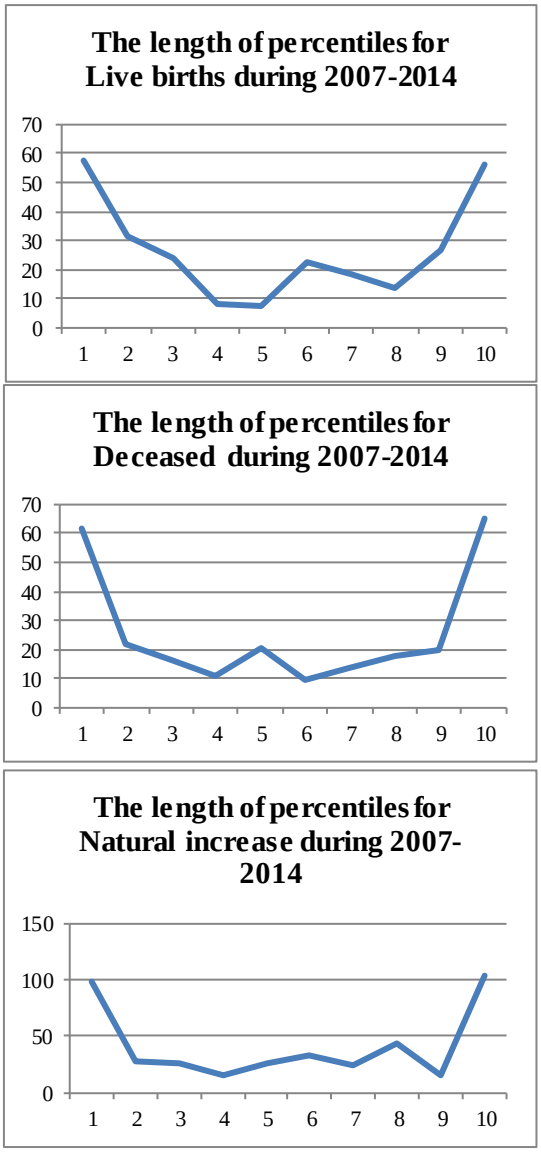


Figure 145

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Live births/10000 inh., Deceased/10000 inh. and Natural increase/10000 inh. as in the figure 146.

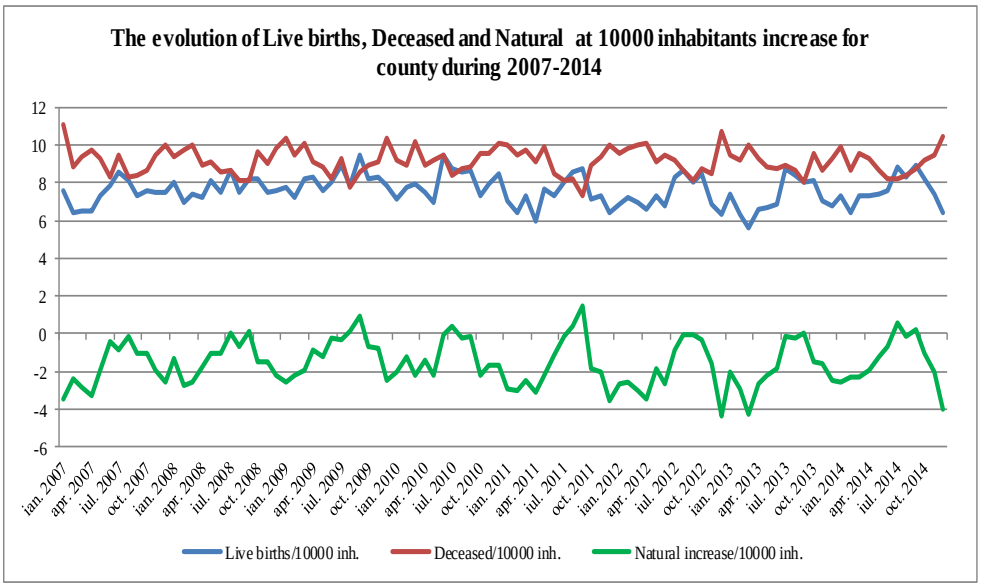


Figure 146

Regression analysis relative to indicator "Live births/10000 inh." gives us an equation: y=-0.002980195x+7.752872807 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Deceased/10000 inh." gives us an equation: y=-0.001755222x+9.242732456 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Natural increase/10000 inh." gives us an equation: y=-0.001242811x+-1.488890351 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Live births/10000 inh." is 7, for "Deceased/10000 inh." is 9 and for "Natural increase/10000 inh.": -2. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births/10000 inh.": (5.65,7.095,7.49,8.1825,9.45), for "Deceased/10000 inh.": (7.34,8.655,9.195,9.6,11.05) and for "Natural increase/10000 inh.": (-4.35,-2.4525,-1.65,-0.62,1.44).

The arithmetic mean and the standard deviation for "Live births/10000 inh." are: (8,0.78), for "Deceased/10000 inh.": (9,0.7) and for "Natural increase/10000 inh.": (-2,1.21). This means that with a probability greather than 0.68 "Live births/10000 inh." are in the range [7,9], for "Deceased/10000 inh." in [8,10] and for "Natural increase/10000 inh." in [-3,-1].

Percentiles length indicators analysis (Figure 147) show that, indeed the concentration is around the middle of the data.

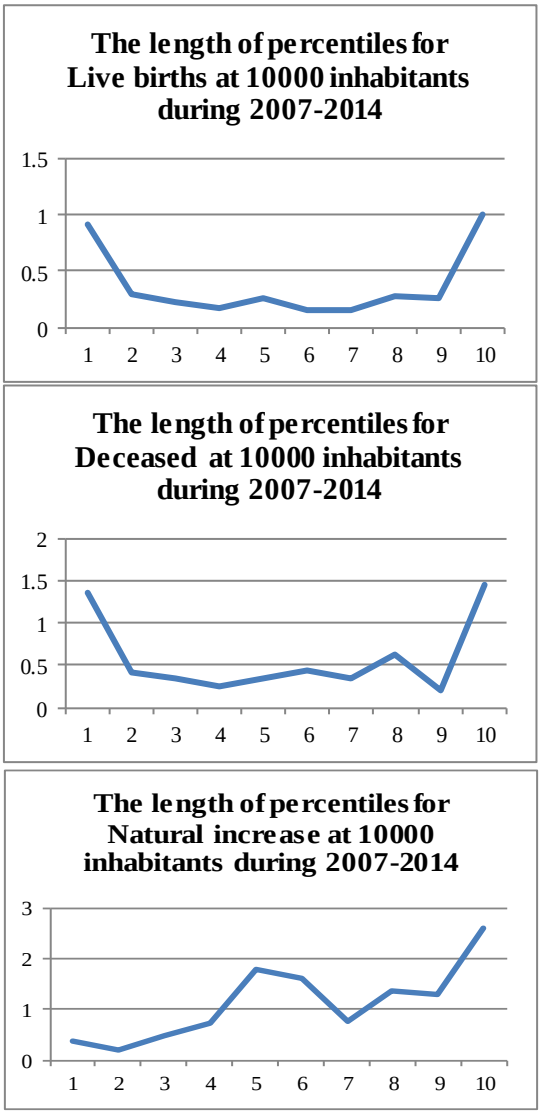


Figure 147

A comparison of the indicator "Live births" with the national level shows that it is about the same with the national, being better in 40.63% cases. For "Deceased" the indicator is better than the national, being better in 73.96% cases. Finally, for "Natural increase", the indicator is better than the national, being better in 64.58% cases.

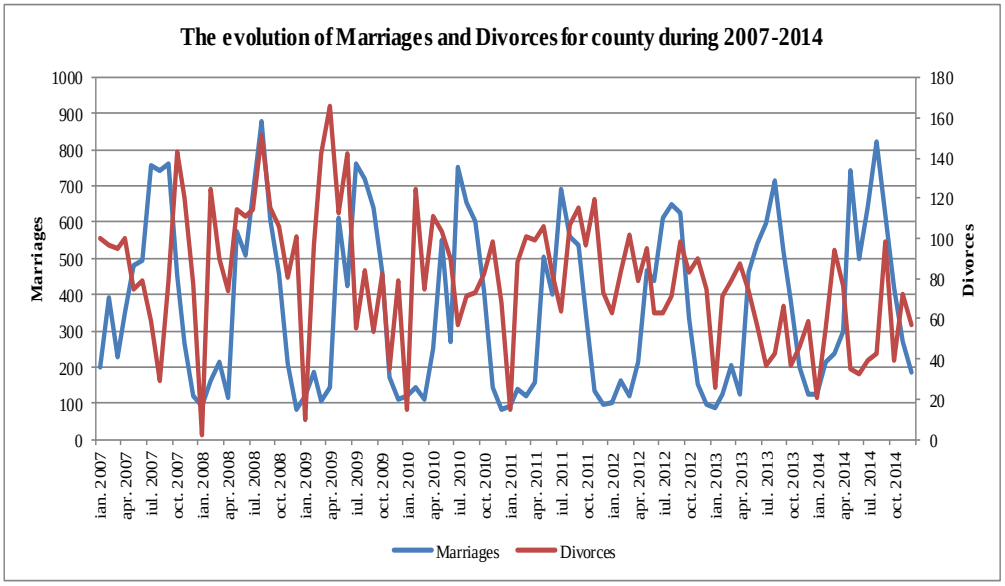


Figure 148

Regression analysis relative to indicator "Marriages" gives us an equation: y=-0.195618557x+377.0708333 where x is the number of month (Jan, 2007=1), therefore a downward trend.

Regression analysis relative to indicator "Divorces" gives us an equation: y=-0.433423766x+100.5627193 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

For the set of values above, the median indicator for "Marriages" is 341 and for "Divorces" is 79. Also, the distribution of quartiles is for "Marriages": (83,142,341,563.25,880) and for "Divorces": (2,59,79,100,166). The arithmetic mean and the standard deviation for "Marriages" are: (368,230.09) and for "Divorces": (80,32.12). This means that with a probability greather than 0.68 "Marriages" are in the range [138,598] and for "Divorces" in [48,112].

Percentiles length indicators analysis (Figure 149) show that, indeed the concentration is around the middle of the data.

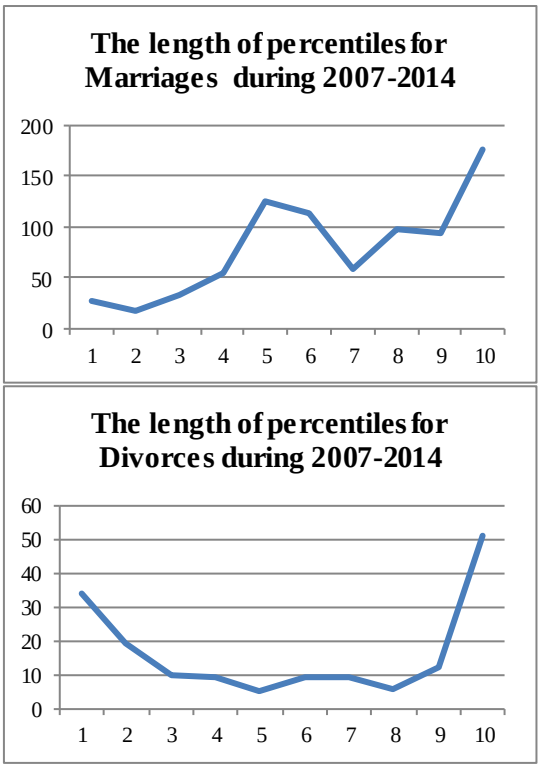


Figure 149

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Marriages/10000 inh. and Divorces/10000 inh. as in the figure 150.

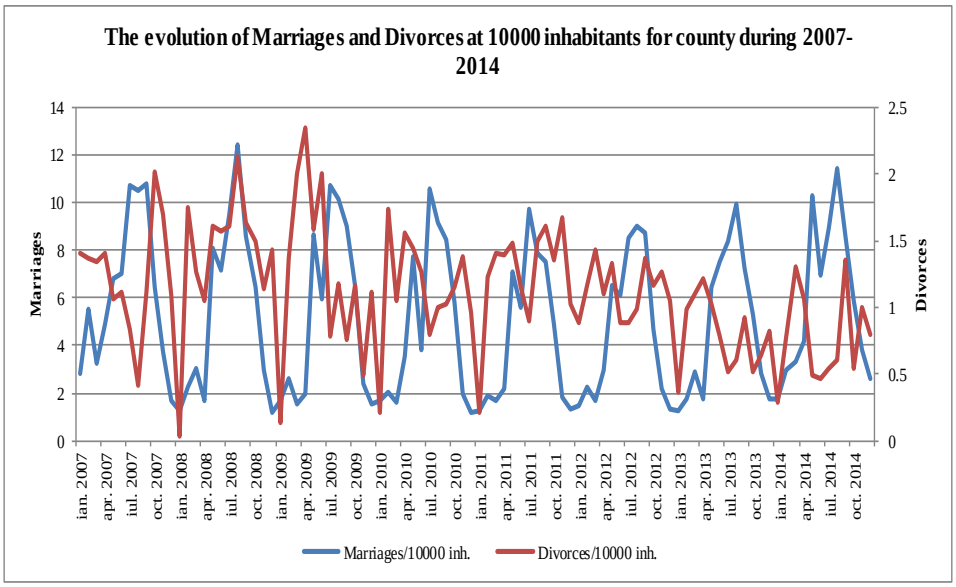


Figure 150

Regression analysis relative to indicator "Marriages/10000 inh." gives us an equation: y=-0.003888972x+5.348927632 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Divorces/10000 inh." gives us an equation: y=-0.006292187x+1.422254386 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Marriages/10000 inh." is 5 and for "Divorces/10000 inh." is 1. Also, the distribution of quartiles is for "Marriages/10000 inh.": (1.17,2,4.79,7.905,12.44) and for "Divorces/10000 inh.": (0.03,0.8275,1.12,1.41,2.34). The arithmetic mean and the standard deviation for "Marriages/10000 inh." are: (5,3.23) and for "Divorces/10000 inh.": (1,0.45). This means that with a probability greather than 0.68 "Marriages/10000 inh." are in the range [2,8] and for "Divorces/10000 inh." in [1,1].

Percentiles length indicators analysis (Figure 151) show that, indeed the concentration is around the middle of the data.

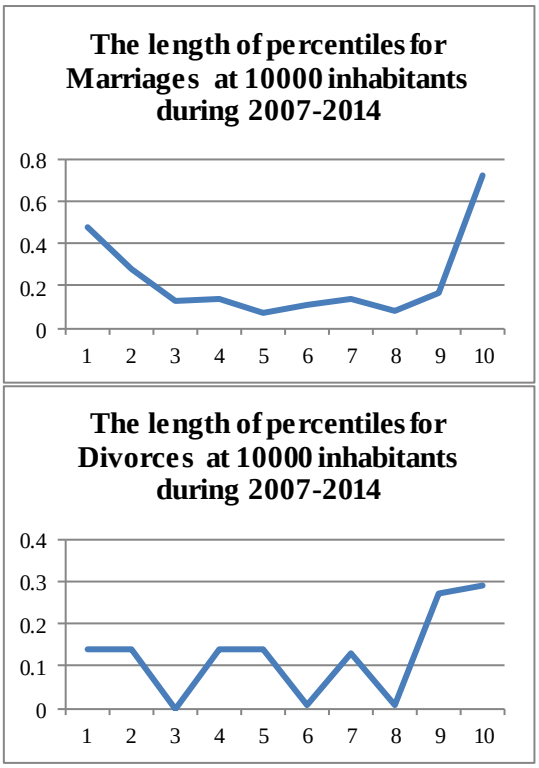


Figure 151

A comparison of the indicator "Marriages" with the national level shows that it is about the same with the national, being better in 54.17% cases. For "Divorces" the indicator is better than the national, being better in 62.5% cases.

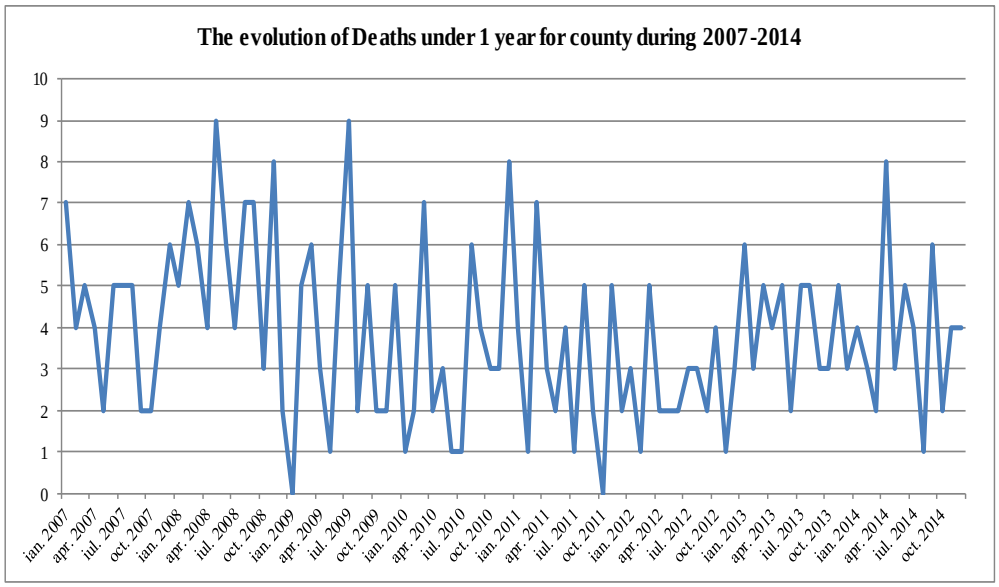


Figure 152

Regression analysis relative to indicator "Deaths under 1 year" gives us an equation: y=-0.014765328x+4.539035088 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Deaths under 1 year" is 4 and the distribution of quartiles is for "Deaths under 1 year": (0,2,4,5,9). The arithmetic mean and the standard deviation for "Deaths under 1 year" are: (4,2.04) which means that with a probability greather than 0.68 "Deaths under 1 year" are in the range [2,6]. Percentiles length indicators analysis (Figure 153) show that, indeed the concentration is around the middle of the data.

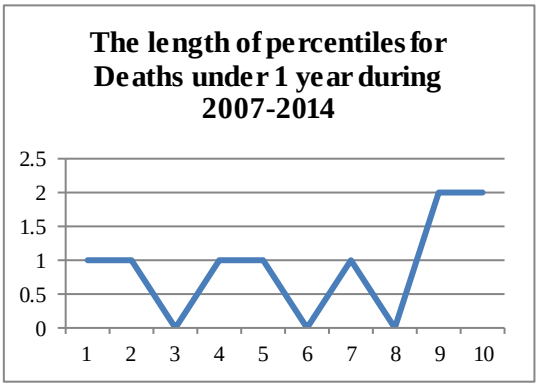


Figure 153

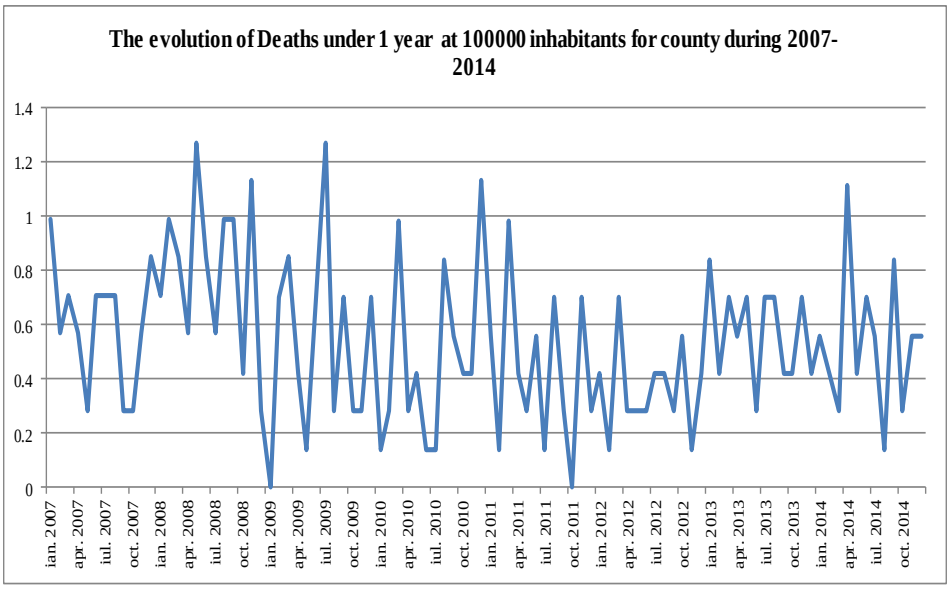


Figure 154

Regression analysis relative to indicator "Deaths under 1 year/100000 inh." gives us an equation: y=-0.002171663x+0.642721491 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Deaths under 1 year/100000 inh." is 1 and the distribution of quartiles is for "Deaths under 1 year/100000 inh.": (0,0.28,0.56,0.7,1.27). The arithmetic mean and the standard deviation for "Deaths under 1 year/100000 inh." are: (1,0.29) which means that with a probability greather than 0.68 "Deaths under 1 year/100000 inh." are in the range [1,1]. A comparison of the indicator "Deaths under 1 year" with the national level shows that it is better than the national, being better in 78.13% cases. A final analysis examines dependence aforementioned indicators of regional GDP variation.

Table 84. The evolution of Cluj County GDP during 2007-2014

Year	GDP (in mil. lei 2007)	Variation (%)
2007	18083	-
2008	18042	-0.23
2009	17264	-4.31
2010	16990	-1.59
2011	17289	1.76
2012	18418	6.53
2013	19169	4.08
2014	20268	5.73

Source: INSSE and own calculations

In what follows, we shall investigate if there is a dependency between GDP variation (noted with dGDP) and the aforementioned indicators.

Searching dependence annual variations of "Live births" from GDP, we find that there is a dependence of Live births from GDP offset by 2 years and the regression equation is:1.0566dGDP+-1.4444. Searching dependence annual variations of "Deceased" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Natural increase" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Marriages" from GDP, we find that there is a dependence of Marriages from GDP in the current year and the regression equation is: 2.0486dGDP+-3.3459we find that there is a dependence of Marriages from GDP offset by 1 year and the regression equation is:2.0886dGDP+0.1446we find that there is a dependence of Marriages from GDP offset by 2 years and the regression equation is:2.7905dGDP+2.1245. Searching dependence annual variations of "Divorces" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Deaths under 1 year" from GDP, we find that there is not a dependence of the variation of GDP.

2.15. Analysis of Natural Movement of Constanta County Population

Statistics of natural movement corresponding to Constanta County are the following:

Table 85. The natural movement of Constanta County population during 2007-2008

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,07	618	714	-96	484	90	9	ian,08	774	689	85	173	16	16
feb,07	551	606	-55	622	80	13	feb,08	644	637	7	331	84	6
mar,07	624	639	-15	437	95	9	mar,08	657	652	5	322	100	17
apr,07	601	627	-26	539	85	10	apr,08	594	589	5	224	82	7
mai,07	651	552	99	404	78	4	mai,08	625	663	-38	393	88	9
iun,07	652	578	74	543	87	7	iun,08	699	597	102	600	64	12
iul,07	737	611	126	644	51	5	iul,08	780	559	221	612	82	8
aug,07	746	559	187	810	39	5	aug,08	689	553	136	853	96	7
sept,07	668	539	129	1004	75	6	sept,08	743	586	157	820	40	12
oct,07	703	648	55	753	96	8	oct,08	775	676	99	749	65	12
nov,07	629	620	9	443	94	12	nov,08	705	631	74	417	62	4
dec,07	679	696	-17	262	87	7	dec,08	712	688	24	270	76	6

Source: INSSE

Table 86. The natural movement of Constanta County population during 2009-2010

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,09	582	673	-91	207	9	7	ian,10	636	635	1	168	0	3
feb,09	599	593	6	277	67	6	feb,10	641	677	-36	143	99	10
mar,09	637	695	-58	172	85	6	mar,10	705	714	-9	152	83	7
apr,09	684	618	66	243	77	5	apr,10	611	649	-38	343	68	6
mai,09	629	612	17	374	66	5	mai,10	601	629	-28	351	60	7
iun,09	730	609	121	458	57	4	iun,10	745	600	145	223	81	14
iul,09	807	629	178	582	82	10	iul,10	721	599	122	570	99	6
aug,09	847	516	331	736	50	5	aug,10	746	731	15	660	73	5
sept,09	810	559	251	809	73	6	sept,10	743	542	201	720	57	11
oct,09	752	613	139	848	53	9	oct,10	656	637	19	536	56	8
nov,09	644	680	-36	325	51	7	nov,10	694	666	28	206	71	10
dec,09	664	710	-46	231	57	11	dec,10	672	663	9	184	89	13

Source: INSSE

Table 87. The natural movement of Constanta County population during 2011-2012

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,11	594	695	-101	124	2	6	ian,12	583	679	-96	128	23	4
feb,11	582	610	-28	155	94	6	feb,12	543	751	-208	140	98	8
mar,11	618	631	-13	151	138	4	mar,12	590	729	-139	123	71	9
apr,11	511	601	-90	217	128	3	apr,12	530	645	-115	262	85	9
mai,11	524	643	-119	258	100	3	mai,12	647	624	23	268	120	5
iun,11	561	614	-53	407	141	11	iun,12	632	628	4	450	63	10
iul,11	640	674	-34	458	83	9	iul,12	708	659	49	488	72	1
aug,11	735	558	177	609	101	4	aug,12	748	611	137	694	85	4
sept,11	726	585	141	696	99	5	sept,12	663	496	167	723	105	4
oct,11	637	658	-21	483	104	8	oct,12	687	650	37	439	130	9
nov,11	589	700	-111	256	85	4	nov,12	590	592	-2	227	115	4
dec,11	542	721	-179	191	87	11	dec,12	512	717	-205	197	129	6

Source: INSSE

Table 88. The natural movement of Constanta County population during 2013-2014

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,13	641	677	-36	141	37	10	ian,14	575	707	-132	152	52	6
feb,13	461	560	-99	131	136	4	feb,14	605	607	-2	146	102	4
mar,13	495	645	-150	202	114	4	mar,14	542	749	-207	137	103	9
apr,13	573	612	-39	170	133	6	apr,14	592	608	-16	216	89	4
mai,13	531	659	-128	289	131	8	mai,14	574	628	-54	312	110	7
iun,13	549	589	-40	421	90	2	iun,14	588	605	-17	334	117	11
iul,13	702	615	87	425	123	8	iul,14	708	631	77	501	116	8
aug,13	760	582	178	697	95	6	aug,14	689	607	82	795	66	5
sept,13	687	546	141	575	93	3	sept,14	730	635	95	610	134	6
oct,13	623	712	-89	478	110	10	oct,14	602	618	-16	513	118	9
nov,13	557	656	-99	258	89	6	nov,14	544	658	-114	272	104	3
dec,13	534	743	-209	182	60	2	dec,14	588	710	-122	188	136	7

Source: INSSE

Table 89. The population trends of Constanta County during 2007-2014

Year	Population	Year	Population
2007	763144	2011	771444
2008	765703	2012	771458
2009	768296	2013	771785
2010	770028	2014	771506

Source: INSSE

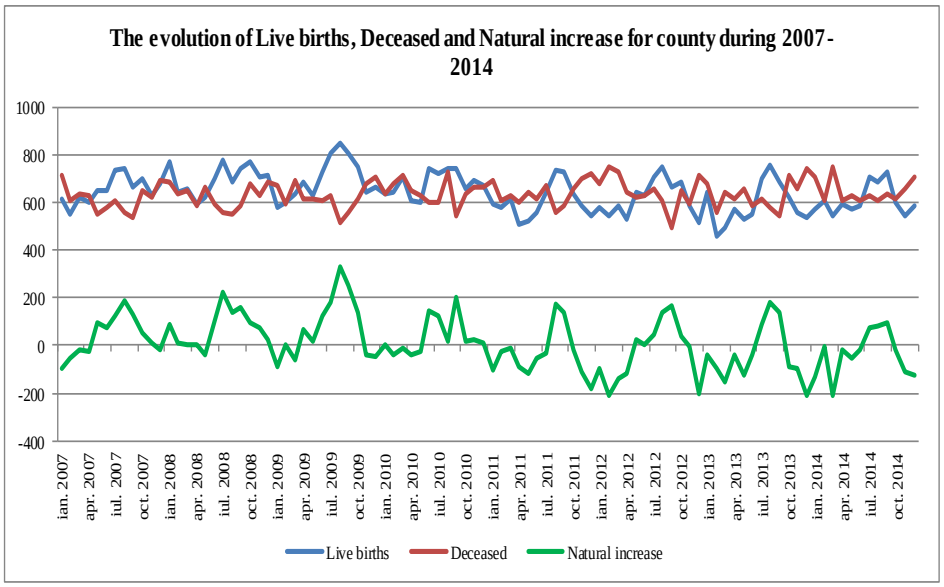


Figure 155

From figure 155 we can see a sinusoidal evolution of the indicator. Except months mai 2007, iun 2007, iul 2007, aug 2007, sept 2007, oct 2007, nov 2007, ian 2008, feb 2008, mar 2008, apr 2008, iun 2008, iul 2008, aug 2008, sept 2008, oct 2008, nov 2008, dec 2008, feb 2009, apr 2009, mai 2009, iun 2009, iul 2009, aug 2009, sept 2009, oct 2009, ian 2010, iun 2010, iul 2010, aug 2010, sept 2010, oct 2010, nov 2010, dec 2010, aug 2011, sept 2011, mai 2012, iun 2012, iul 2012, aug 2012, sept 2012, oct 2012, iul 2013, aug 2013, sept 2013, iul 2014, aug 2014, sept 2014 the natural increase was negative.

Regression analysis relative to indicator "Live births" gives us an equation: y=-1.02244981x+694.9429825 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Deceased" gives us an equation: y=0.29789745x+620.8436404 where x is the number of month (Jan, 2007=1), therefore an upward trend.

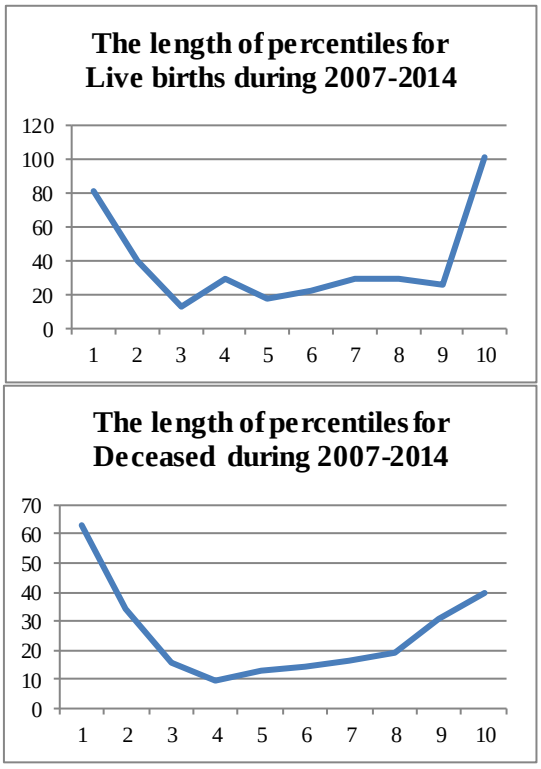
Regression analysis relative to indicator "Natural increase" gives us an equation: y=-1.32034726x+74.09934211 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

For the set of values above, the median indicator for "Live births" is 641, for "Deceased" is 631 and for "Natural increase": -1. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for “Live births”: (461,588.75,640.5,705,847), for “Deceased”: (496,604,631,674.5,751) and for “Natural increase”: (-209,-54.25,-0.5,89,331).

The arithmetic mean and the standard deviation for “Live births” are: (645,79.25), for “Deceased”: (635,54.03) and for “Natural increase”: (10,109.66). This means that with a probability greather than 0.68 “Live births” are in the range [566,724], for “Deceased” in [581,689] and for “Natural increase” in [-100,120].

Percentiles length indicators analysis (Figure 156) show that, indeed the concentration is around the middle of the data.



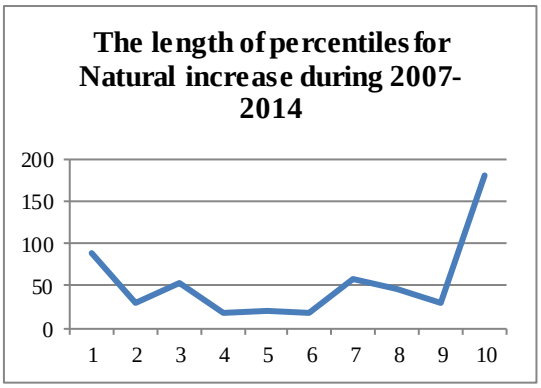


Figure 156

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Live births/10000 inh., Deceased/10000 inh. and Natural increase/10000 inh. as in the figure 157.

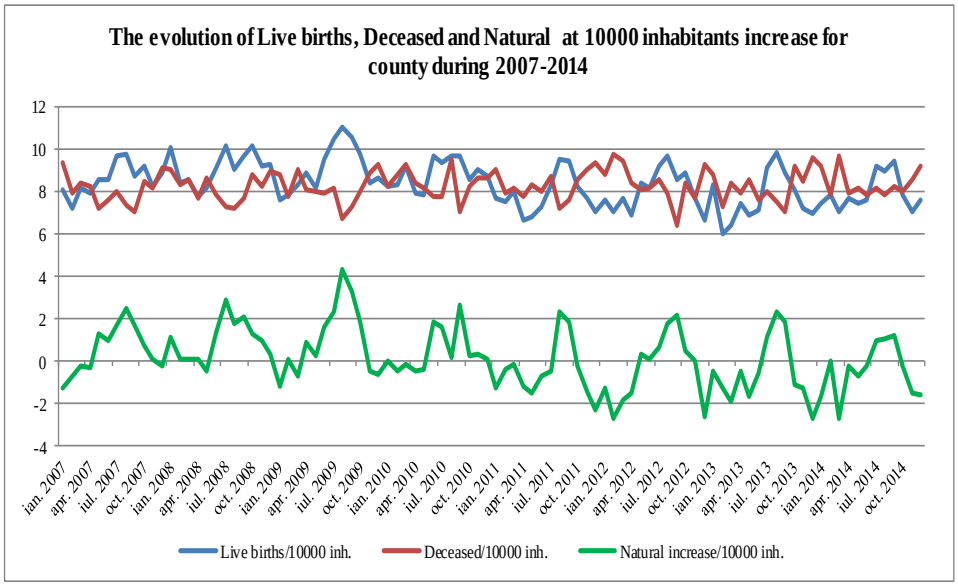


Figure 157

Regression analysis relative to indicator "Live births/10000 inh." gives us an equation: y=-0.014362927x+9.088372807 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Deceased/10000 inh." gives us an equation: y=0.002832813x+8.121879386 where x is the number of month (Jan, 2007=1), therefore a very small upward trend.

Regression analysis relative to indicator “Natural increase/10000 inh.” gives us an equation: y=-0.017199946x+0.966905702 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for “Live births/10000 inh.” is 8, for “Deceased/10000 inh.” is 8 and for “Natural increase/10000 inh.”: 0. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for “Live births/10000 inh.”: (5.97,7.635,8.305,9.18,11.02), for “Deceased/10000 inh.”: (6.43,7.83,8.205,8.7625,9.73) and for “Natural increase/10000 inh.”: (-2.71,-0.705,-0.01,1.155,4.31).

The arithmetic mean and the standard deviation for “Live births/10000 inh.” are: (8,1.04), for “Deceased/10000 inh.”: (8,0.7) and for “Natural increase/10000 inh.”: (0,1.43). This means that with a probability greather than 0.68 “Live births/10000 inh.” are in the range [7,9], for “Deceased/10000 inh.” in [7,9] and for “Natural increase/10000 inh.” in [-1,1].

Percentiles length indicators analysis (Figure 158) show that, indeed the concentration is around the middle of the data.

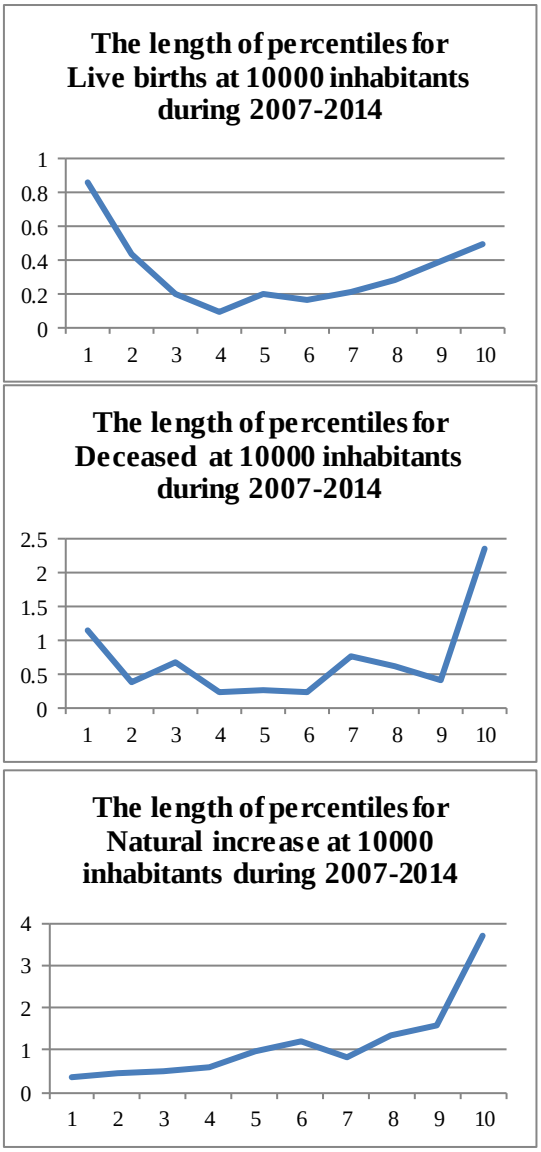


Figure 158

A comparison of the indicator "Live births" with the national level shows that it is better than the national, being better in 90.63% cases. For "Deceased" the indicator is better than the national, being better in 97.92% cases. Finally, for "Natural increase", the indicator is better than the national, being better in 100% cases.

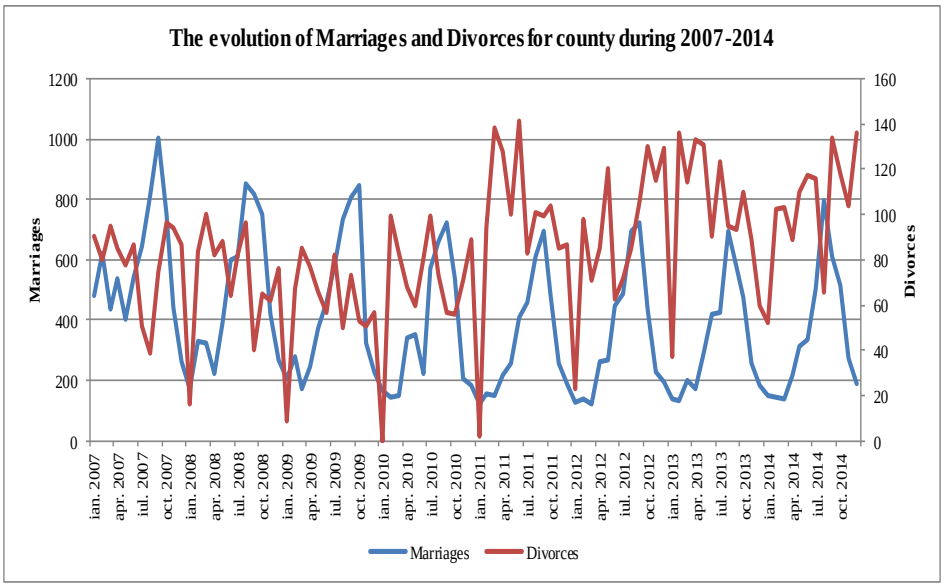


Figure 159

Regression analysis relative to indicator "Marriages" gives us an equation: y=-2.21989962x+508.8734649 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Divorces" gives us an equation: y=0.449925393x+62.45986842 where x is the number of month (Jan, 2007=1), therefore a pronounced upward trend.

For the set of values above, the median indicator for "Marriages" is 347 and for "Divorces" is 85. Also, the distribution of quartiles is for "Marriages": (123,206.75,347,571.25,1004) and for "Divorces": (0,66,85,101.25,141). The arithmetic mean and the standard deviation for "Marriages" are: (401,220.91) and for "Divorces": (84,29.91). This means that with a probability greather than 0.68 "Marriages" are in the range [180,622] and for "Divorces" in [54,114].

Percentiles length indicators analysis (Figure 160) show that, indeed the concentration is around the middle of the data.

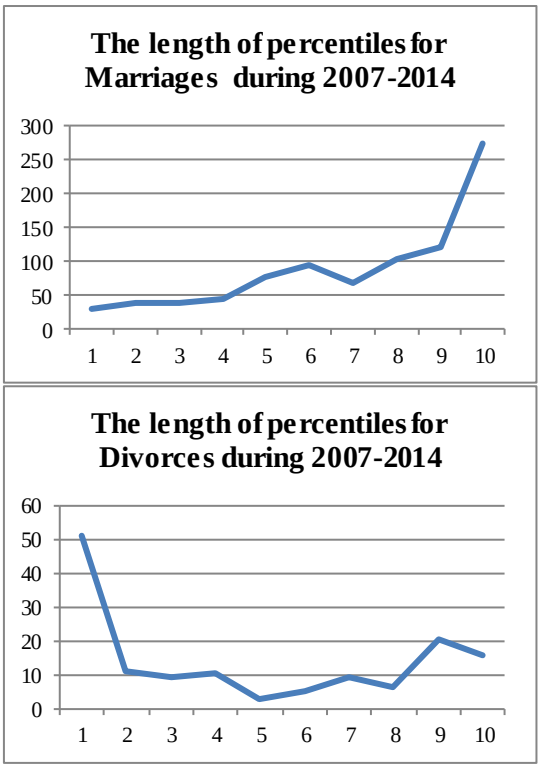


Figure 160

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Marriages/10000 inh. and Divorces/10000 inh. as in the figure 161.

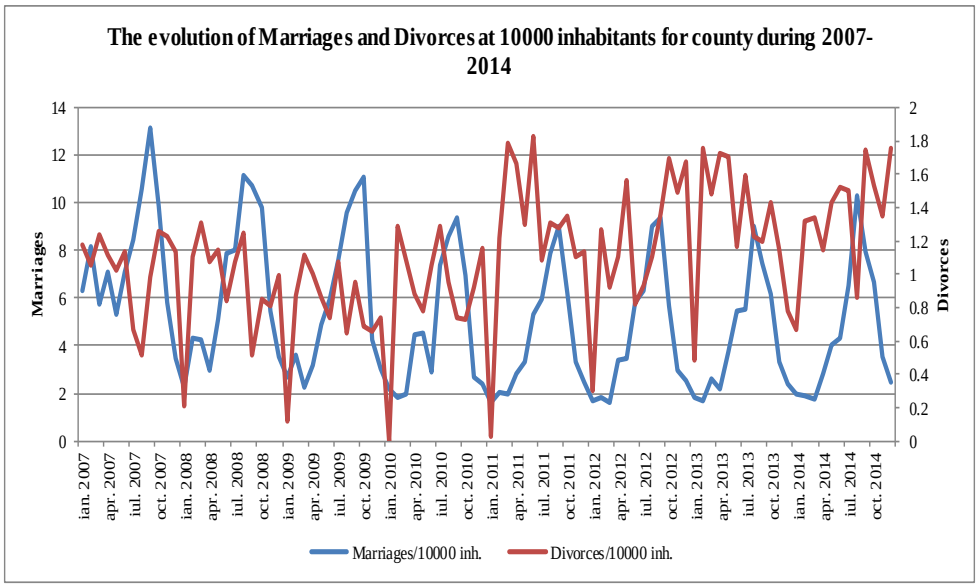


Figure 161

Regression analysis relative to indicator "Marriages/10000 inh." gives us an equation: y=-0.02964589x+6.658346491 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Divorces/10000 inh." gives us an equation: y=0.005715003x+0.818447368 where x is the number of month (Jan, 2007=1), therefore an upward trend.

For the set of values above, the median indicator for "Marriages/10000 inh." is 5 and for "Divorces/10000 inh." is 1. Also, the distribution of quartiles is for "Marriages/10000 inh.": (1.59,2.6875,4.505,7.4125,13.16) and for "Divorces/10000 inh.": (0,0.86,1.11,1.3125,1.83). The arithmetic mean and the standard deviation for "Marriages/10000 inh." are: (5,2.88) and for "Divorces/10000 inh.": (1,0.39). This means that with a probability greather than 0.68 "Marriages/10000 inh." are in the range [2,8] and for "Divorces/10000 inh." in [1,1].

Percentiles length indicators analysis (Figure 162) show that, indeed the concentration is around the middle of the data.

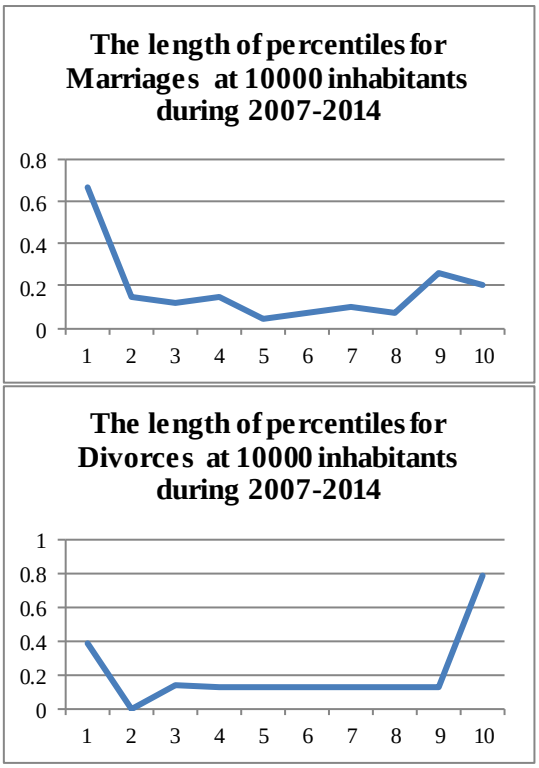


Figure 162

A comparison of the indicator "Marriages" with the national level shows that it is better than the national, being better in 64.58% cases. For "Divorces" the indicator is better than the national, being better in 61.46% cases.

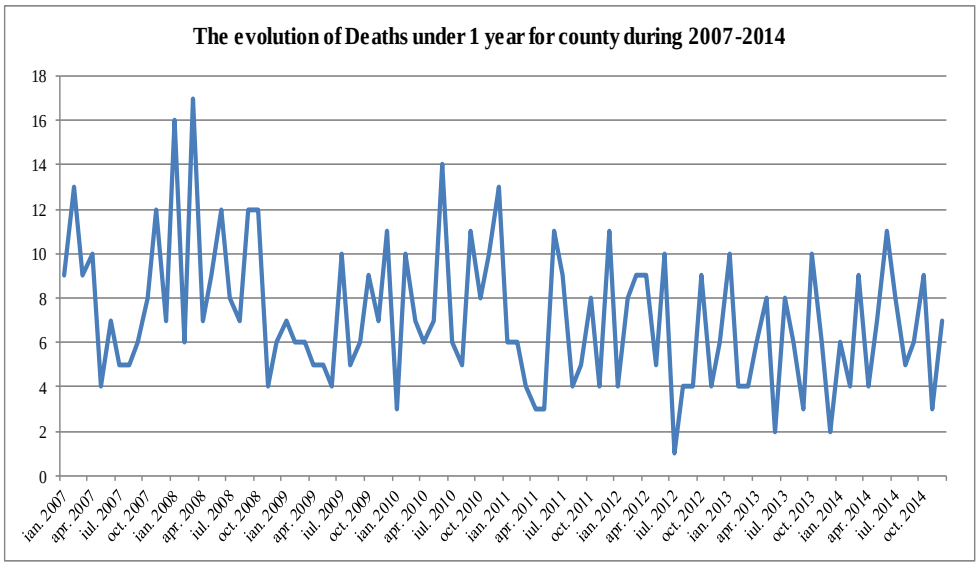


Figure 163

Regression analysis relative to indicator "Deaths under 1 year" gives us an equation: y=-0.032358926x+8.725657895 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Deaths under 1 year" is 7 and the distribution of quartiles is for "Deaths under 1 year": (1,5,7,9,17). The arithmetic mean and the standard deviation for "Deaths under 1 year" are: (7,3.12) which means that with a probability greather than 0.68 "Deaths under 1 year" are in the range [4,10]. Percentiles length indicators analysis (Figure 164) show that, indeed the concentration is around the middle of the data.

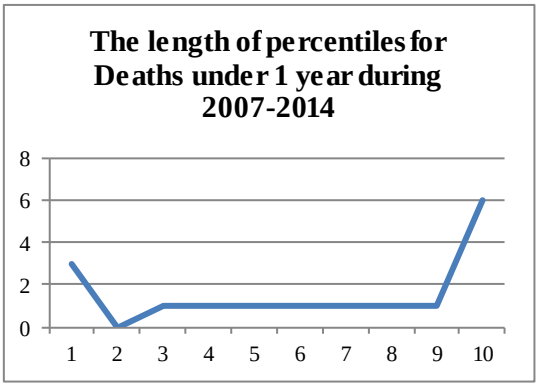


Figure 164

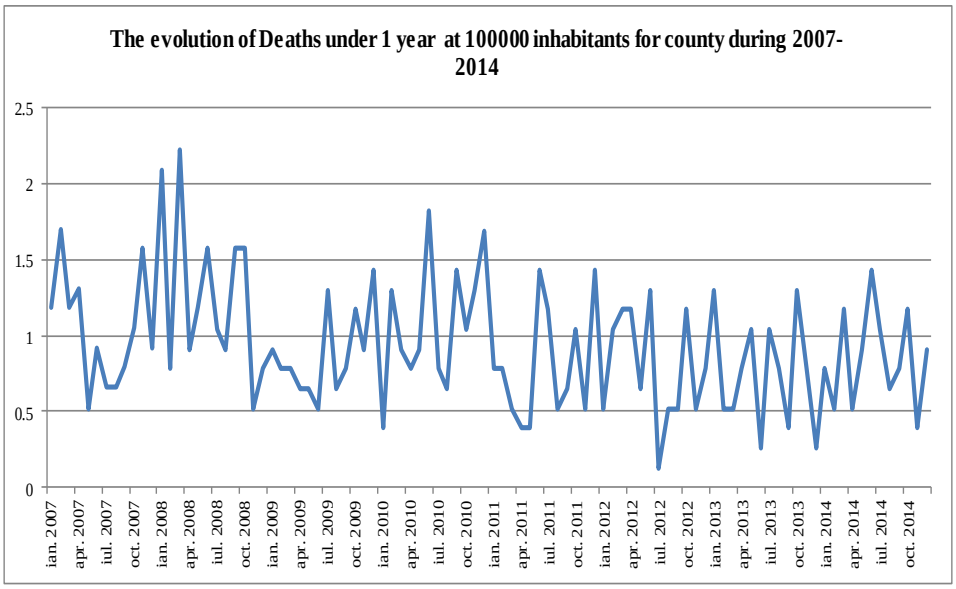


Figure 165

Regression analysis relative to indicator "Deaths under 1 year/100000 inh." gives us an equation: y=-0.004294221x+1.14035307 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Deaths under 1 year/100000 inh." is 1 and the distribution of quartiles is for "Deaths under 1 year/100000 inh.": (0.13,0.65,0.91,1.1725,2.22). The arithmetic mean and the standard deviation for "Deaths under 1 year/100000 inh." are: (1,0.41) which means that with a probability greather than 0.68 "Deaths under 1 year/100000 inh." are in the range [1,1].

A comparison of the indicator "Deaths under 1 year" with the national level shows that it is about the same with the national, being better in 42.71% cases.

A final analysis examines dependence aforementioned indicators of regional GDP variation.

Table 90. The evolution of Constanta County GDP during 2007-2014

Year	GDP (in mil. lei 2007)	Variation (%)
2007	16317	-
2008	16701	2.35
2009	16256	-2.66
2010	16657	2.46

2011	16630	-0.16
2012	19086	14.77
2013	21357	11.9
2014	23053	7.94

Source: INSSE and own calculations

In what follows, we shall investigate if there is a dependency between GDP variation (noted with dGDP) and the aforementioned indicators.

Searching dependence annual variations of "Live births" from GDP, we find that there is a dependence of Live births from GDP offset by 2 years and the regression equation is:0.6566dGDP+-4.6949. Searching dependence annual variations of "Deceased" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Natural increase" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Marriages" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Divorces" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Deaths under 1 year" from GDP, we find that there is not a dependence of the variation of GDP.

2.16. Analysis of natural movement of Covasna County population

Statistics of natural movement corresponding to Covasna County are the following:

Table 91. The natural movement of Covasna County population during 2007-2008

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,07	213	247	-34	239	20	5	ian,08	265	235	30	58	3	1
feb,07	188	164	24	517	34	2	feb,08	227	210	17	85	17	1
mar,07	186	219	-33	255	37	3	mar,08	193	215	-22	88	34	1
apr,07	203	202	1	116	39	1	apr,08	186	217	-31	79	18	1
mai,07	208	209	-1	163	29	4	mai,08	232	192	40	130	62	2
iun,07	212	200	12	124	33	1	iun,08	201	204	-3	108	12	4
iul,07	218	179	39	192	6	4	iul,08	260	189	71	157	51	2
aug,07	209	196	13	205	12	4	aug,08	206	193	13	187	10	1
sept,07	178	181	-3	170	19	3	sept,08	227	207	20	146	5	1
oct,07	216	216	0	160	50	2	oct,08	211	212	-1	115	15	1
nov,07	206	216	-10	115	48	3	nov,08	172	216	-44	92	31	2
dec,07	197	238	-41	110	27	1	dec,08	189	230	-41	67	22	3

Source: INSSE

Table 92. The natural movement of Covasna County population during 2009-2010

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,09	252	231	21	41	5	2	ian,10	207	235	-28	31	0	3
feb,09	205	188	17	88	33	0	feb,10	210	218	-8	63	31	4
mar,09	215	237	-22	65	24	0	mar,10	219	210	9	77	43	2
apr,09	203	225	-22	79	31	1	apr,10	227	219	8	81	29	1
mai,09	172	194	-22	127	32	1	mai,10	187	211	-24	137	13	1
iun,09	193	192	1	94	25	3	iun,10	243	170	73	73	45	1
iul,09	199	207	-8	153	30	1	iul,10	197	194	3	153	21	4
aug,09	239	195	44	206	11	3	aug,10	238	212	26	153	0	2
sept,09	227	215	12	149	5	2	sept,10	195	178	17	120	34	0
oct,09	200	223	-23	127	19	7	oct,10	160	197	-37	81	16	5
nov,09	174	204	-30	88	15	3	nov,10	183	228	-45	46	24	3
dec,09	191	250	-59	70	23	4	dec,10	202	250	-48	48	31	4

Source: INSSE

Table 93. The natural movement of Covasna County population during 2011-2012

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,11	204	215	-11	28	2	4	ian,12	196	219	-23	34	0	6
feb,11	177	196	-19	49	31	1	feb,12	190	225	-35	29	26	3
mar,11	199	228	-29	35	35	1	mar,12	150	228	-78	32	34	2
apr,11	175	204	-29	63	19	0	apr,12	184	204	-23	54	28	2
mai,11	166	198	-32	94	35	3	mai,12	231	209	22	79	23	4
iun,11	181	176	5	76	17	1	iun,12	182	168	14	68	18	2
iul,11	211	185	26	112	21	2	iul,12	235	214	21	111	33	0
aug,11	219	208	11	147	1	1	aug,12	246	204	42	165	28	3
sept,11	210	184	26	90	5	1	sept,12	188	191	-3	111	11	2
oct,11	185	205	-20	71	8	1	oct,12	224	176	48	75	30	2
nov,11	197	218	-21	58	42	3	nov,12	188	210	-22	60	44	2
dec,11	160	195	-35	37	40	2	dec,12	169	230	-61	45	25	2

Source: INSSE

Table 94. The natural movement of Covasna County population during 2013-2014

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,13	207	216	-9	32	7	2	ian,14	225	206	19	39	2	4
feb,13	192	187	5	41	25	2	feb,14	156	241	-85	48	10	2
mar,13	202	204	-2	44	23	4	mar,14	171	211	-40	34	21	0
apr,13	217	213	4	65	27	4	apr,14	189	236	-47	65	8	2
mai,13	156	193	-37	105	34	2	mai,14	153	200	-47	118	12	2
iun,13	196	159	37	88	6	0	iun,14	185	185	0	99	12	1
iul,13	221	188	33	123	4	0	iul,14	243	211	32	141	3	2
aug,13	206	171	35	183	21	1	aug,14	192	182	10	171	17	1
sept,13	199	199	0	118	17	2	sept,14	216	185	31	115	11	3
oct,13	214	213	1	88	7	3	oct,14	191	208	-17	78	8	1
nov,13	161	203	-43	55	16	4	nov,14	182	196	-14	60	17	1
dec,13	179	238	-59	40	14	3	dec,14	160	229	-69	48	19	1

Source: INSSE

Table 95. The population trends of Covasna County during 2007-2014

Year	Population	Year	Population
2007	232559	2011	231521
2008	232408	2012	230907
2009	232251	2013	230392
2010	232052	2014	229958

Source: INSSE

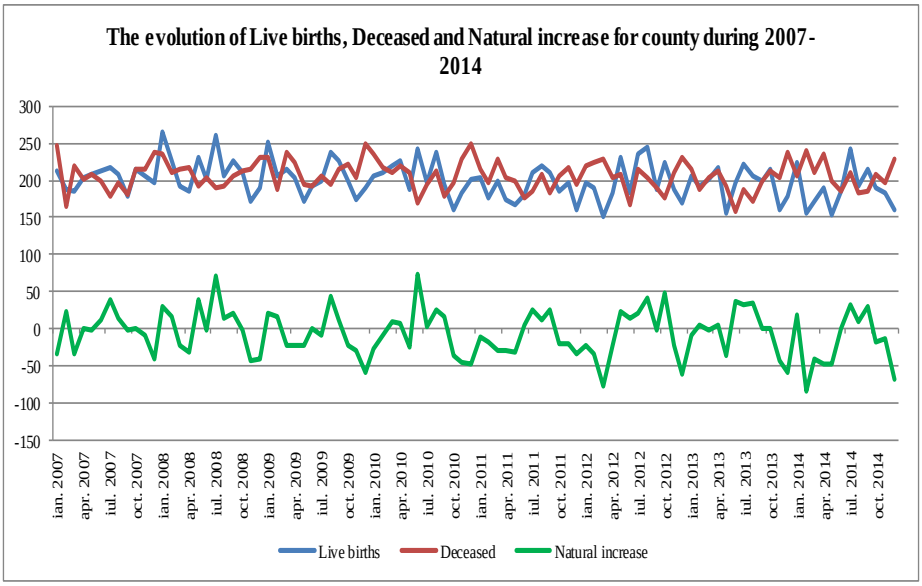


Figure 166

From figure 166 we can see a sinusoidal evolution of the indicator. Except months feb 2007, apr 2007, iun 2007, iul 2007, aug 2007, oct 2007, ian 2008, feb 2008, mai 2008, iul 2008, aug 2008, sept 2008, ian 2009, feb 2009, iun 2009, aug 2009, sept 2009, mar 2010, apr 2010, iun 2010, iul 2010, aug 2010, sept 2010, iun 2011, iul 2011, aug 2011, sept 2011, mai 2012, iun 2012, iul 2012, aug 2012, oct 2012, feb 2013, apr 2013, iun 2013, iul 2013, aug 2013, sept 2013, oct 2013, ian 2014, iun 2014, iul 2014, aug 2014, sept 2014 the natural increase was negative.

Regression analysis relative to indicator “Live births” gives us an equation: y=-0.240375746x+211.8769737 where x is the number of month (Jan, 2007=1), therefore a downward trend.

Regression analysis relative to indicator “Deceased” gives us an equation: y=-0.074593055x+210.2219298 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

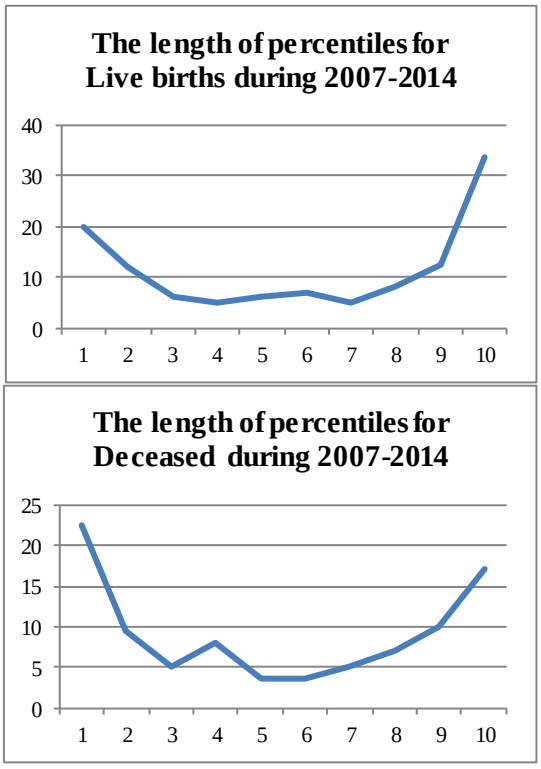
Regression analysis relative to indicator “Natural increase” gives us an equation: y=-0.166881443x+1.666666667 where x is the number of month (Jan, 2007=1), therefore a downward trend.

For the set of values above, the median indicator for “Live births” is 199, for “Deceased” is 208 and for “Natural increase”: -3. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for “Live births”: (150,185,199,215.25,265), for “Deceased”: (159,193.75,207.5,218,250) and for “Natural increase”: (-85,-29.25,-3,17,73).

The arithmetic mean and the standard deviation for “Live births” are: (200,24.26), for “Deceased”: (207,19.55) and for “Natural increase”: (-6,31.41). This means that with a probability greather than 0.68 “Live births” are in the range [176,224], for “Deceased” in [187,227] and for “Natural increase” in [-37,25].

Percentiles length indicators analysis (Figure 167) show that, indeed the concentration is around the middle of the data.



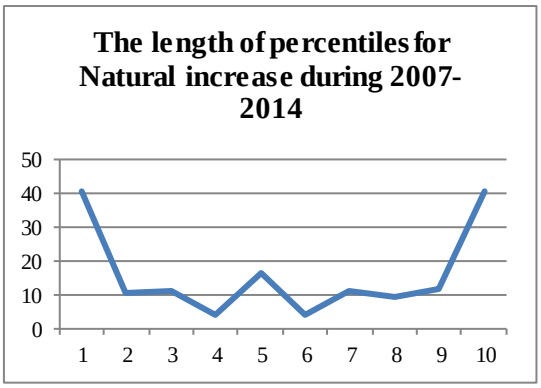


Figure 167

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Live births/10000 inh., Deceased/10000 inh. and Natural increase/10000 inh. as in the figure 168.

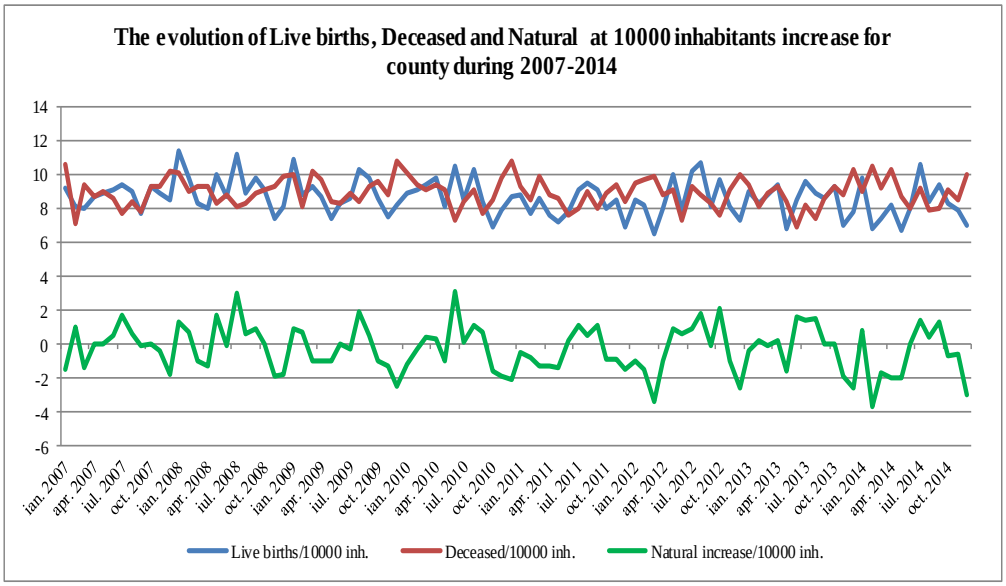


Figure 168

Regression analysis relative to indicator "Live births/10000 inh." gives us an equation: y=-0.009193028x+9.093361842 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Deceased/10000 inh." gives us an equation: y=-0.001993014x+9.020723684 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator “Natural increase/10000 inh.” gives us an equation: y=-0.007257868x+0.073673246 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for “Live births/10000 inh.” is 9, for “Deceased/10000 inh.” is 9 and for “Natural increase/10000 inh.”: 0. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for “Live births/10000 inh.”: (6.5,7.9975,8.605,9.29,11.4), for “Deceased/10000 inh.”: (6.9,8.3575,8.97,9.3975,10.77) and for “Natural increase/10000 inh.”: (-3.7,-1.26,-0.13,0.73,3.15).

The arithmetic mean and the standard deviation for “Live births/10000 inh.” are: (9,1.04), for “Deceased/10000 inh.”: (9,0.84) and for “Natural increase/10000 inh.”: (0,1.36). This means that with a probability greather than 0.68 “Live births/10000 inh.” are in the range [8,10], for “Deceased/10000 inh.” in [8,10] and for “Natural increase/10000 inh.” in [-1,1].

Percentiles length indicators analysis (Figure 169) show that, indeed the concentration is around the middle of the data.

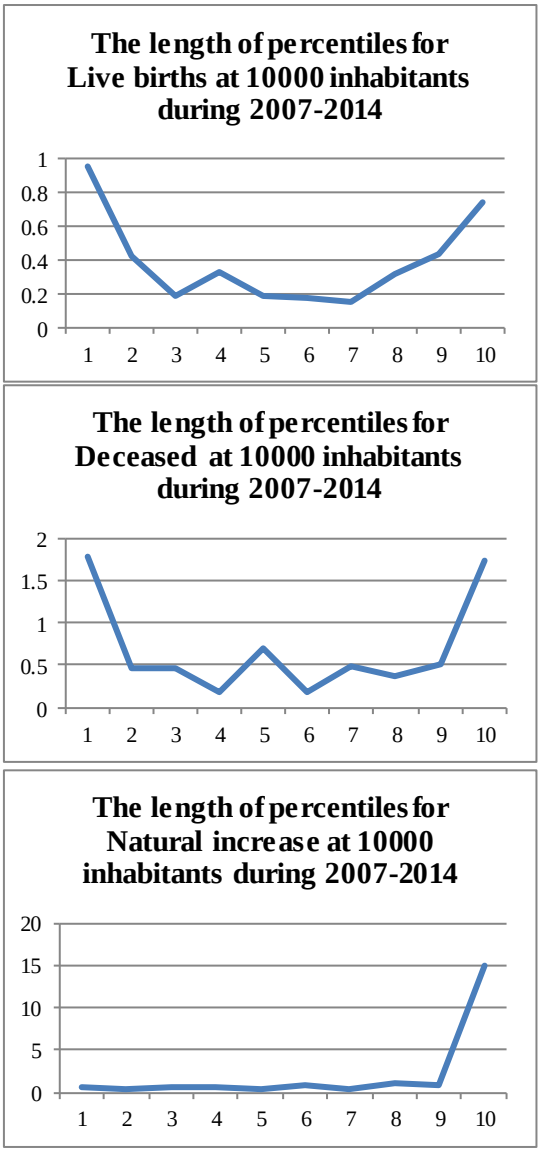


Figure 169

A comparison of the indicator "Live births" with the national level shows that it is better than the national, being better in 88.54% cases. For "Deceased" the indicator is better than the national, being better in 77.08% cases. Finally, for "Natural increase", the indicator is better than the national, being better in 89.58% cases.

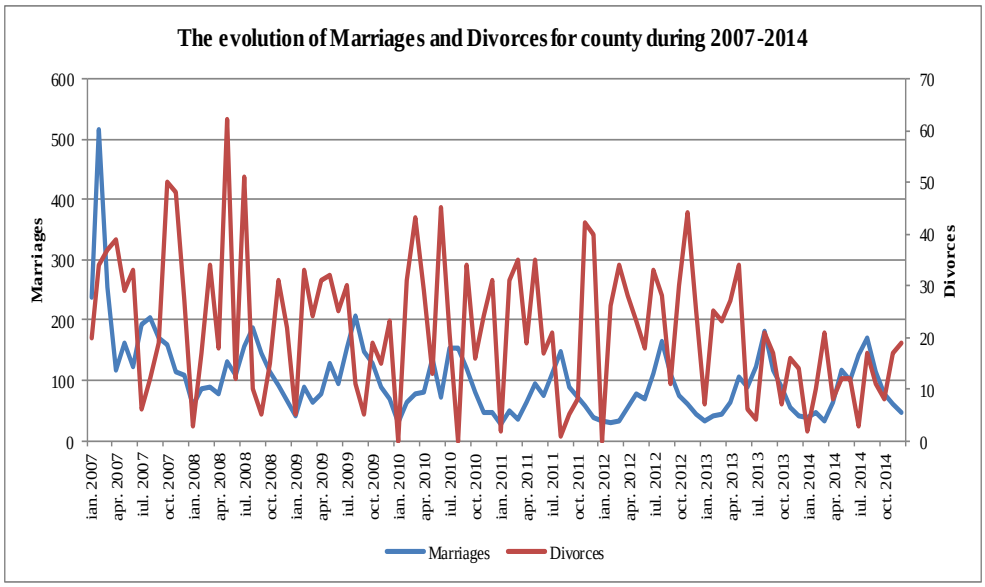


Figure 170

Regression analysis relative to indicator "Marriages" gives us an equation: y=-1.013137547x+150.6892544 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Divorces" gives us an equation: y=-0.141813619x+28.45087719 where x is the number of month (Jan, 2007=1), therefore a downward trend.

For the set of values above, the median indicator for "Marriages" is 88 and for "Divorces" is 21. Also, the distribution of quartiles is for "Marriages": (28,59.5,88,127,517) and for "Divorces": (0,11,21,31,62). The arithmetic mean and the standard deviation for "Marriages" are: (102,65.66) and for "Divorces": (22,13.27). This means that with a probability greather than 0.68 "Marriages" are in the range [36,168] and for "Divorces" in [9,35].

Percentiles length indicators analysis (Figure 171) show that, indeed the concentration is around the middle of the data.

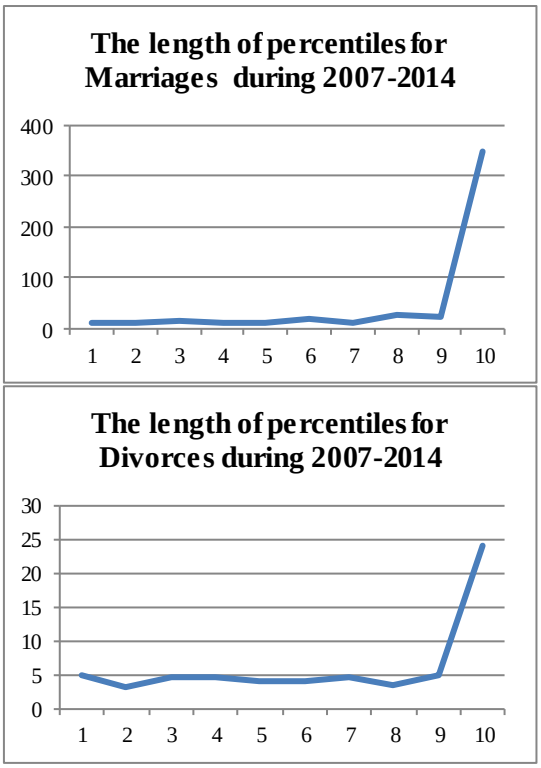


Figure 171

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Marriages/10000 inh. and Divorces/10000 inh. as in the figure 172.

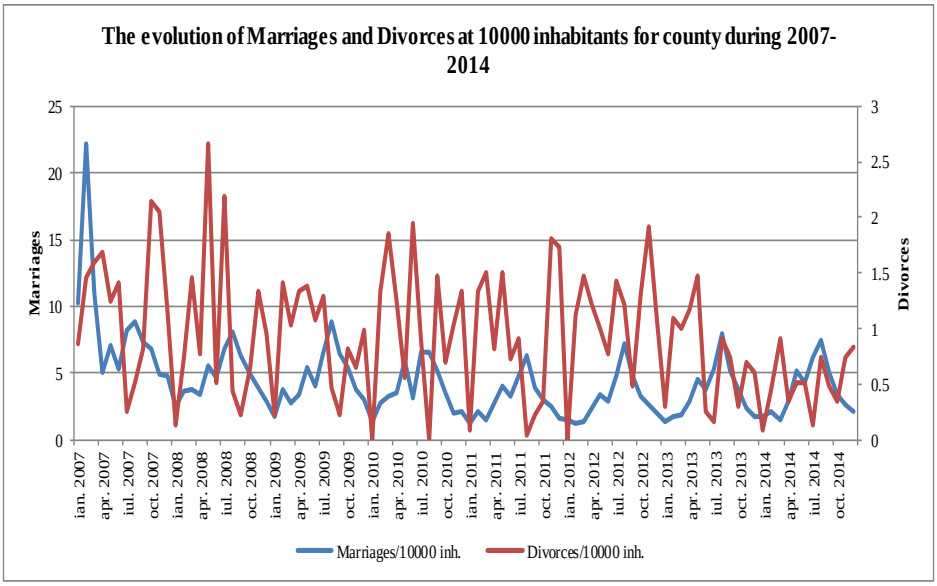


Figure 172

Regression analysis relative to indicator "Marriages/10000 inh." gives us an equation: y=-0.043062466x+6.471967105 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Divorces/10000 inh." gives us an equation: y=-0.006011937x+1.223037281 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Marriages/10000 inh." is 4 and for "Divorces/10000 inh." is 1. Also, the distribution of quartiles is for "Marriages/10000 inh.": (1.21,2.5775,3.79,5.47,22.23) and for "Divorces/10000 inh.": (0,0.48,0.905,1.34,2.67). The arithmetic mean and the standard deviation for "Marriages/10000 inh." are: (4,2.82) and for "Divorces/10000 inh.": (1,0.57). This means that with a probability greather than 0.68 "Marriages/10000 inh." are in the range [1,7] and for "Divorces/10000 inh." in [0,2].

Percentiles length indicators analysis (Figure 173) show that, indeed the concentration is around the middle of the data.

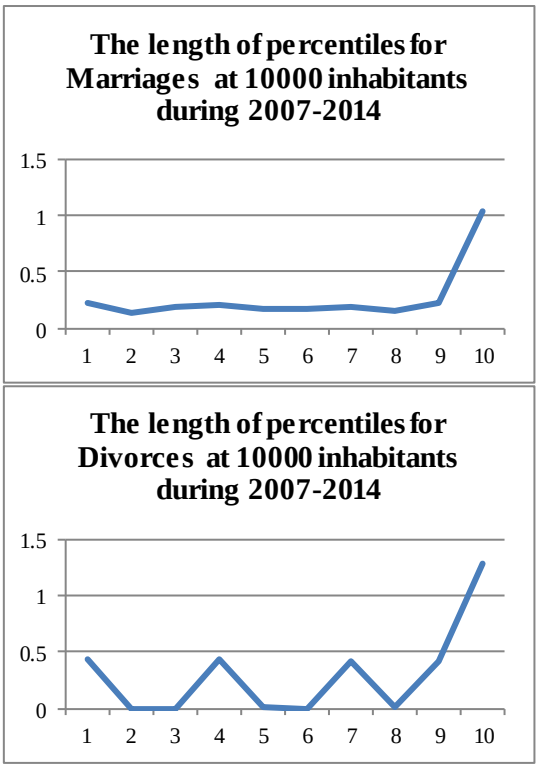


Figure 173

A comparison of the indicator "Marriages" with the national level shows that it is worse than the national, being better only in 35.42% cases. For "Divorces" the indicator is better than the national, being better in 70.83% cases.

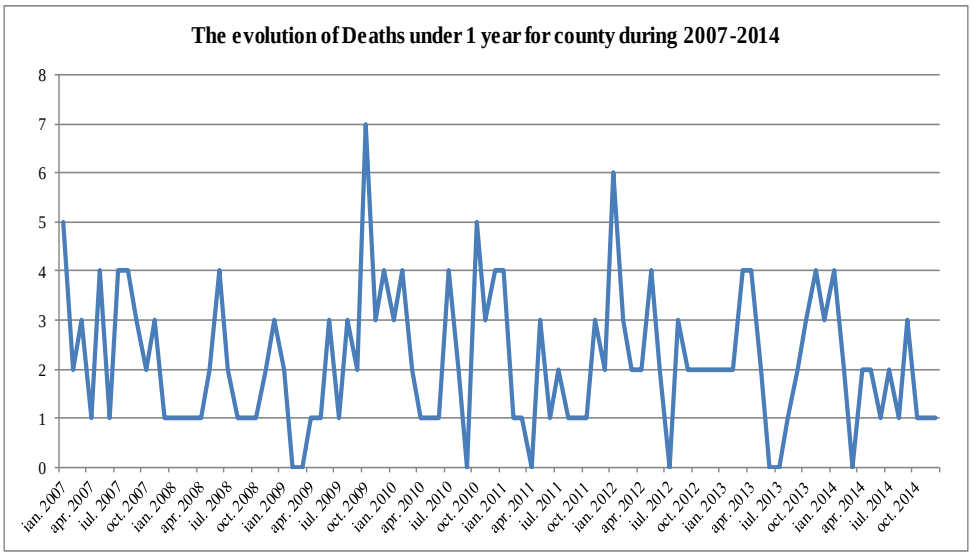


Figure 174

Regression analysis relative to indicator "Deaths under 1 year" gives us an equation: y=-0.004347531x+2.367105263 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Deaths under 1 year" is 2 and the distribution of quartiles is for "Deaths under 1 year": (0,1,2,3,7). The arithmetic mean and the standard deviation for "Deaths under 1 year" are: (2,1.4) which means that with a probability greather than 0.68 "Deaths under 1 year" are in the range [1,3].

Percentiles length indicators analysis (Figure 175) show that, indeed the concentration is around the middle of the data.

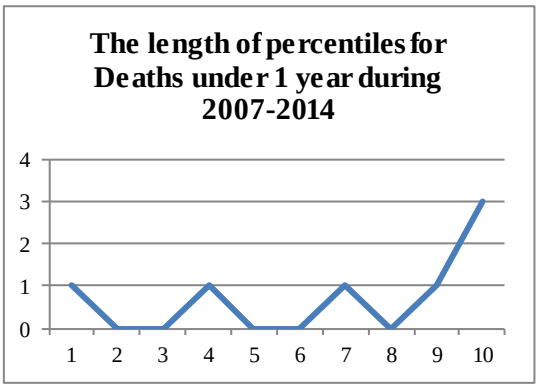


Figure 175

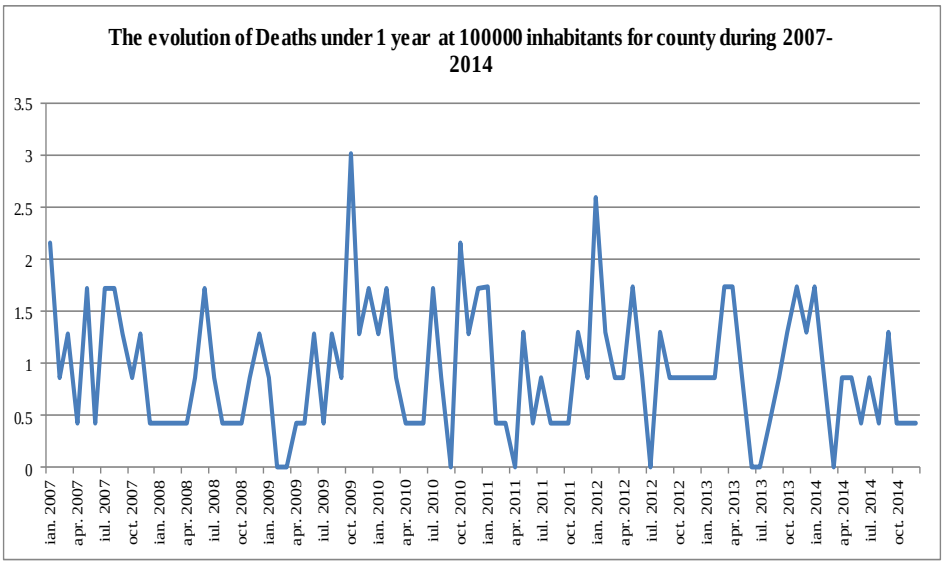


Figure 176

Regression analysis relative to indicator "Deaths under 1 year/100000 inh." gives us an equation: y=-0.001752781x+1.015739035 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Deaths under 1 year/100000 inh." is 1 and the distribution of quartiles is for "Deaths under 1 year/100000 inh.": (0,0.43,0.87,1.3,3.01). The arithmetic mean and the standard deviation for "Deaths under 1 year/100000 inh." are: (1,0.61) which means that with a probability greather than 0.68 "Deaths under 1 year/100000 inh." are in the range [0,2]. A comparison of the indicator "Deaths under 1 year" with the national level shows that it is about the same with the national, being better in 41.67% cases. A final analysis examines dependence aforementioned indicators of regional GDP variation.

Table 96. The evolution of Covasna County GDP during 2007-2014

Year	GDP (in mil. lei 2007)	Variation (%)
2007	3442	-
2008	3492	1.45
2009	3349	-4.1
2010	3038	-9.28
2011	3209	5.61
2012	3110	-3.09
2013	3218	3.49
2014	3212	-0.18

Source: INSSE and own calculations

In what follows, we shall investigate if there is a dependency between GDP variation (noted with dGDP) and the aforementioned indicators.

Searching dependence annual variations of "Live births" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Deceased" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Natural increase" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Marriages" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Divorces" from GDP, we find that there is a dependence of Divorces from GDP in the current year and the regression equation is: -2.6379dGDP+-12.8787. Searching dependence annual variations of "Deaths under 1 year" from GDP, we find that there is a dependence of Deaths under 1 year from GDP in the current year and the regression equation is: -4.4875dGDP+-5.702.

2.17. Analysis of Natural Movement of Dambovita County Population

Statistics of natural movement corresponding to Dambovita County are the following:

Table 97. The natural movement of Dambovita County population during 2007-2008

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,07	423	674	-251	228	79	4	ian,08	457	650	-193	111	77	3
feb,07	384	487	-103	568	85	5	feb,08	397	573	-176	143	97	6
mar,07	382	528	-146	294	71	0	mar,08	429	531	-102	158	59	5
apr,07	396	511	-115	312	77	3	apr,08	379	530	-151	102	94	4
mai,07	386	572	-186	345	89	2	mai,08	426	516	-90	270	88	5
iun,07	437	424	13	409	64	3	iun,08	401	506	-105	333	22	2
iul,07	466	489	-23	544	48	3	iul,08	482	524	-42	472	40	1
aug,07	424	456	-32	676	76	7	aug,08	458	435	23	780	72	5
sept,07	420	427	-7	601	35	3	sept,08	483	490	-7	477	47	5
oct,07	423	535	-112	351	51	5	oct,08	489	538	-49	307	66	7
nov,07	378	532	-154	204	71	1	nov,08	365	497	-132	203	79	6
dec,07	362	579	-217	158	87	3	dec,08	493	576	-83	115	98	6

Source: INSSE

Table 98. The natural movement of Dambovita County population during 2009-2010

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,09	426	617	-191	110	20	9	ian,10	398	548	-150	114	37	3
feb,09	383	526	-143	145	145	1	feb,10	398	598	-200	93	40	3
mar,09	394	621	-227	88	62	4	mar,10	419	599	-180	74	143	9
apr,09	398	553	-155	125	34	6	apr,10	410	556	-146	200	71	1
mai,09	409	506	-97	262	142	7	mai,10	359	535	-176	241	78	3
iun,09	442	438	4	268	37	7	iun,10	482	491	-9	135	63	4
iul,09	543	472	71	461	119	9	iul,10	427	505	-78	498	95	2
aug,09	529	454	75	625	65	3	aug,10	525	492	33	537	96	1
sept,09	556	461	95	456	44	6	sept,10	478	448	30	375	36	5
oct,09	461	522	-61	333	15	5	oct,10	445	513	-68	262	22	1
nov,09	430	546	-116	152	37	5	nov,10	470	548	-78	103	21	2
dec,09	407	627	-220	95	29	6	dec,10	417	586	-169	75	64	8

Source: INSSE

Table 99. The natural movement of Dambovita County population during 2011-2012

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,11	379	606	-227	82	43	5	ian,12	349	591	-242	72	24	6
feb,11	387	523	-136	97	79	4	feb,12	385	643	-258	94	107	3
mar,11	377	581	-204	57	125	3	mar,12	324	578	-254	61	46	1
apr,11	306	556	-250	98	107	1	apr,12	372	519	-147	116	58	4
mai,11	378	495	-117	142	86	4	mai,12	420	460	-40	156	72	2
iun,11	398	459	-61	225	60	2	iun,12	357	475	-118	218	54	0
iul,11	403	447	-44	399	127	5	iul,12	450	499	-49	397	18	1
aug,11	493	441	52	485	55	0	aug,12	484	486	-2	527	67	0
sept,11	425	431	-6	356	27	1	sept,12	431	406	25	408	54	1
oct,11	360	495	-135	214	36	3	oct,12	430	543	-113	194	46	3
nov,11	416	477	-61	82	75	5	nov,12	369	524	-155	100	29	6
dec,11	412	586	-174	55	59	4	dec,12	341	541	-200	77	73	5

Source: INSSE

Table 100. The natural movement of Dambovita County population during 2013-2014

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,13	430	586	-156	58	20	2	ian,14	387	534	-147	69	15	4
feb,13	342	479	-137	95	97	3	feb,14	324	546	-222	71	37	0
mar,13	313	612	-299	97	53	3	mar,14	336	598	-262	100	27	4
apr,13	326	601	-275	51	26	4	apr,14	381	549	-168	108	49	0
mai,13	299	547	-248	164	91	3	mai,14	337	532	-195	184	52	3
iun,13	369	502	-133	261	20	2	iun,14	346	454	-108	185	32	1
iul,13	444	430	14	370	14	3	iul,14	458	436	22	376	61	1
aug,13	467	477	-10	508	97	3	aug,14	454	492	-38	590	25	6
sept,13	430	473	-43	365	39	2	sept,14	433	443	-10	307	47	4
oct,13	384	539	-155	224	37	1	oct,14	376	557	-181	229	41	1
nov,13	355	525	-170	114	47	2	nov,14	317	495	-178	125	61	4
dec,13	325	572	-247	79	87	3	dec,14	343	606	-263	71	55	5

Source: INSSE

Table 101. The population trends of Dambovita County during 2007-2014

Year	Population	Year	Population
2007	540137	2011	537416
2008	538712	2012	536430
2009	538404	2013	535442
2010	537994	2014	533057

Source: INSSE

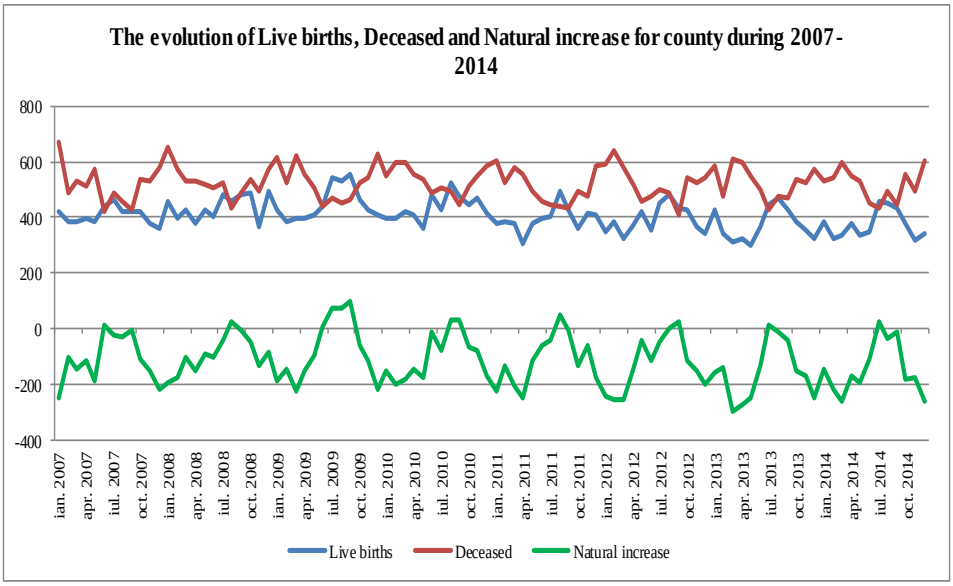


Figure 177

From figure 177 we can see a sinusoidal evolution of the indicator. Except months iun. 2007, aug. 2008, iun. 2009, iul. 2009, aug. 2009, sept. 2009, aug. 2010, sept. 2010, aug. 2011, sept. 2012, iul. 2013, iul. 2014 the natural increase was negative.

Regression analysis relative to indicator "Live births" gives us an equation: y=-0.683125339x+441.1315789 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Deceased" gives us an equation: y=-0.117342648x+529.5348684 where x is the number of month (Jan, 2007=1), therefore a downward trend.

Regression analysis relative to indicator "Natural increase" gives us an equation: y=-0.565782691x+-88.40328947 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

For the set of values above, the median indicator for "Live births" is 405, for "Deceased" is 525 and for "Natural increase": -133. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births": (299,375,405,438.25,556), for "Deceased": (406,484.25,524.5,560.75,674) and for "Natural increase": (-299,-180.25,-132.5,-42.75,95).

The arithmetic mean and the standard deviation for "Live births" are: (408,54.02), for "Deceased": (524,57.98) and for "Natural increase": (-116,92.56). This means that with a probability greather than 0.68 "Live births" are in the range [354,462], for "Deceased" in [466,582] and for "Natural increase" in [-209,-23].

Percentiles length indicators analysis (Figure 178) show that, indeed the concentration is around the middle of the data.

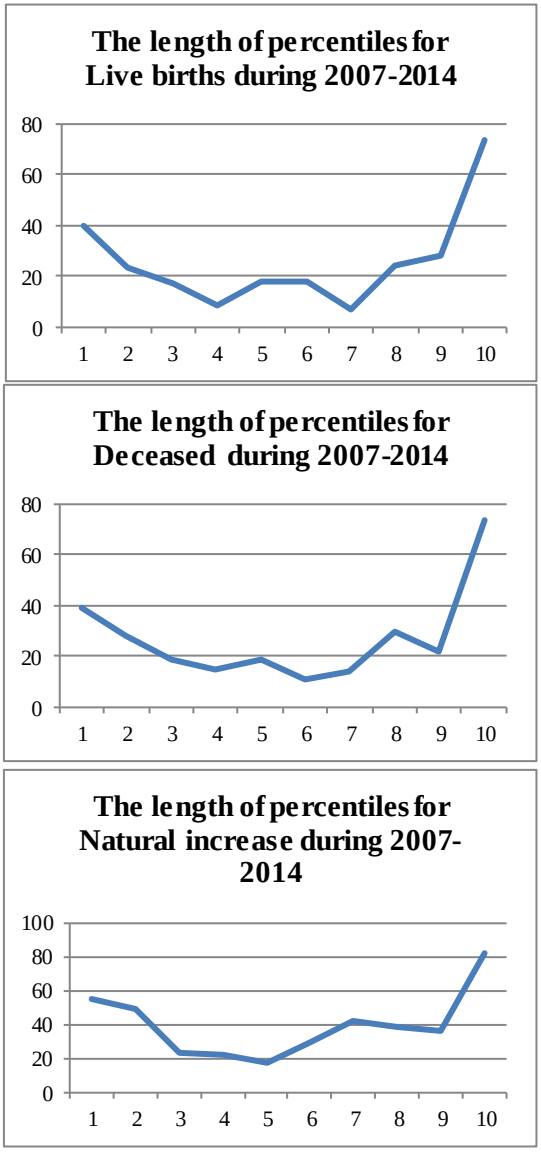


Figure 178

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Live births/10000 inh., Deceased/10000 inh. and Natural increase/10000 inh. as in the figure 179.

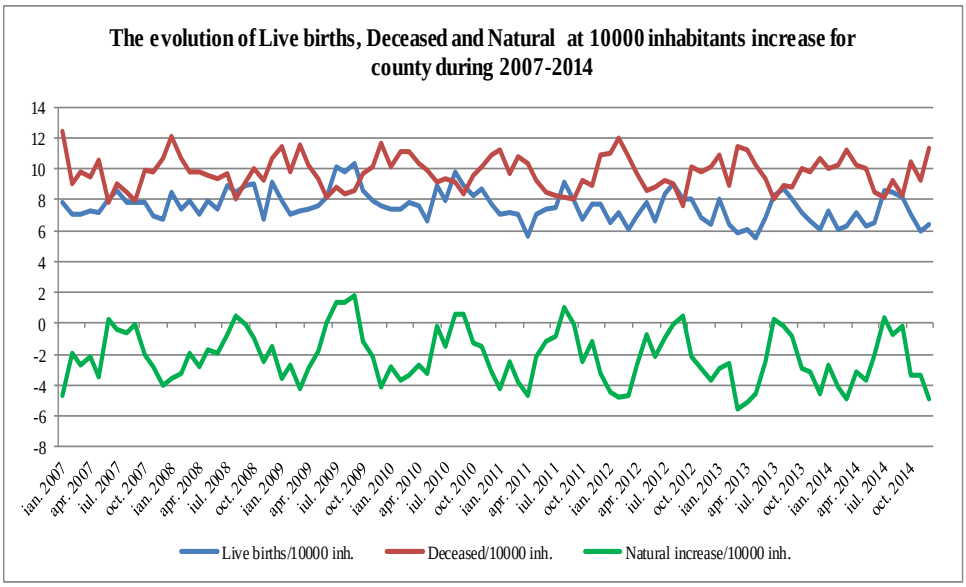


Figure 179

Regression analysis relative to indicator "Live births/10000 inh." gives us an equation: y=-0.011759631x+8.164300439 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Deceased/10000 inh." gives us an equation: y=-0.000907895x+9.796324561 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Natural increase/10000 inh." gives us an equation: y=-0.010844208x+-1.632076754 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Live births/10000 inh." is 8, for "Deceased/10000 inh." is 10 and for "Natural increase/10000 inh.": -2. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births/10000 inh.": (5.58,6.9825,7.53,8.1425,10.33), for "Deceased/10000 inh.": (7.57,9.0025,9.77,10.485,12.48) and for "Natural increase/10000 inh.": (-5.58,-3.3625,-2.465,-0.795,1.76).

The arithmetic mean and the standard deviation for "Live births/10000 inh." are: (8,1), for "Deceased/10000 inh.": (10,1.08) and for "Natural increase/10000 inh.": (-2,1.73). This means that with a probability greather than 0.68 "Live births/10000 inh." are in the range [7,9], for "Deceased/10000 inh." in [9,11] and for "Natural increase/10000 inh." in [-4,0].

Percentiles length indicators analysis (Figure 180) show that, indeed the concentration is around the middle of the data.

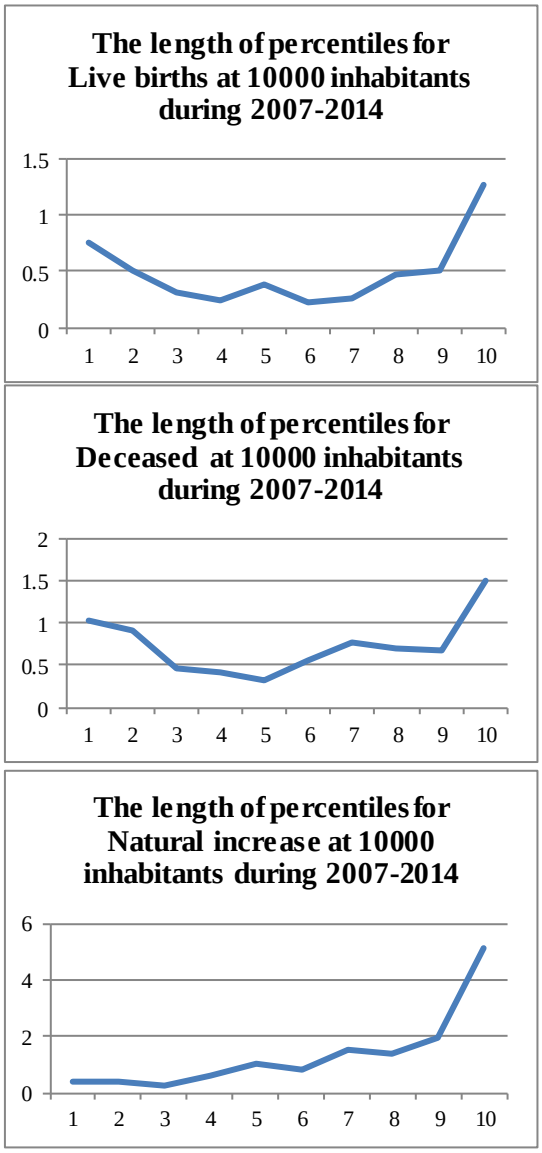


Figure 180

A comparison of the indicator "Live births" with the national level shows that it is about the same with the national, being better in 44.79% cases. For "Deceased" the indicator is worse than the national, being better only in 27.08% cases. Finally, for

"Natural increase", the indicator is worse than the national, being better only in 30.21% cases.

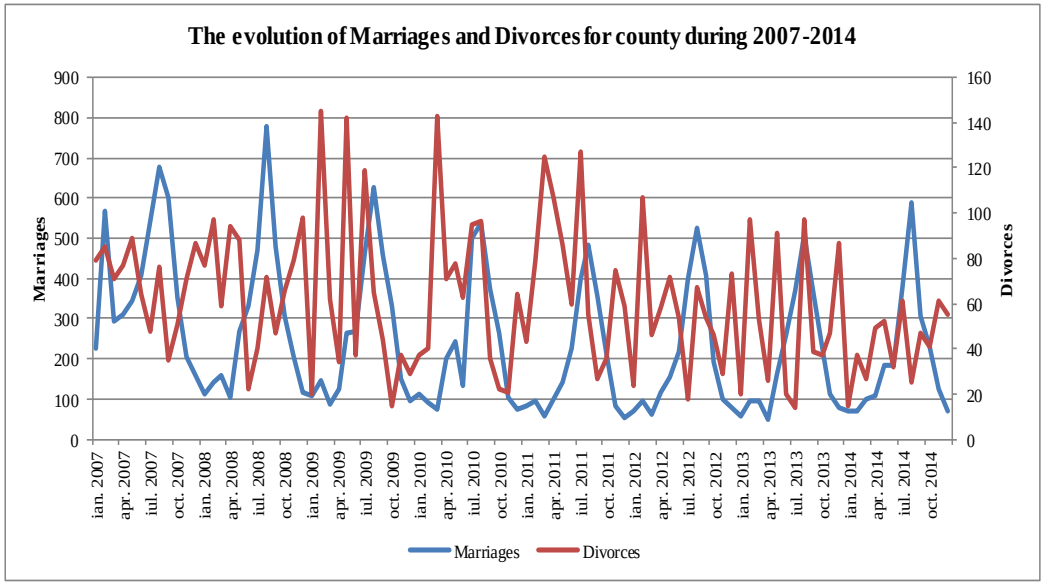


Figure 181

Regression analysis relative to indicator "Marriages" gives us an equation: y=-1.762486435x+330.2826754 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Divorces" gives us an equation: y=-0.309576777x+75.88947368 where x is the number of month (Jan, 2007=1), therefore a downward trend.

For the set of values above, the median indicator for "Marriages" is 197 and for "Divorces" is 59. Also, the distribution of quartiles is for "Marriages": (51,100,197,358.25,780) and for "Divorces": (14,37,58.5,79,145). The arithmetic mean and the standard deviation for "Marriages" are: (245,171.38) and for "Divorces": (61,30.59). This means that with a probability greather than 0.68 "Marriages" are in the range [74,416] and for "Divorces" in [30,92].

Percentiles length indicators analysis (Figure 182) show that, indeed the concentration is around the middle of the data.

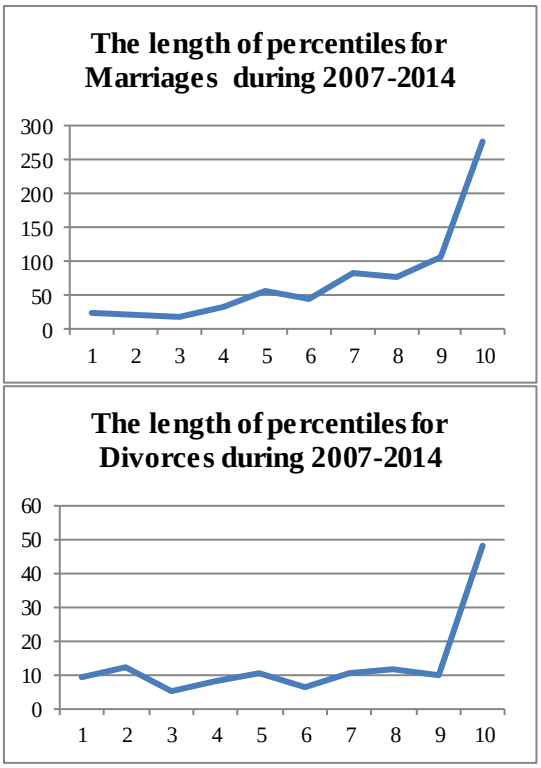


Figure 182

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Marriages/10000 inh. and Divorces/10000 inh. as in the figure 183.

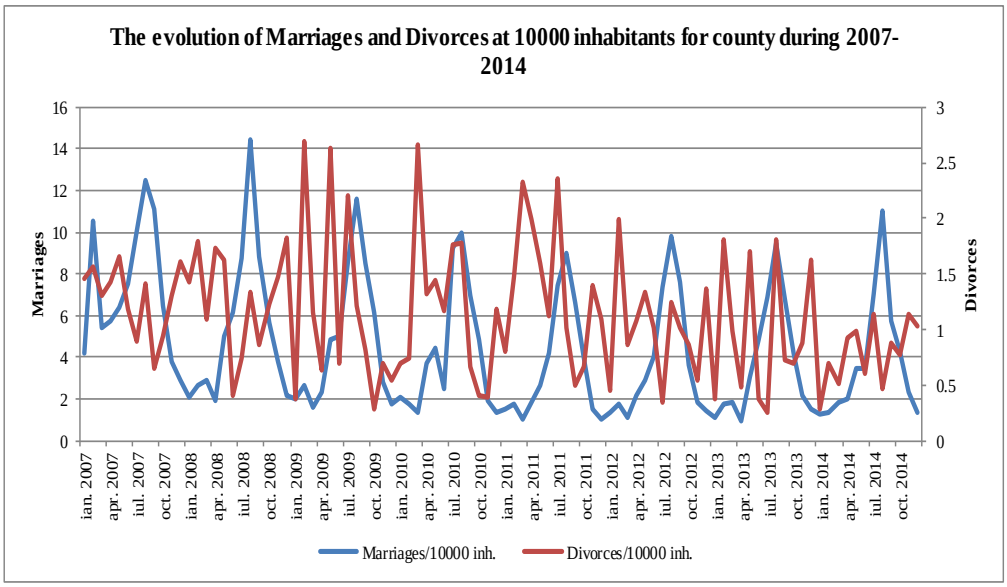


Figure 183

Regression analysis relative to indicator "Marriages/10000 inh." gives us an equation: y=-0.032157759x+6.112776316 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Divorces/10000 inh." gives us an equation: y=-0.005626628x+1.405495614 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Marriages/10000 inh." is 4 and for "Divorces/10000 inh." is 1. Also, the distribution of quartiles is for "Marriages/10000 inh.": (0.95,1.875,3.67,6.67,14.48) and for "Divorces/10000 inh.": (0.26,0.69,1.09,1.4625,2.69). The arithmetic mean and the standard deviation for "Marriages/10000 inh." are: (5,3.18) and for "Divorces/10000 inh.": (1,0.57). This means that with a probability greather than 0.68 "Marriages/10000 inh." are in the range [2,8] and for "Divorces/10000 inh." in [0,2].

Percentiles length indicators analysis (Figure 184) show that, indeed the concentration is around the middle of the data.

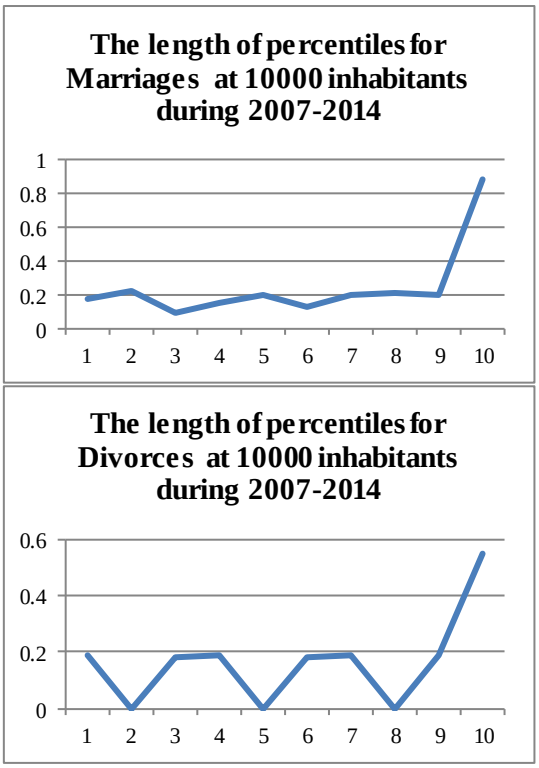


Figure 184

A comparison of the indicator "Marriages" with the national level shows that it is worse than the national, being better only in 29.17% cases. For "Divorces" the indicator is better than the national, being better in 60.42% cases.

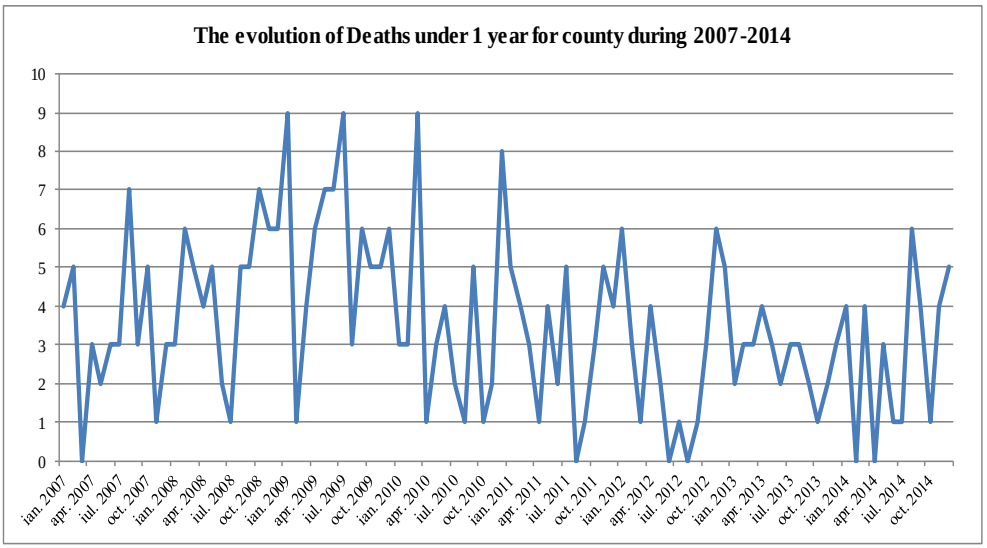


Figure 185

Regression analysis relative to indicator "Deaths under 1 year" gives us an equation: y=-0.021778351x+4.566666667 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Deaths under 1 year" is 3 and the distribution of quartiles is for "Deaths under 1 year": (0,2,3,5,9). The arithmetic mean and the standard deviation for "Deaths under 1 year" are: (4,2.16) which means that with a probability greather than 0.68 "Deaths under 1 year" are in the range [2,6].

Percentiles length indicators analysis (Figure 186) show that, indeed the concentration is around the middle of the data.

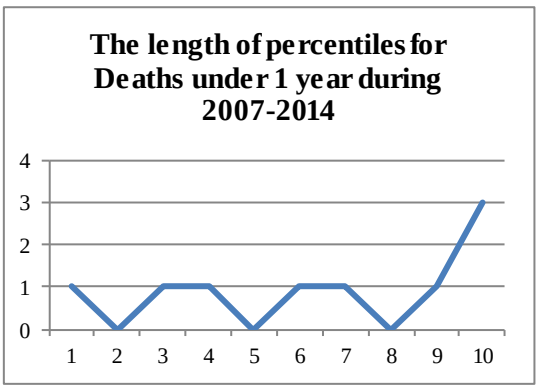


Figure 186

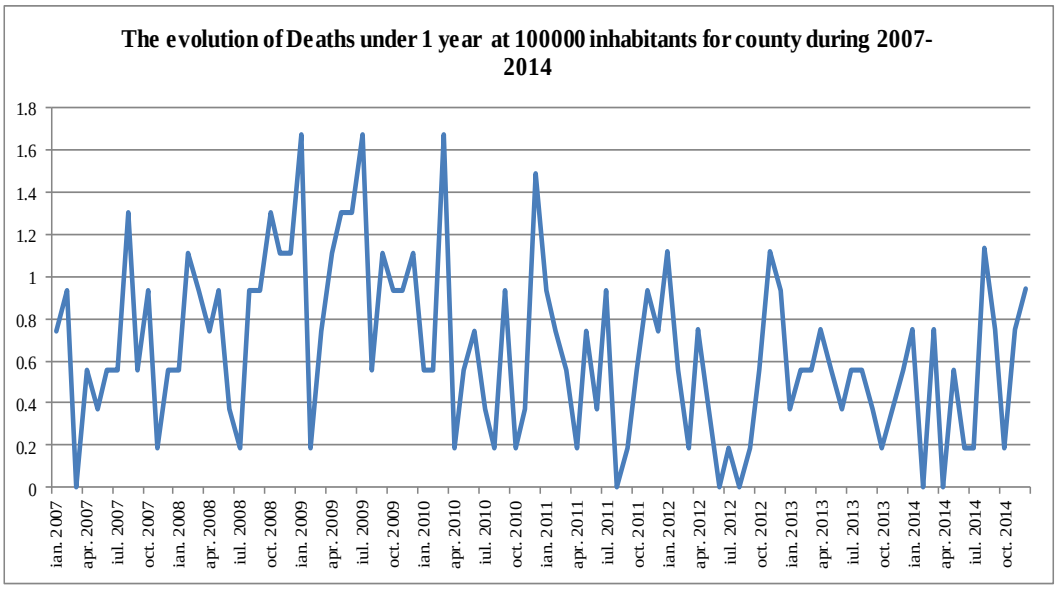


Figure 187

Regression analysis relative to indicator "Deaths under 1 year/100000 inh." gives us an equation: y=-0.003991386x+0.84722807 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Deaths under 1 year/100000 inh." is 1 and the distribution of quartiles is for "Deaths under 1 year/100000 inh.": (0,0.37,0.56,0.93,1.67). The arithmetic mean and the standard deviation for "Deaths under 1 year/100000 inh." are: (1,0.4) which means that with a probability greather than 0.68 "Deaths under 1 year/100000 inh." are in the range [1,1]. A comparison of the indicator "Deaths under 1 year" with the national level shows that it is better than the national, being better in 60.42% cases. A final analysis examines dependence aforementioned indicators of regional GDP variation.

Table 102. The evolution of Dambovita County GDP during 2007-2014

Year	GDP (in mil. lei 2007)	Variation (%)
2007	7944	-
2008	8075	1.64
2009	7639	-5.4
2010	8123	6.35
2011	7751	-4.58
2012	8185	5.6
2013	8145	-0.49
2014	7884	-3.2

Source: INSSE and own calculations

In what follows, we shall investigate if there is a dependency between GDP variation (noted with dGDP) and the aforementioned indicators.

Searching dependence annual variations of "Live births" from GDP, we find that there is a dependence of Live births from GDP offset by 2 years and the regression equation is:0.6501dGDP+-3.9413. Searching dependence annual variations of "Deceased" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Natural increase" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Marriages" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Divorces" from GDP, we find that there is a dependence of Divorces from GDP offset by 2 years and the regression equation is:-2.6053dGDP+-4.601. Searching dependence annual variations of "Deaths under 1 year" from GDP, we find that there is not a dependence of the variation of GDP.

2.18. Analysis of Natural Movement of Dolj County Population

Statistics of natural movement corresponding to Dolj County are the following:

Table 103. The natural movement of Dolj County population during 2007-2008

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,07	525	954	-429	581	52	10	ian,08	598	1002	-404	135	13	8
feb,07	444	827	-383	1376	50	5	feb,08	580	882	-302	219	67	3
mar,07	512	863	-351	869	74	5	mar,08	521	867	-346	175	61	5
apr,07	465	807	-342	547	79	6	apr,08	440	819	-379	131	67	10
mai,07	531	825	-294	447	74	7	mai,08	486	806	-320	409	90	4
iun,07	522	749	-227	427	76	3	iun,08	463	783	-320	404	69	9
iul,07	589	826	-237	665	33	6	iul,08	557	689	-132	538	7	5
aug,07	563	655	-92	630	4	5	aug,08	564	673	-109	789	81	4
sept,07	527	661	-134	810	61	7	sept,08	564	681	-117	583	59	3
oct,07	484	812	-328	691	76	6	oct,08	619	803	-184	539	47	3
nov,07	562	803	-241	373	67	3	nov,08	523	859	-336	271	46	5
dec,07	576	928	-352	210	51	8	dec,08	476	869	-393	150	63	12

Source: INSSE

Table 104. The natural movement of Dolj County population during 2009-2010

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,09	598	985	-387	135	10	6	ian,10	542	921	-379	116	13	1
feb,09	477	803	-326	169	62	2	feb,10	486	880	-394	155	24	3
mar,09	474	898	-424	132	74	6	mar,10	488	931	-443	105	33	5
apr,09	454	830	-376	219	86	5	apr,10	485	861	-376	263	39	1
mai,09	497	792	-295	332	46	3	mai,10	481	815	-334	344	34	2
iun,09	539	741	-202	350	51	7	iun,10	588	810	-222	128	38	1
iul,09	584	768	-184	552	0	4	iul,10	578	805	-227	527	5	3
aug,09	536	705	-169	745	61	5	aug,10	590	762	-172	624	46	4
sept,09	633	671	-38	585	79	6	sept,10	562	661	-99	537	11	0
oct,09	629	847	-218	575	28	8	oct,10	377	807	-430	453	18	3
nov,09	544	845	-301	208	21	2	nov,10	537	855	-318	122	24	8
dec,09	500	994	-494	128	44	0	dec,10	503	896	-393	97	35	2

Source: INSSE

Table 105. The natural movement of Dolj County population during 2011-2012

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,11	508	913	-405	75	15	3	ian,12	493	870	-377	90	8	3
feb,11	449	835	-386	98	38	3	feb,12	475	925	-450	92	55	3
mar,11	481	949	-468	63	44	4	mar,12	476	924	-448	82	41	3
apr,11	410	794	-384	149	34	3	apr,12	408	837	-429	232	28	3
mai,11	474	844	-370	237	38	4	mai,12	514	776	-262	208	33	3
iun,11	529	700	-171	302	37	2	iun,12	487	738	-251	320	40	5
iul,11	534	719	-185	474	20	5	iul,12	567	779	-212	402	52	5
aug,11	635	707	-72	509	47	3	aug,12	633	653	-20	588	51	3
sept,11	584	651	-67	553	23	4	sept,12	562	641	-79	606	44	5
oct,11	509	783	-274	395	13	4	oct,12	536	729	-193	368	20	6
nov,11	489	853	-364	152	30	6	nov,12	455	806	-351	125	39	6
dec,11	473	812	-339	93	21	8	dec,12	396	868	-472	97	61	2

Source: INSSE

Table 106. The natural movement of Dolj County population during 2013-2014

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,13	583	839	-256	68	13	5	ian,14	551	857	-306	100	16	3
feb,13	408	726	-318	108	59	1	feb,14	424	780	-356	93	24	3
mar,13	389	852	-463	135	50	3	mar,14	460	820	-360	82	19	7
apr,13	426	787	-361	112	19	0	apr,14	456	825	-369	148	63	3
mai,13	482	774	-292	247	44	4	mai,14	414	858	-444	279	45	4
iun,13	426	749	-323	381	56	10	iun,14	477	740	-263	281	30	3
iul,13	503	703	-200	373	25	7	iul,14	529	763	-234	441	25	8
aug,13	552	729	-177	572	28	4	aug,14	532	710	-178	698	35	1
sept,13	605	647	-42	482	17	6	sept,14	603	664	-61	517	63	2
oct,13	564	789	-225	346	42	5	oct,14	537	832	-295	401	15	5
nov,13	432	783	-351	146	36	4	nov,14	497	800	-303	175	54	0
dec,13	410	863	-453	92	20	5	dec,14	454	909	-455	100	19	4

Source: INSSE

Table 107. The population trends of Dolj County during 2007-2014

Year	Population	Year	Population
2007	731228	2011	718662
2008	728295	2012	715186
2009	725464	2013	711844
2010	722251	2014	708129

Source: INSSE

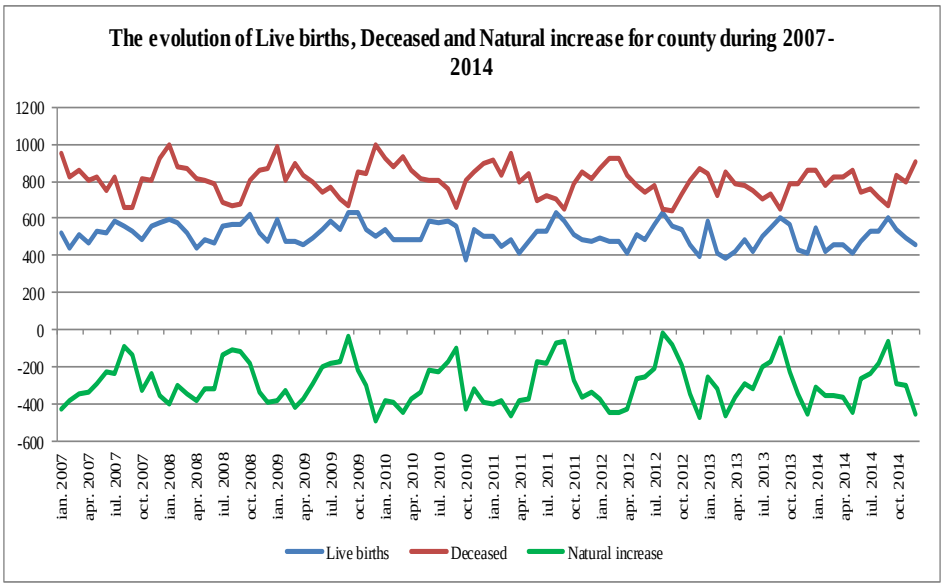


Figure 188

From figure 188 we can see a sinusoidal evolution of the indicator. #VALUE!

Regression analysis relative to indicator "Live births" gives us an equation: y=-0.532935431x+537.9723684 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Deceased" gives us an equation: y=-0.517410472x+829.5839912 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Natural increase" gives us an equation: y=-0.015524959x+-291.6116228 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Live births" is 511, for "Deceased" is 807 and for "Natural increase": -319. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births": (377,474,510.5,562,635), for "Deceased": (641,747,807,858.25,1002) and for "Natural increase": (-494,-379,-319,-209.5,-20).

The arithmetic mean and the standard deviation for "Live births" are: (512,61.48), for "Deceased": (804,84.07) and for "Natural increase": (-292,116.87). This means

that with a probability greather than 0.68 “Live births” are in the range [451,573], for “Deceased” in [720,888] and for “Natural increase” in [-409,-175].

Percentiles length indicators analysis (Figure 189) show that, indeed the concentration is around the middle of the data.

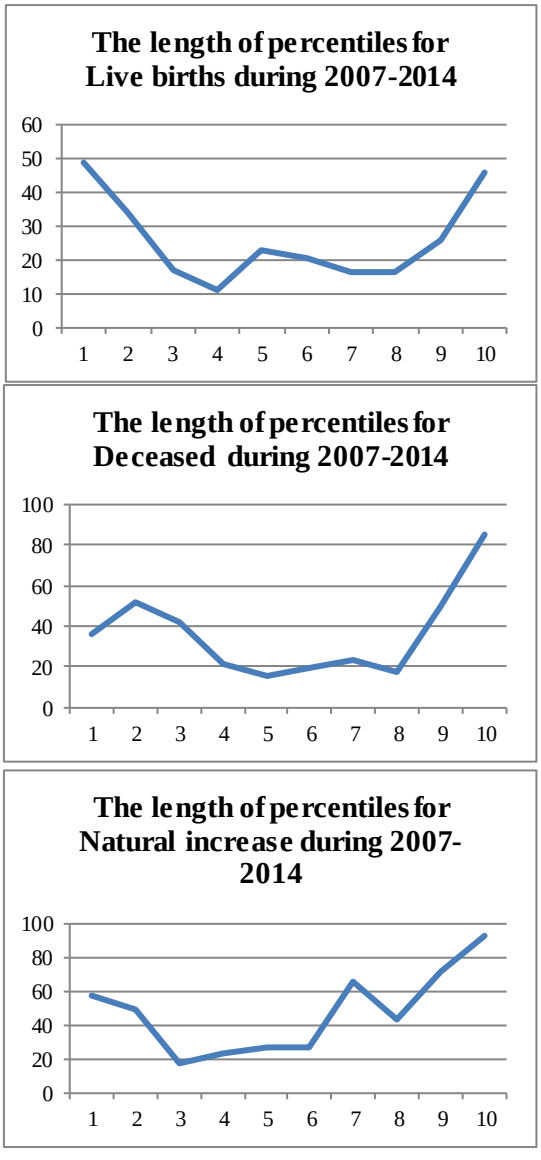


Figure 189

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Live births/10000 inh., Deceased/10000 inh. and Natural increase/10000 inh. as in the figure 190.

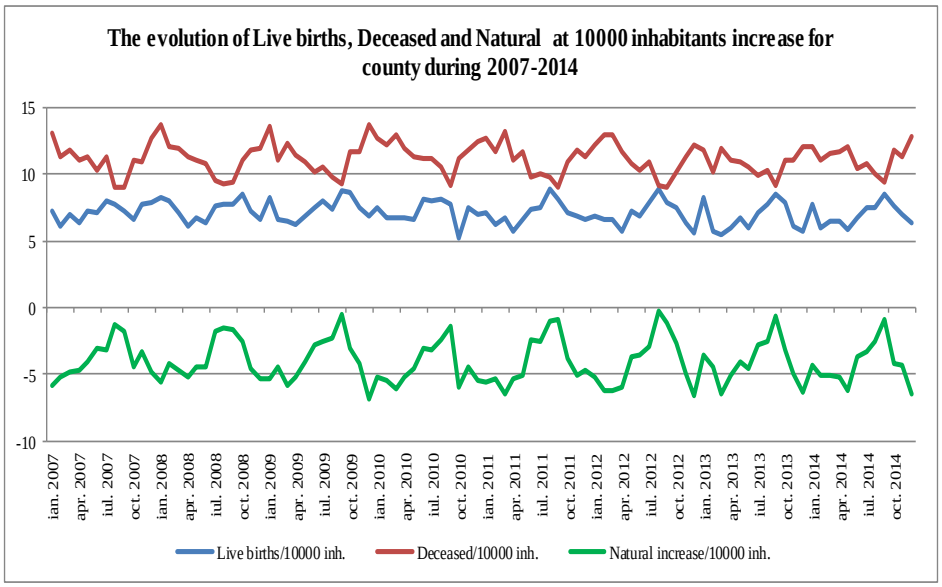


Figure 190

Regression analysis relative to indicator "Live births/10000 inh." gives us an equation: y=-0.004724566x+7.339037281 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Deceased/10000 inh." gives us an equation: y=-0.002985282x+11.31572368 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Natural increase/10000 inh." gives us an equation: y=-0.001735757x+-3.976232456 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Live births/10000 inh." is 7, for "Deceased/10000 inh." is 11 and for "Natural increase/10000 inh.": -4. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births/10000 inh.": (5.22,6.57,7.075,7.7425,8.85), for "Deceased/10000 inh.": (8.96,10.4175,11.19,11.905,13.76) and for "Natural increase/10000 inh.": (-6.81,-5.2425,-4.395,-2.9225,-0.28).

The arithmetic mean and the standard deviation for "Live births/10000 inh." are: (7,0.84), for "Deceased/10000 inh.": (11,1.16) and for "Natural increase/10000 inh.": (-4,1.63). This means that with a probability greather than 0.68 "Live births/10000 inh." are in the range [6,8], for "Deceased/10000 inh." in [10,12] and for "Natural increase/10000 inh." in [-6,-2]. Percentiles length indicators analysis (Figure 191) show that, indeed the concentration is around the middle of the data.

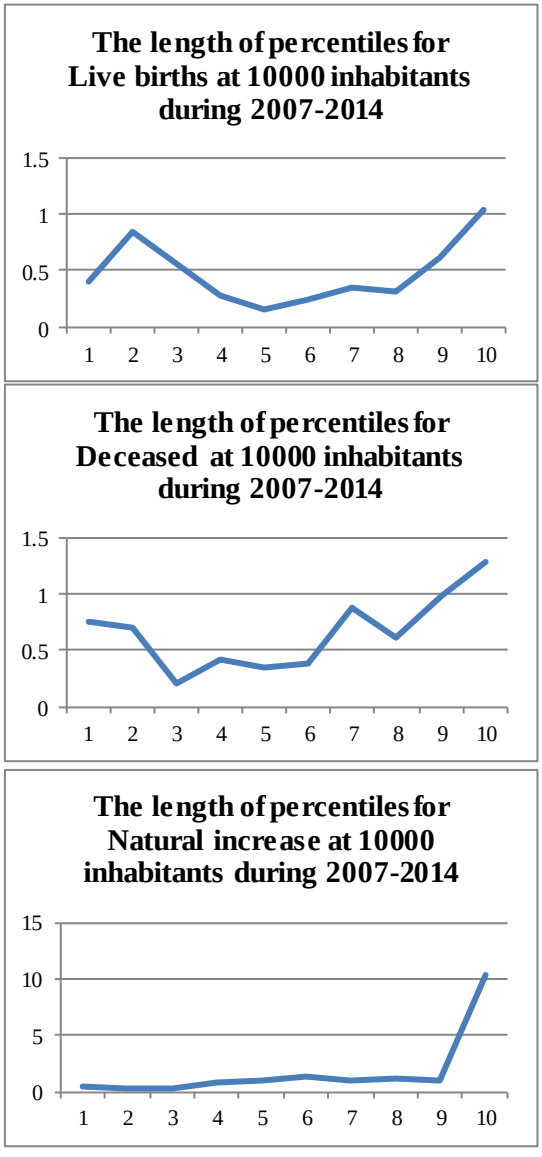


Figure 191

A comparison of the indicator "Live births" with the national level shows that it is worse than the national, being better only in 16.67% cases. For "Deceased" the indicator is worse than the national, being better only in 0% cases. Finally, for "Natural increase", the indicator is worse than the national, being better only in 0% cases.

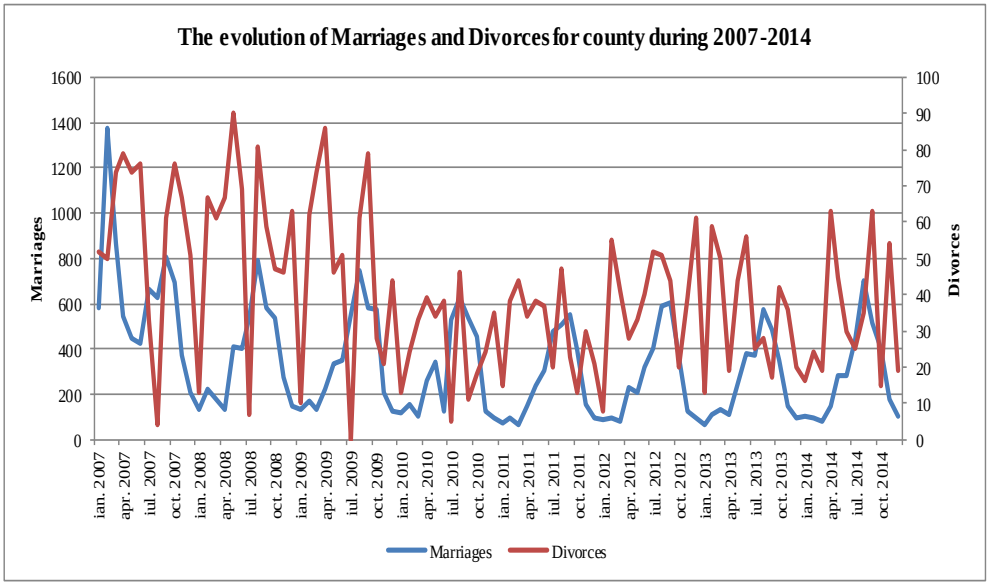


Figure 192

Regression analysis relative to indicator "Marriages" gives us an equation: y=-3.04049783x+483.4745614 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Divorces" gives us an equation: y=-0.291454151x+54.73969298 where x is the number of month (Jan, 2007=1), therefore a downward trend.

For the set of values above, the median indicator for "Marriages" is 280 and for "Divorces" is 39. Also, the distribution of quartiles is for "Marriages": (63,131.75,280,519.5,1376) and for "Divorces": (0,22.5,39,56.75,90). The arithmetic mean and the standard deviation for "Marriages" are: (336,235.45) and for "Divorces": (41,21.46). This means that with a probability greather than 0.68 "Marriages" are in the range [101,571] and for "Divorces" in [20,62].

Percentiles length indicators analysis (Figure 193) show that, indeed the concentration is around the middle of the data.

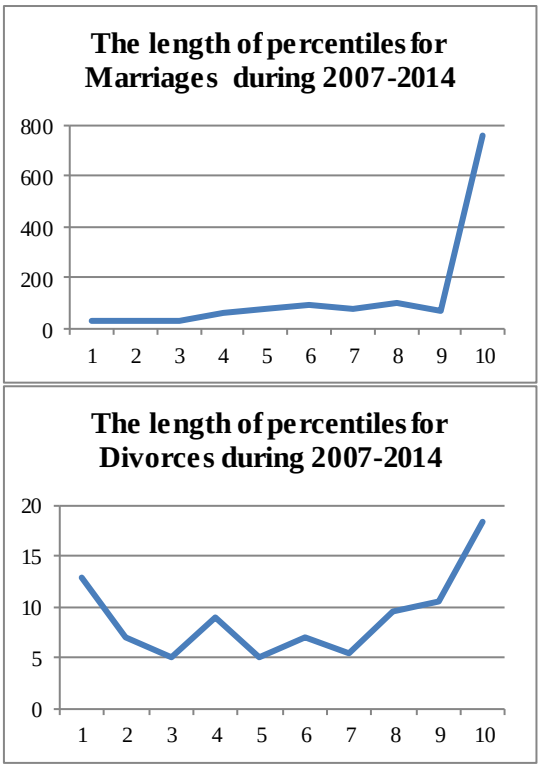


Figure 193

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Marriages/10000 inh. and Divorces/10000 inh. as in the figure 194.

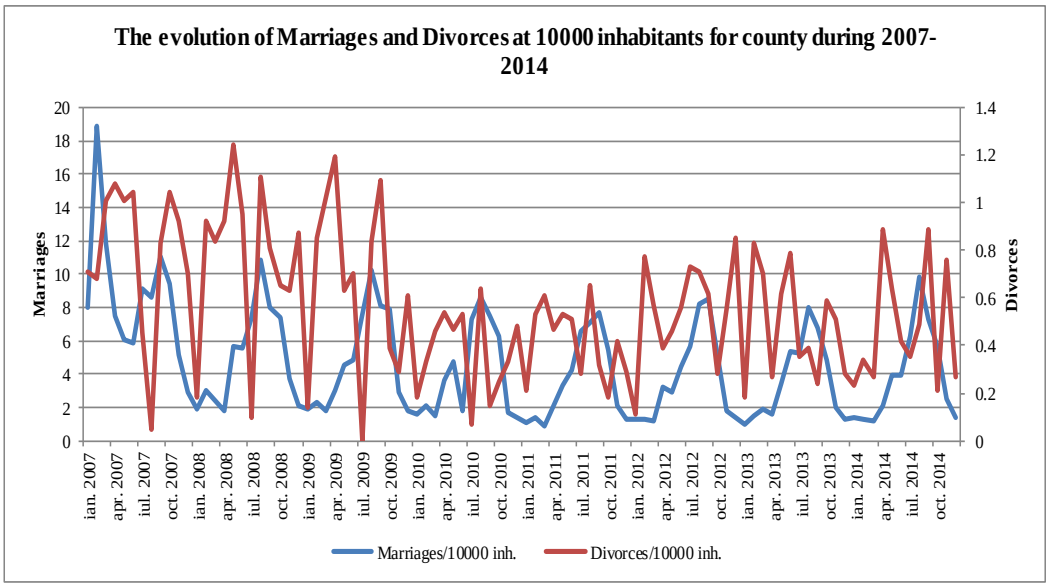


Figure 194

Regression analysis relative to indicator "Marriages/10000 inh." gives us an equation: y=-0.040162642x+6.601638158 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Divorces/10000 inh." gives us an equation: y=-0.003813144x+0.74775 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Marriages/10000 inh." is 4 and for "Divorces/10000 inh." is 1. Also, the distribution of quartiles is for "Marriages/10000 inh.": (0.88,1.815,3.955,7.3,18.82) and for "Divorces/10000 inh.": (0,0.3125,0.545,0.795,1.24). The arithmetic mean and the standard deviation for "Marriages/10000 inh." are: (5,3.24) and for "Divorces/10000 inh.": (1,0.29). This means that with a probability greather than 0.68 "Marriages/10000 inh." are in the range [2,8] and for "Divorces/10000 inh." in [1,1].

Percentiles length indicators analysis (Figure 195) show that, indeed the concentration is around the middle of the data.

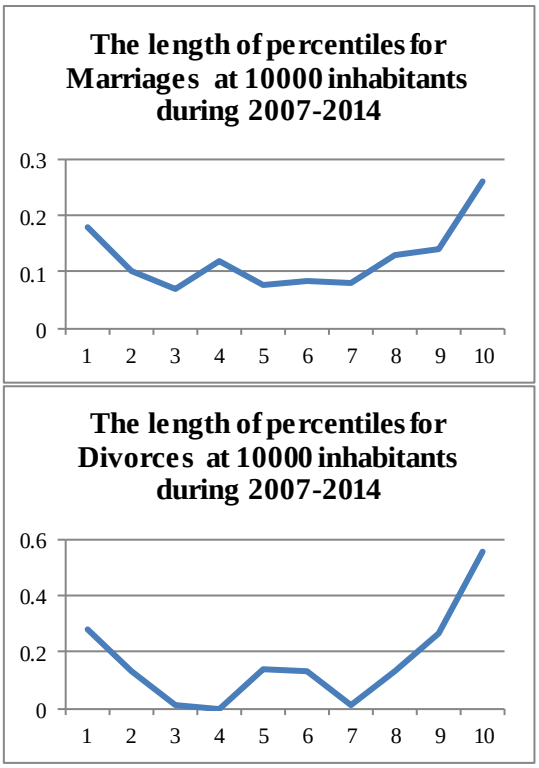


Figure 195

A comparison of the indicator "Marriages" with the national level shows that it is worse than the national, being better only in 28.13% cases. For "Divorces" the indicator is better than the national, being better in 96.88% cases.

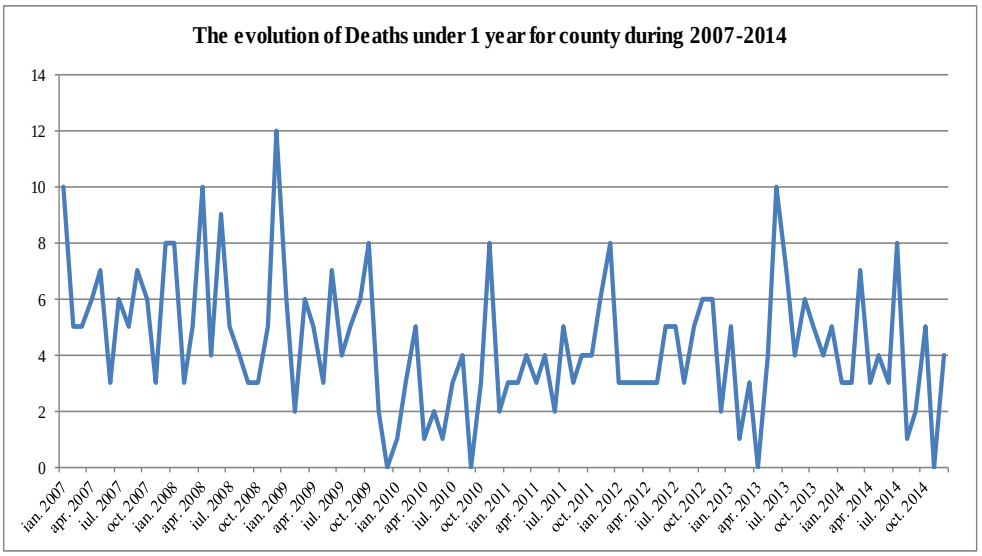


Figure 196

Regression analysis relative to indicator "Deaths under 1 year" gives us an equation: y=-0.022314162x+5.478070175 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Deaths under 1 year" is 4 and the distribution of quartiles is for "Deaths under 1 year": (0,3,4,6,12). The arithmetic mean and the standard deviation for "Deaths under 1 year" are: (4,2.37) which means that with a probability greather than 0.68 "Deaths under 1 year" are in the range [2,6].

Percentiles length indicators analysis (Figure 197) show that, indeed the concentration is around the middle of the data.

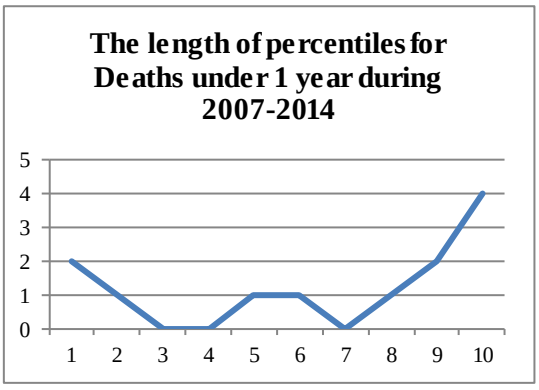


Figure 197

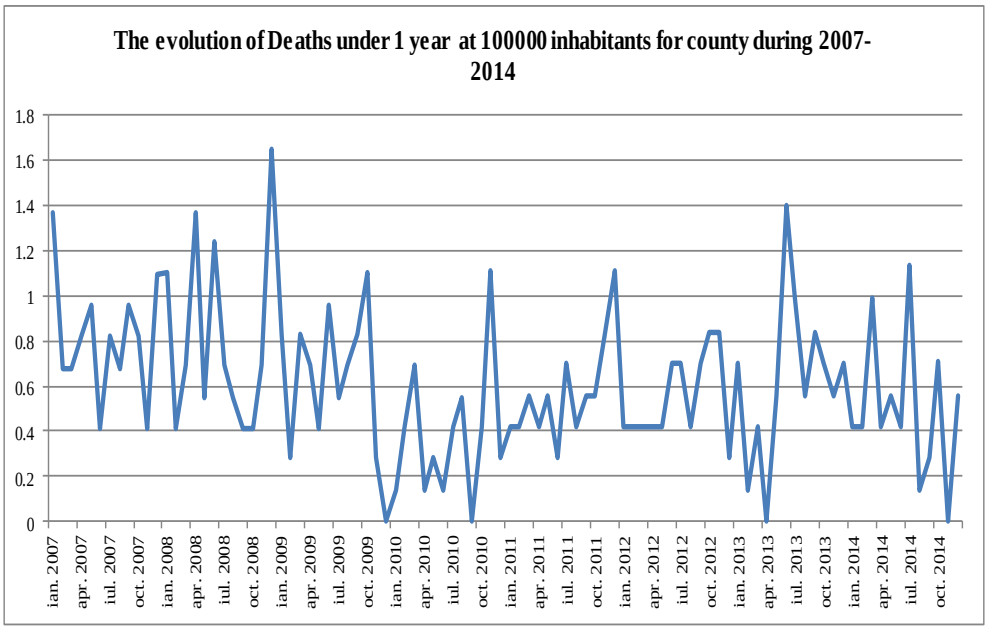


Figure 198

Regression analysis relative to indicator "Deaths under 1 year/100000 inh." gives us an equation: y=-0.002869981x+0.748881579 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Deaths under 1 year/100000 inh." is 1 and the distribution of quartiles is for "Deaths under 1 year/100000 inh.": (0,0.42,0.56,0.82,1.65). The arithmetic mean and the standard deviation for "Deaths under 1 year/100000 inh." are: (1,0.33) which means that with a probability greather than 0.68 "Deaths under 1 year/100000 inh." are in the range [1,1].

A comparison of the indicator "Deaths under 1 year" with the national level shows that it is better than the national, being better in 68.75% cases.

A final analysis examines dependence aforementioned indicators of regional GDP variation.

Table 108. The evolution of Dolj County GDP during 2007-2014

Year	GDP (in mil. lei 2007)	Variation (%)
2007	10554	-
2008	11726	11.1
2009	11168	-4.76

2010	10670	-4.46
2011	10716	0.44
2012	10618	-0.92
2013	10805	1.76
2014	11263	4.24

Source: INSSE and own calculations

In what follows, we shall investigate if there is a dependency between GDP variation (noted with dGDP) and the aforementioned indicators.

Searching dependence annual variations of "Live births" from GDP, we find that there is a dependence of Live births from GDP offset by 1 year and the regression equation is:0.3131dGDP+-1.3649.

Searching dependence annual variations of "Deceased" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Natural increase" from GDP, we find that there is a dependence of Natural increase from GDP offset by 2 years and the regression equation is:0.8677dGDP+1.161.

Searching dependence annual variations of "Marriages" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Divorces" from GDP, we find that there is a dependence of Divorces from GDP offset by 2 years and the regression equation is: -4.0757dGDP+-1.4668. Searching dependence annual variations of "Deaths under 1 year" from GDP, we find that there is a dependence of Deaths under 1 year from GDP offset by 2 years and the regression equation is:-3.7196dGDP+1.0475.

2.19. Analysis of Natural Movement of Galati County Population

Statistics of natural movement corresponding to Galati County are the following:

Table 109. The natural movement of Galati County population during 2007-2008

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,07	507	659	-152	449	162	8	ian,08	584	698	-114	148	5	8
feb,07	447	570	-123	614	169	3	feb,08	414	555	-141	237	136	3
mar,07	443	527	-84	292	142	10	mar,08	435	570	-135	213	106	6
apr,07	415	518	-103	336	152	6	apr,08	446	541	-95	129	169	10
mai,07	492	566	-74	295	111	5	mai,08	427	540	-113	243	124	7
iun,07	484	502	-18	357	146	3	iun,08	487	528	-41	348	175	4
iul,07	546	576	-30	486	42	3	iul,08	551	477	74	464	109	2
aug,07	488	475	13	888	30	4	aug,08	487	452	35	1074	147	3
sept,07	471	436	35	659	74	9	sept,08	557	480	77	542	107	4
oct,07	485	552	-67	503	193	7	oct,08	539	560	-21	476	103	7
nov,07	457	573	-116	304	187	6	nov,08	433	595	-162	253	109	10
dec,07	445	602	-157	189	107	3	dec,08	483	643	-160	192	105	5

Source: INSSE

Table 110. The natural movement of Galati County population during 2009-2010

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,09	505	655	-150	146	64	10	ian,10	429	658	-229	149	39	6
feb,09	458	544	-86	192	94	5	feb,10	436	635	-199	133	84	6
mar,09	468	627	-159	79	145	4	mar,10	454	561	-107	99	88	6
apr,09	459	624	-165	136	80	6	apr,10	393	592	-199	168	57	6
mai,09	451	570	-119	242	104	5	mai,10	470	561	-91	228	58	2
iun,09	435	530	-95	257	77	5	iun,10	486	551	-65	111	70	3
iul,09	590	478	112	484	84	6	iul,10	531	552	-21	415	129	4
aug,09	539	468	71	855	57	7	aug,10	488	546	-58	732	97	3
sept,09	582	440	142	502	80	7	sept,10	465	503	-38	426	105	6
oct,09	542	549	-7	427	67	9	oct,10	431	589	-158	290	73	5
nov,09	451	527	-76	177	59	3	nov,10	460	542	-82	115	72	3
dec,09	481	679	-198	143	26	6	dec,10	428	614	-186	105	79	3

Source: INSSE

Table 111. The natural movement of Galati County population during 2011-2012

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,11	391	655	-264	121	56	4	ian,12	423	609	-186	115	63	6
feb,11	360	572	-212	101	148	7	feb,12	301	695	-394	94	108	5
mar,11	396	602	-206	75	108	5	mar,12	353	672	-319	73	92	8
apr,11	291	567	-276	112	129	8	apr,12	292	561	-269	133	93	8
mai,11	344	462	-118	182	96	6	mai,12	383	552	-169	157	83	10
iun,11	339	470	-131	201	100	2	iun,12	344	556	-212	221	79	7
iul,11	392	488	-96	338	115	4	iul,12	474	502	-28	330	110	2
aug,11	490	476	14	674	121	8	aug,12	482	473	9	692	97	6
sept,11	446	422	24	411	34	3	sept,12	446	437	9	473	54	3
oct,11	415	544	-129	256	144	6	oct,12	411	549	-138	246	75	5
nov,11	350	510	-160	119	41	2	nov,12	364	531	-167	151	106	4
dec,11	375	636	-261	117	148	4	dec,12	298	594	-296	134	87	4

Source: INSSE

Table 112. The natural movement of Galati County population during 2013-2014

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,13	414	539	-125	79	96	0	ian,14	416	605	-189	120	38	3
feb,13	313	528	-215	82	109	6	feb,14	385	637	-252	127	87	3
mar,13	354	552	-198	121	94	3	mar,14	398	579	-181	83	69	4
apr,13	343	576	-233	71	49	4	apr,14	350	615	-265	149	66	3
mai,13	315	558	-243	165	67	4	mai,14	397	566	-169	200	100	3
iun,13	352	510	-158	247	52	3	iun,14	374	486	-112	227	49	4
iul,13	398	503	-105	308	41	5	iul,14	473	480	-7	376	71	5
aug,13	468	493	-25	716	46	4	aug,14	529	507	22	860	80	1
sept,13	428	480	-52	355	133	2	sept,14	502	544	-42	418	33	6
oct,13	449	599	-150	242	46	3	oct,14	496	598	-102	308	21	5
nov,13	381	515	-134	129	40	3	nov,14	362	535	-173	176	22	3
dec,13	338	639	-301	119	53	2	dec,14	361	612	-251	157	38	3

Source: INSSE

Table 113. The population trends of Galati County during 2007-2014

Year	Population	Year	Population
2007	647030	2011	640498
2008	645697	2012	638850
2009	644030	2013	638367
2010	642573	2014	636818

Source: INSSE

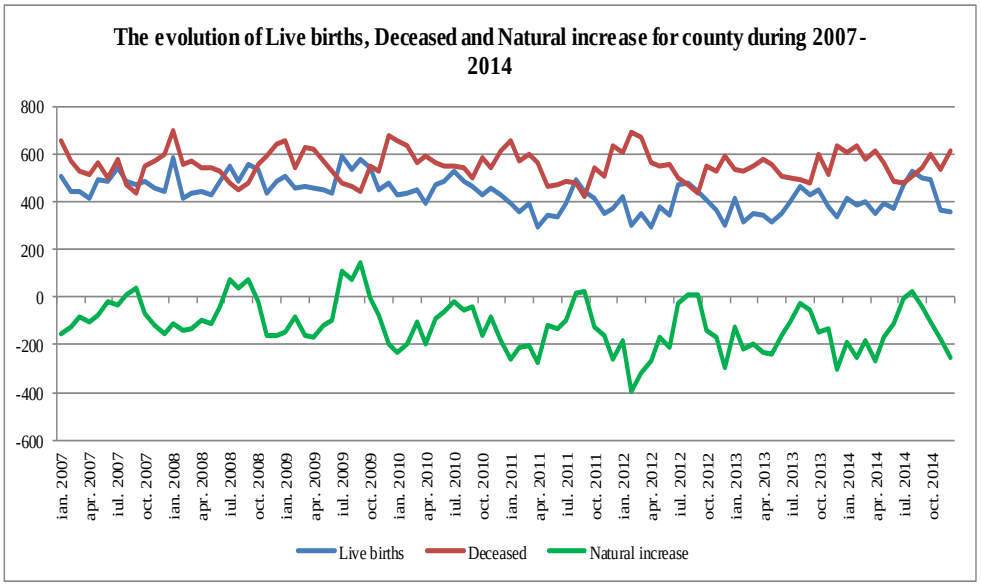


Figure 199

From figure 199 we can see a sinusoidal evolution of the indicator. Except months aug 2007, sept 2007, iul 2008, aug 2008, sept 2008, iul 2009, aug 2009, sept 2009, aug 2011, sept 2011, aug 2012, sept 2012, aug 2014 the natural increase was negative.

Regression analysis relative to indicator "Live births" gives us an equation: y=-1.253099566x+495.2649123 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Deceased" gives us an equation: y=-0.047958492x+556.2947368 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

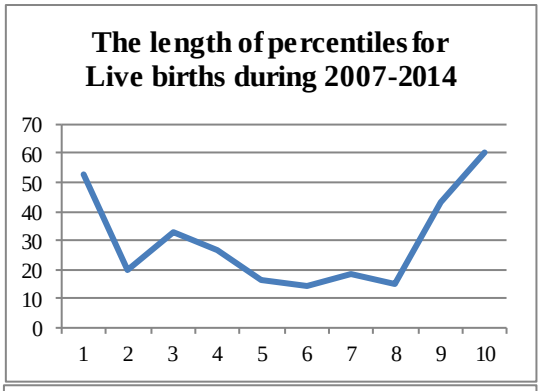
Regression analysis relative to indicator "Natural increase" gives us an equation: y=-1.205141074x+-61.02982456 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

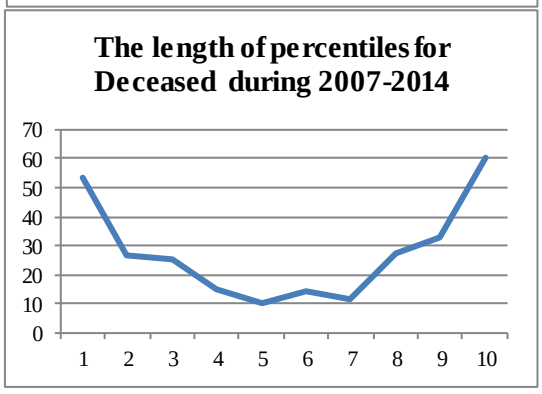
For the set of values above, the median indicator for “Live births” is 440, for “Deceased” is 552 and for “Natural increase”: -124. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for “Live births”: (291,384.5,439.5,483.25,590), for “Deceased”: (422,509.25,552,595.75,698) and for “Natural increase”: (-394,-186,-124,-49.5,142).

The arithmetic mean and the standard deviation for “Live births” are: (434,69.11), for “Deceased”: (554,61.96) and for “Natural increase”: (-119,101.17). This means that with a probability greather than 0.68 “Live births” are in the range [365,503], for “Deceased” in [492,616] and for “Natural increase” in [-220,-18].

Percentiles length indicators analysis (Figure 200) show that, indeed the concentration is around the middle of the data.





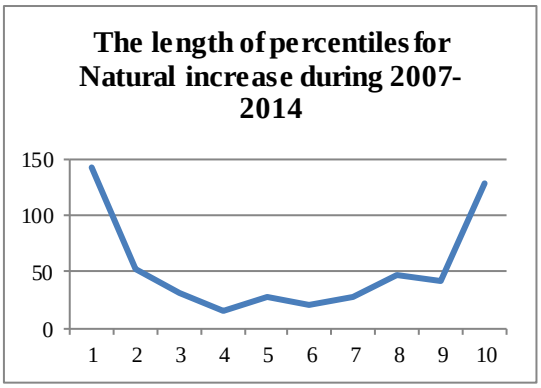


Figure 200

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Live births/10000 inh., Deceased/10000 inh. and Natural increase/10000 inh. as in the figure 201.

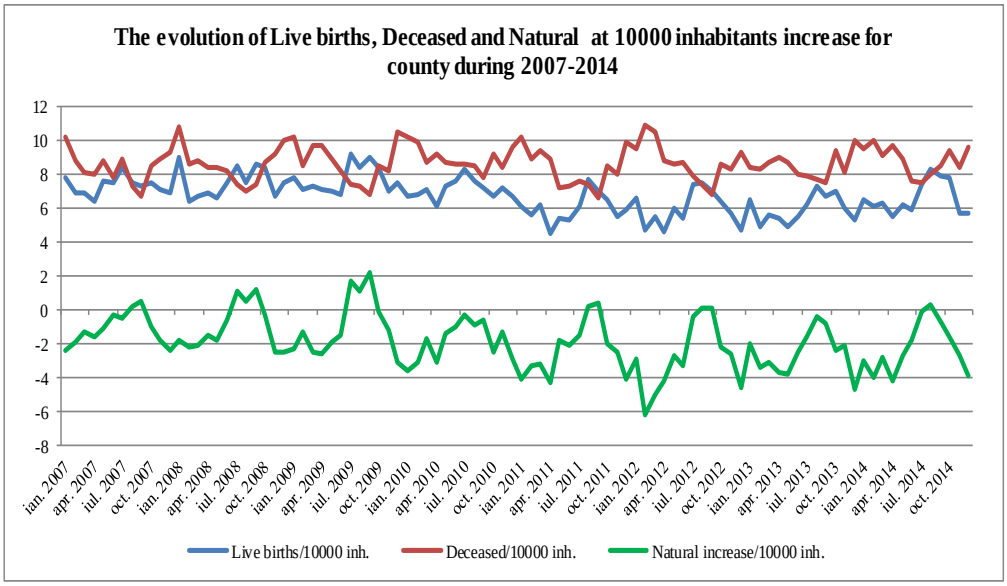


Figure 201

Regression analysis relative to indicator "Live births/10000 inh." gives us an equation: y=-0.018226668x+7.651076754 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Deceased/10000 inh." gives us an equation: y=0.000894194x+8.588923246 where x is the number of month (Jan, 2007=1), therefore a very small upward trend.

Regression analysis relative to indicator “Natural increase/10000 inh.” gives us an equation: y=-0.019101465x+-0.938995614 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for “Live births/10000 inh.” is 7, for “Deceased/10000 inh.” is 9 and for “Natural increase/10000 inh.”: -2. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for “Live births/10000 inh.”: (4.54,6.0375,6.82,7.485,9.16), for “Deceased/10000 inh.”: (6.59,7.96,8.595,9.3,10.88) and for “Natural increase/10000 inh.”: (-6.17,-2.895,-1.93,-0.7725,2.2).

The arithmetic mean and the standard deviation for “Live births/10000 inh.” are: (7,1.06), for “Deceased/10000 inh.”: (9,0.97) and for “Natural increase/10000 inh.”: (-2,1.58). This means that with a probability greather than 0.68 “Live births/10000 inh.” are in the range [6,8], for “Deceased/10000 inh.” in [8,10] and for “Natural increase/10000 inh.” in [-4,0].

Percentiles length indicators analysis (Figure 202) show that, indeed the concentration is around the middle of the data.

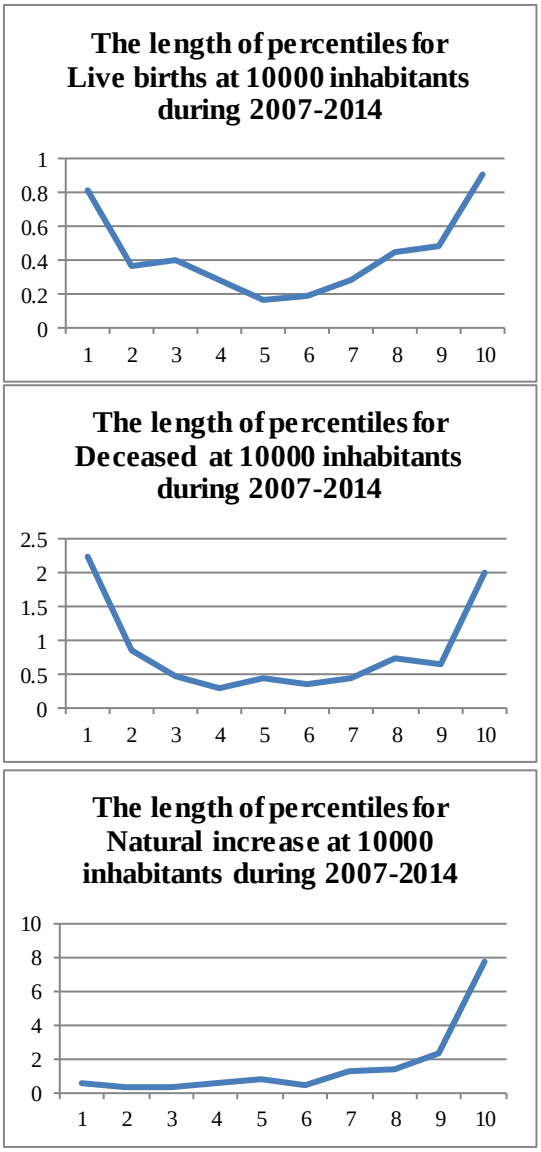


Figure 202

A comparison of the indicator "Live births" with the national level shows that it is worse than the national, being better only in 3.13% cases. For "Deceased" the indicator is better than the national, being better in 94.79% cases. Finally, for "Natural increase", the indicator is about the same with the national, being better in 44.79% cases.

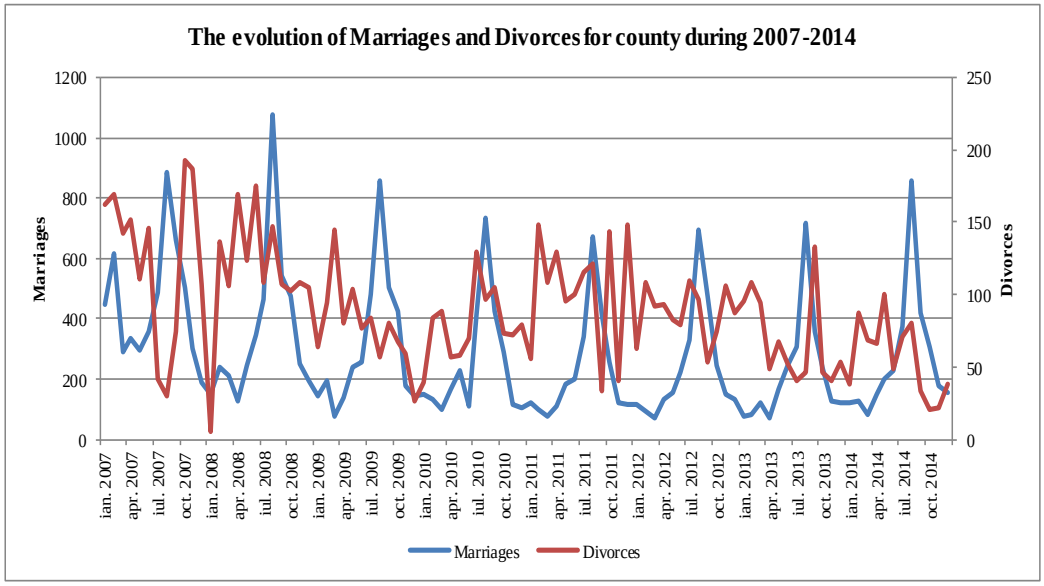


Figure 203

Regression analysis relative to indicator "Marriages" gives us an equation: y=-1.893332881x+379.9828947 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Divorces" gives us an equation: y=-0.683037168x+122.554386 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

For the set of values above, the median indicator for "Marriages" is 224 and for "Divorces" is 87. Also, the distribution of quartiles is for "Marriages": (71,132,224,384.75,1074) and for "Divorces": (5,57.75,87,109,193). The arithmetic mean and the standard deviation for "Marriages" are: (288,210.39) and for "Divorces": (89,40.35). This means that with a probability greather than 0.68 "Marriages" are in the range [78,498] and for "Divorces" in [49,129].

Percentiles length indicators analysis (Figure 204) show that, indeed the concentration is around the middle of the data.

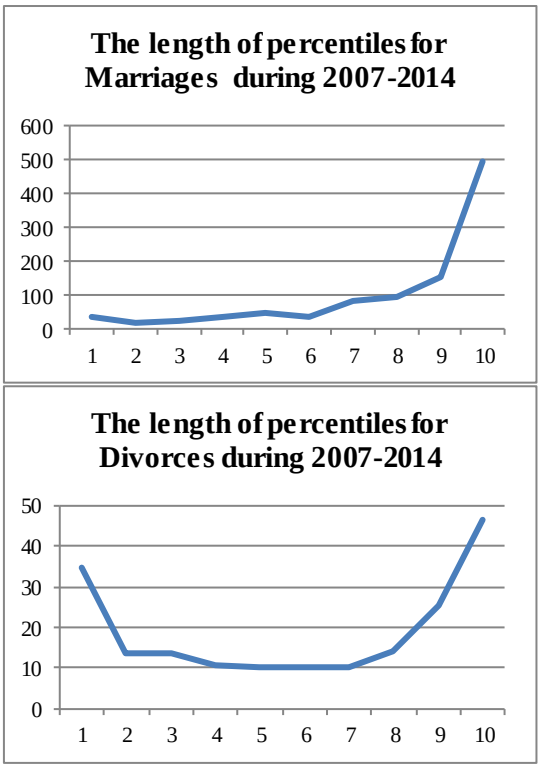


Figure 204

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Marriages/10000 inh. and Divorces/10000 inh. as in the figure 205.

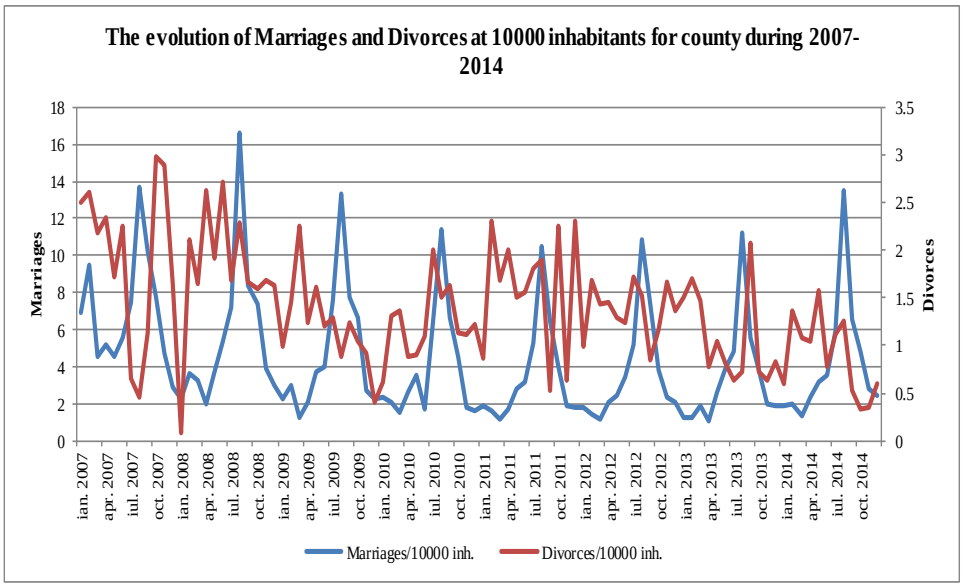


Figure 205

Regression analysis relative to indicator "Marriages/10000 inh." gives us an equation: y=-0.028533641x+5.868673246 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Divorces/10000 inh." gives us an equation: y=-0.010362792x+1.894991228 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Marriages/10000 inh." is 4 and for "Divorces/10000 inh." is 1. Also, the distribution of quartiles is for "Marriages/10000 inh.": (1.11,2.0575,3.505,6.03,16.63) and for "Divorces/10000 inh.": (0.08,0.8975,1.365,1.695,2.98). The arithmetic mean and the standard deviation for "Marriages/10000 inh." are: (4,3.27) and for "Divorces/10000 inh.": (1,0.62). This means that with a probability greather than 0.68 "Marriages/10000 inh." are in the range [1,7] and for "Divorces/10000 inh." in [0,2].

Percentiles length indicators analysis (Figure 206) show that, indeed the concentration is around the middle of the data.

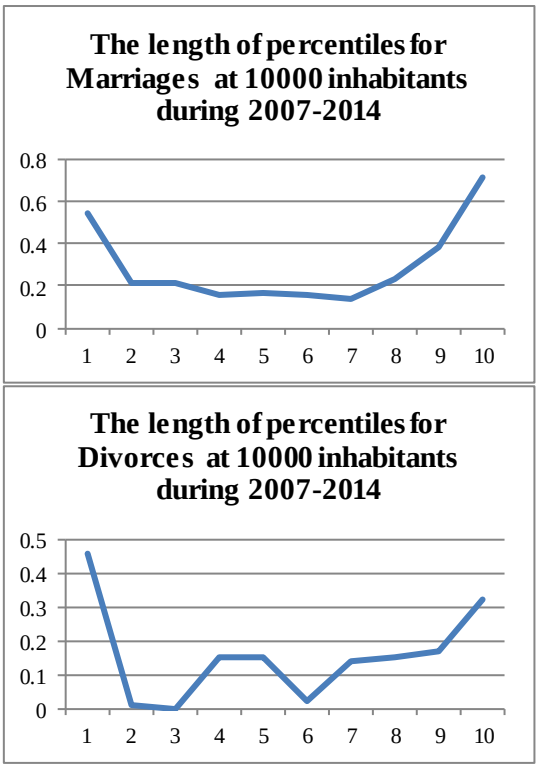


Figure 206

A comparison of the indicator "Marriages" with the national level shows that it is worse than the national, being better only in 29.17% cases. For "Divorces" the indicator is worse than the national, being better only in 31.25% cases.

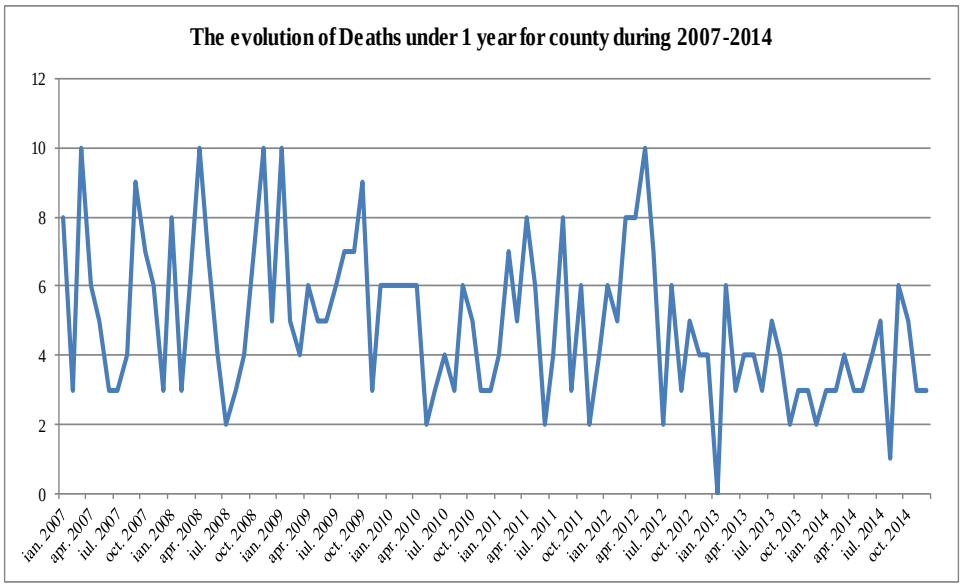


Figure 207

Regression analysis relative to indicator "Deaths under 1 year" gives us an equation: y=-0.028425122x+6.284868421 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Deaths under 1 year" is 5 and the distribution of quartiles is for "Deaths under 1 year": (0,3,5,6,10). The arithmetic mean and the standard deviation for "Deaths under 1 year" are: (5,2.2) which means that with a probability greather than 0.68 "Deaths under 1 year" are in the range [3,7].

Percentiles length indicators analysis (Figure 208) show that, indeed the concentration is around the middle of the data.

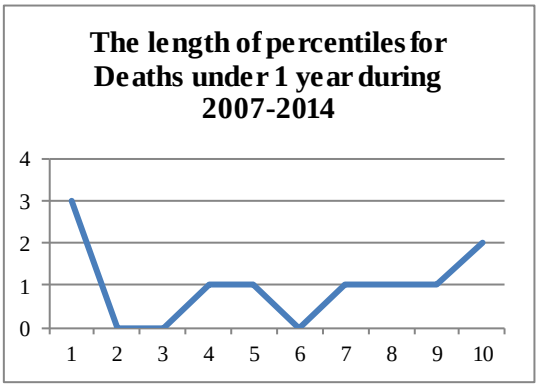


Figure 208

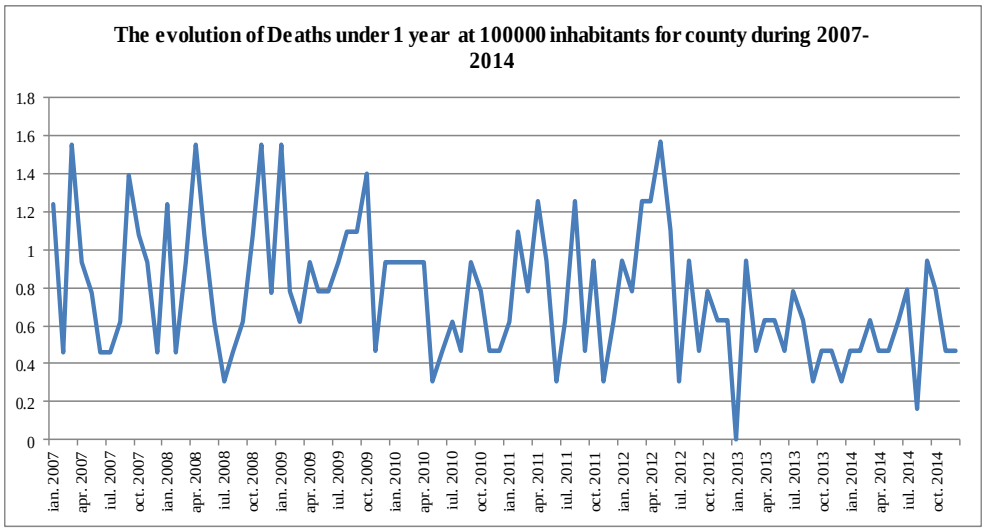


Figure 209

Regression analysis relative to indicator "Deaths under 1 year/100000 inh." gives us an equation: y=-0.00427462x+0.971173246 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Deaths under 1 year/100000 inh." is 1 and the distribution of quartiles is for "Deaths under 1 year/100000 inh.": (0,0.47,0.77,0.94,1.57). The arithmetic mean and the standard deviation for "Deaths under 1 year/100000 inh." are: (1,0.34) which means that with a probability greather than 0.68 "Deaths under 1 year/100000 inh." are in the range [1,1]. A comparison of the indicator "Deaths under 1 year" with the national level shows that it is about the same with the national, being better in 53.13% cases. A final analysis examines dependence aforementioned indicators of regional GDP variation.

Table 114. The evolution of Galati County GDP during 2007-2014

Year	GDP (in mil. lei 2007)	Variation (%)
2007	8534	-
2008	9177	7.53
2009	8050	-12.28
2010	8676	7.78
2011	8496	-2.07
2012	8092	-4.76
2013	8462	4.57
2014	8601	1.65

Source: INSSE and own calculations

In what follows, we shall investigate if there is a dependency between GDP variation (noted with dGDP) and the aforementioned indicators.

Searching dependence annual variations of "Live births" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Deceased" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Natural increase" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Marriages" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Divorces" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Deaths under 1 year" from GDP, we find that there is not a dependence of the variation of GDP.

2.20. Analysis of natural movement of Giurgiu County population

Statistics of natural movement corresponding to Giurgiu County are the following:

Table 115. The natural movement of Giurgiu County population during 2007-2008

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,07	219	455	-236	156	22	6	ian,08	224	457	-233	52	0	3
feb,07	180	344	-164	305	12	3	feb,08	210	391	-181	92	10	1
mar,07	228	412	-184	205	15	2	mar,08	227	391	-164	66	59	5
apr,07	212	395	-183	176	14	3	apr,08	197	366	-169	54	37	2
mai,07	220	379	-159	169	24	2	mai,08	221	358	-137	160	19	2
iun,07	235	318	-83	216	21	0	iun,08	238	367	-129	171	15	5
iul,07	210	346	-136	293	1	1	iul,08	271	314	-43	229	14	3
aug,07	238	321	-83	282	2	1	aug,08	271	303	-32	340	21	6
sept,07	246	268	-22	327	17	6	sept,08	278	324	-46	234	18	2
oct,07	225	365	-140	256	13	4	oct,08	237	373	-136	210	9	0
nov,07	189	416	-227	128	18	2	nov,08	228	363	-135	92	7	0
dec,07	216	435	-219	78	29	3	dec,08	235	433	-198	26	22	3

Source: INSSE

Table 116. The natural movement of Giurgiu County population during 2009-2010

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,09	220	436	-216	39	0	5	ian,10	213	406	-193	42	6	1
feb,09	210	352	-142	75	42	0	feb,10	222	420	-198	39	13	4
mar,09	204	447	-243	33	10	1	mar,10	205	428	-223	33	34	3
apr,09	200	433	-233	54	38	0	apr,10	185	377	-192	74	23	2
mai,09	212	388	-176	125	21	4	mai,10	209	390	-181	108	31	1
iun,09	223	344	-121	126	12	0	iun,10	260	366	-106	60	12	5
iul,09	284	338	-54	220	11	1	iul,10	233	344	-111	208	19	3
aug,09	271	310	-39	241	40	5	aug,10	269	338	-69	178	19	5
sept,09	257	310	-53	219	18	4	sept,10	234	329	-95	171	23	2
oct,09	287	404	-117	198	2	1	oct,10	216	374	-158	121	5	1
nov,09	243	407	-164	83	14	3	nov,10	220	360	-140	57	28	3
dec,09	225	438	-213	34	5	1	dec,10	183	412	-229	18	18	3

Source: INSSE

Table 117. The natural movement of Giurgiu County population during 2011-2012

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,11	215	394	-179	27	1	2	ian,12	210	368	-158	36	5	1
feb,11	172	398	-226	41	13	3	feb,12	202	468	-266	26	13	1
mar,11	219	424	-205	29	45	7	mar,12	193	414	-221	32	9	1
apr,11	186	369	-183	47	26	0	apr,12	182	342	-160	66	57	3
mai,11	233	347	-114	66	34	1	mai,12	204	331	-127	105	15	3
iun,11	203	304	-101	115	22	2	iun,12	215	329	-114	115	23	6
iul,11	253	324	-71	200	3	2	iul,12	247	399	-152	165	26	2
aug,11	258	310	-52	160	50	6	aug,12	259	323	-64	188	26	2
sept,11	234	287	-53	164	27	2	sept,12	241	303	-62	206	11	4
oct,11	192	334	-142	120	10	1	oct,12	248	360	-112	105	28	2
nov,11	207	394	-187	40	34	3	nov,12	200	378	-178	69	23	4
dec,11	248	385	-137	32	29	1	dec,12	174	410	-236	25	47	1

Source: INSSE

Table 118. The natural movement of Giurgiu County population during 2013-2014

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,13	227	388	-161	31	10	2	ian,14	258	385	-127	24	5	6
feb,13	163	351	-188	41	35	2	feb,14	184	391	-207	30	10	1
mar,13	172	382	-210	58	26	1	mar,14	191	432	-241	32	13	2
apr,13	180	394	-214	25	21	2	apr,14	179	342	-163	53	10	1
mai,13	205	335	-130	87	23	1	mai,14	157	348	-191	104	16	1
iun,13	184	335	-151	123	32	0	iun,14	167	318	-151	103	11	1
iul,13	224	326	-102	138	6	3	iul,14	219	332	-113	197	17	3
aug,13	234	310	-76	197	28	5	aug,14	203	306	-103	258	11	5
sept,13	224	305	-81	180	30	1	sept,14	242	277	-35	187	11	2
oct,13	229	358	-129	95	10	1	oct,14	208	363	-155	130	14	6
nov,13	188	367	-179	56	12	2	nov,14	159	335	-176	71	13	1
dec,13	173	409	-236	39	16	1	dec,14	175	380	-205	38	15	0

Source: INSSE

Table 119. The population trends of Giurgiu County during 2007-2014

Year	Population	Year	Population
2007	287259	2011	283254
2008	286040	2012	282156
2009	285491	2013	281079
2010	284198	2014	279393

Source: INSSE

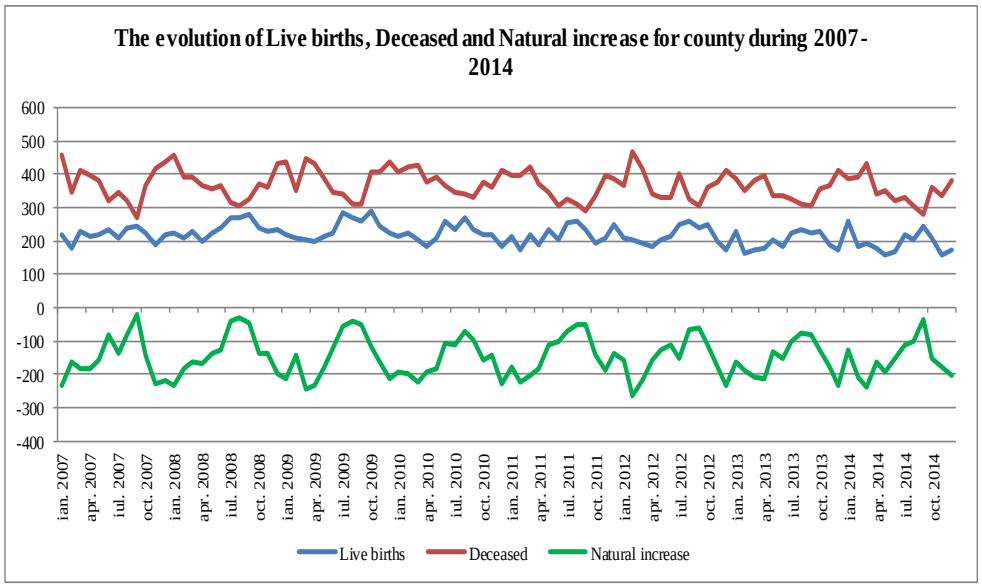


Figure 210

From figure 210 we can see a sinusoidal evolution of the indicator. #VALUE!

Regression analysis relative to indicator "Live births" gives us an equation: y=-0.37329083x+235.6046053 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Deceased" gives us an equation: y=-0.33113809x+382.820614 where x is the number of month (Jan, 2007=1), therefore a downward trend.

Regression analysis relative to indicator "Natural increase" gives us an equation: y=-0.04215274x+-147.2160088 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Live births" is 219, for "Deceased" is 366 and for "Natural increase": -157. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births": (157,199.25,219,235,287), for "Deceased": (268,333.5,366,395.75,468) and for "Natural increase": (-266,-192.25,-156.5,-111.75,-22).

The arithmetic mean and the standard deviation for "Live births" are: (218,29.44), for "Deceased": (367,44.03) and for "Natural increase": (-149,59.1). This means that with a probability greather than 0.68 "Live births" are in the range [189,247], for "Deceased" in [323,411] and for "Natural increase" in [-208,-90].

Percentiles length indicators analysis (Figure 211) show that, indeed the concentration is around the middle of the data.

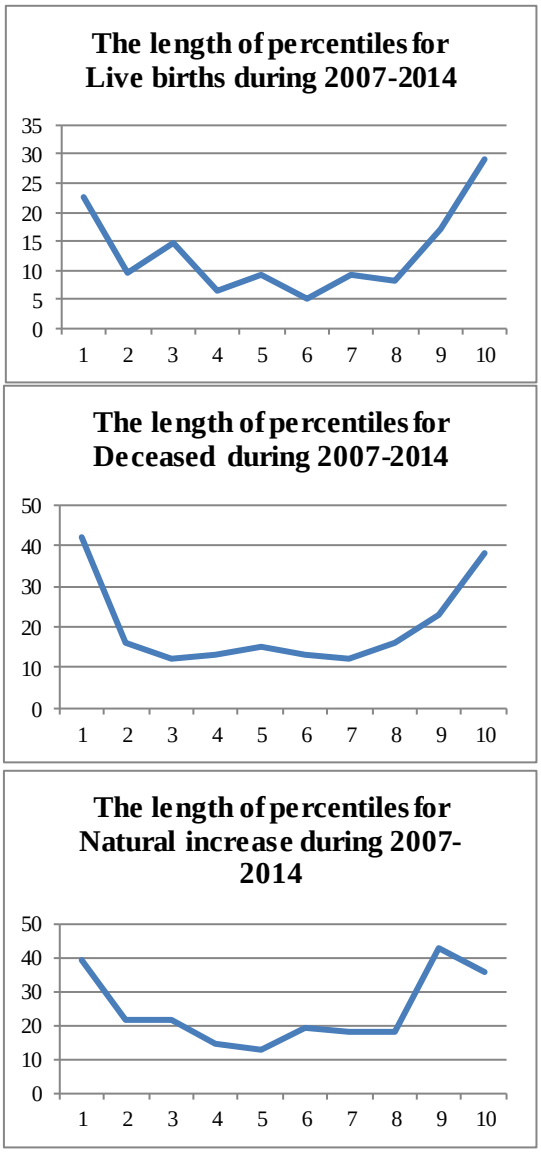


Figure 211

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Live births/10000 inh., Deceased/10000 inh. and Natural increase/10000 inh. as in the figure 212.

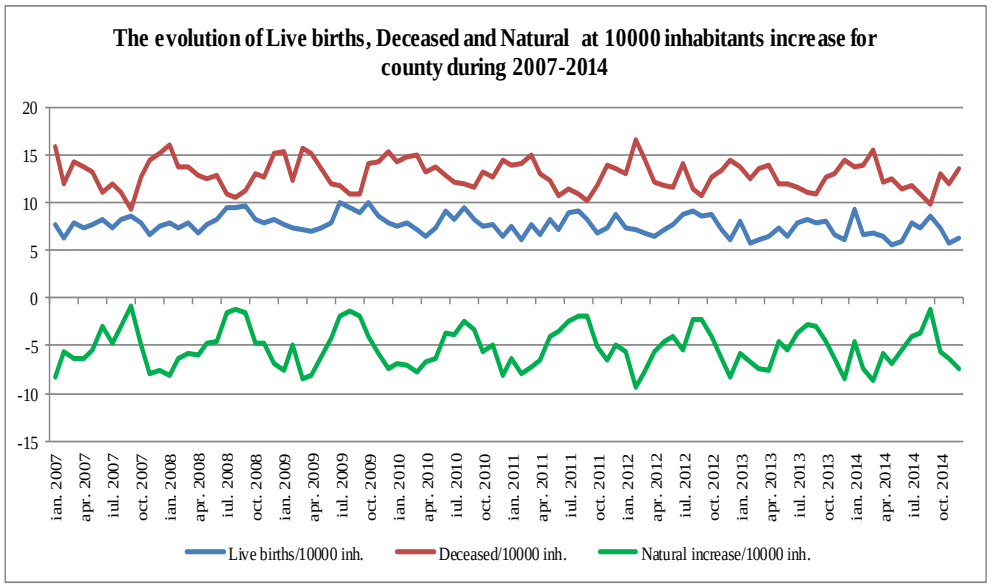


Figure 212

Regression analysis relative to indicator "Live births/10000 inh." gives us an equation: y=-0.010833288x+8.191872807 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Deceased/10000 inh." gives us an equation: y=-0.007682922x+13.30314254 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Natural increase/10000 inh." gives us an equation: y=-0.003160472x+-5.111508772 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Live births/10000 inh." is 8, for "Deceased/10000 inh." is 13 and for "Natural increase/10000 inh.": -6. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births/10000 inh.": (5.62,6.98,7.64,8.2675,10.05), for "Deceased/10000 inh.": (9.33,11.8275,12.855,14.0275,16.59) and for "Natural increase/10000 inh.": (-9.43,-6.8025,-5.545,-3.955,-0.77).

The arithmetic mean and the standard deviation for "Live births/10000 inh." are: (8,1.02), for "Deceased/10000 inh.": (13,1.53) and for "Natural increase/10000 inh.": (-5,2.08). This means that with a probability greather than 0.68 "Live

births/10000 inh." are in the range [7,9], for "Deceased/10000 inh." in [11,15] and for "Natural increase/10000 inh." in [-7,-3].

Percentiles length indicators analysis (Figure 213) show that, indeed the concentration is around the middle of the data.

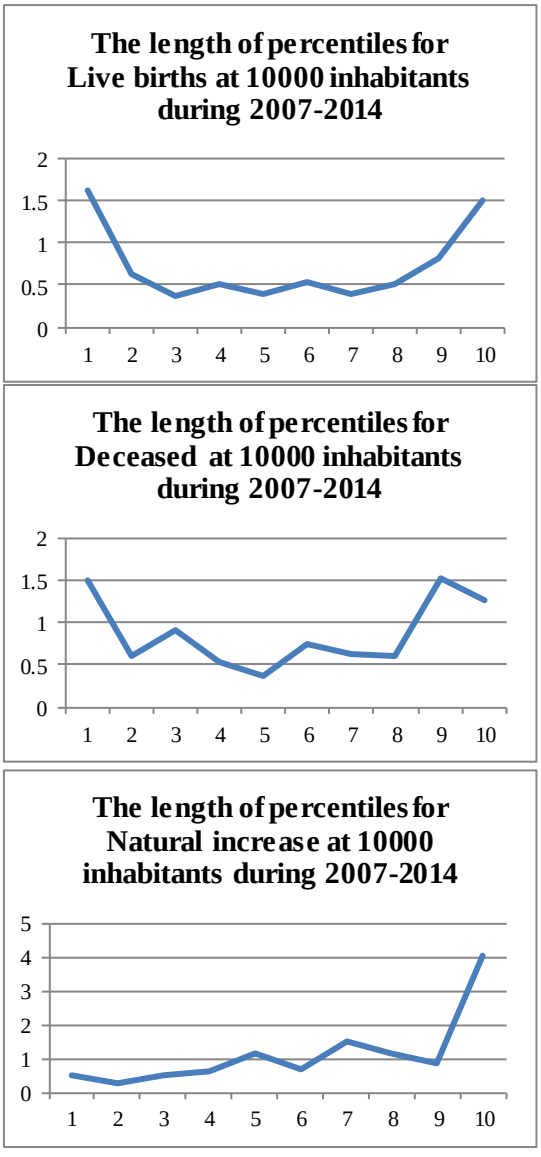


Figure 213

A comparison of the indicator "Live births" with the national level shows that it is about the same with the national, being better in 56.25% cases. For "Deceased" the indicator is worse than the national, being better only in 0% cases. Finally, for "Natural increase", the indicator is worse than the national, being better only in 0% cases.

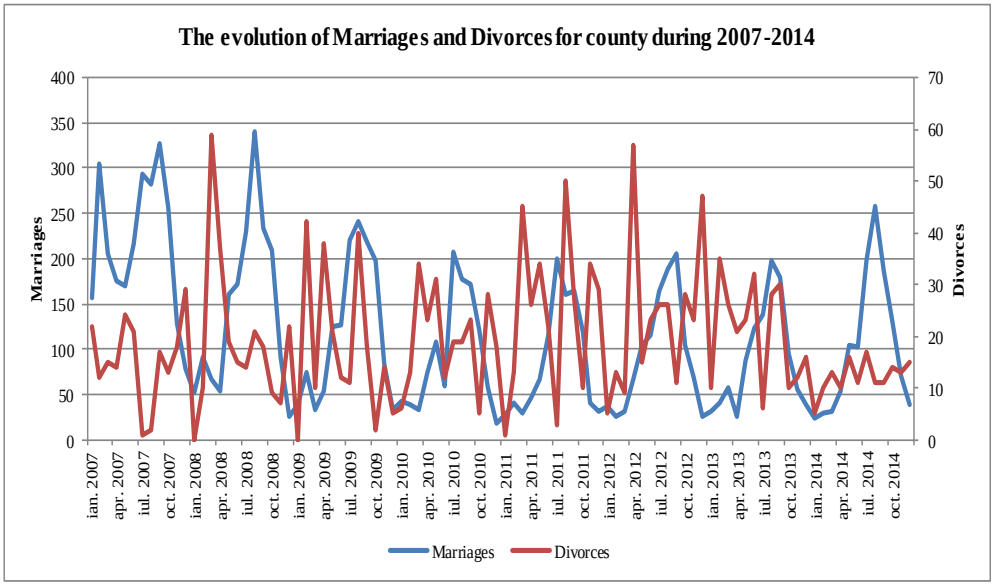


Figure 214

Regression analysis relative to indicator "Marriages" gives us an equation: y=-1.039982366x+168.6578947 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Divorces" gives us an equation: y=0.007358926x+18.75767544 where x is the number of month (Jan, 2007=1), therefore an upward trend.

For the set of values above, the median indicator for "Marriages" is 104 and for "Divorces" is 17. Also, the distribution of quartiles is for "Marriages": (18,41.75,103.5,178.5,340) and for "Divorces": (0,11,16.5,26,59). The arithmetic mean and the standard deviation for "Marriages" are: (118,81.31) and for "Divorces": (19,12.29). This means that with a probability greather than 0.68 "Marriages" are in the range [37,199] and for "Divorces" in [7,31].

Percentiles length indicators analysis (Figure 215) show that, indeed the concentration is around the middle of the data.

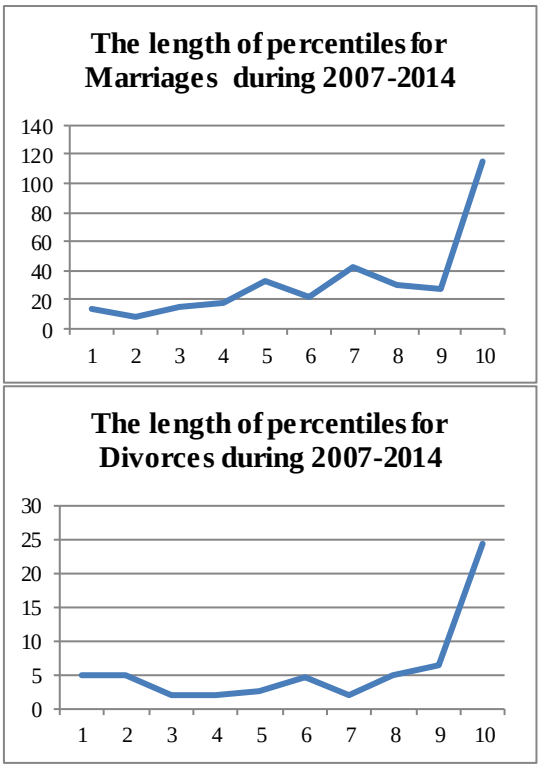


Figure 215

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Marriages/10000 inh. and Divorces/10000 inh. as in the figure 216.

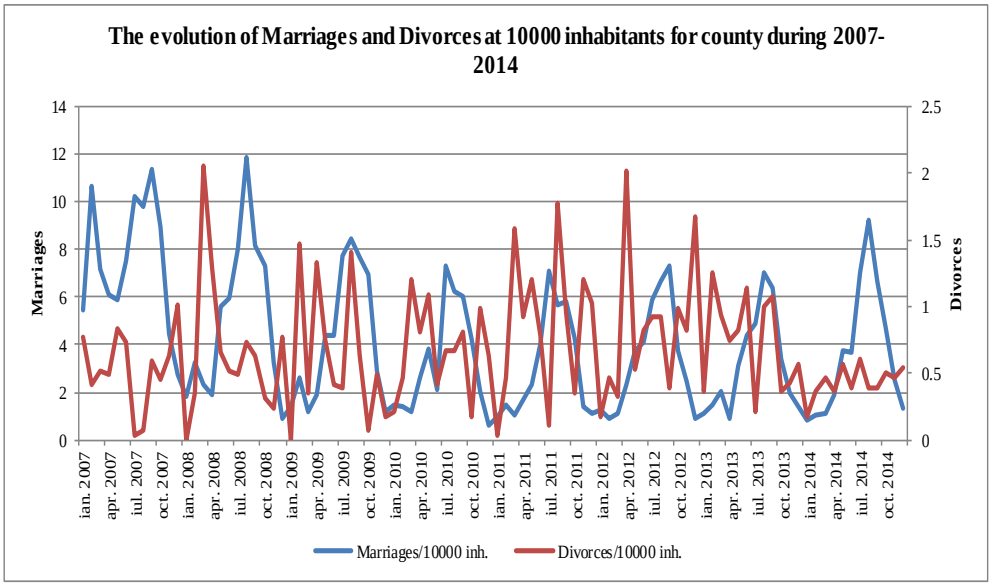


Figure 216

Regression analysis relative to indicator "Marriages/10000 inh." gives us an equation: y=-0.035155317x+5.865032895 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Divorces/10000 inh." gives us an equation: y=0.000461883x+0.652182018 where x is the number of month (Jan, 2007=1), therefore a very small upward trend.

For the set of values above, the median indicator for "Marriages/10000 inh." is 4 and for "Divorces/10000 inh." is 1. Also, the distribution of quartiles is for "Marriages/10000 inh.": (0.63,1.475,3.705,6.295,11.89) and for "Divorces/10000 inh.": (0,0.39,0.58,0.92,2.06). The arithmetic mean and the standard deviation for "Marriages/10000 inh." are: (4,2.84) and for "Divorces/10000 inh.": (1,0.43). This means that with a probability greather than 0.68 "Marriages/10000 inh." are in the range [1,7] and for "Divorces/10000 inh." in [1,1].

Percentiles length indicators analysis (Figure 217) show that, indeed the concentration is around the middle of the data.

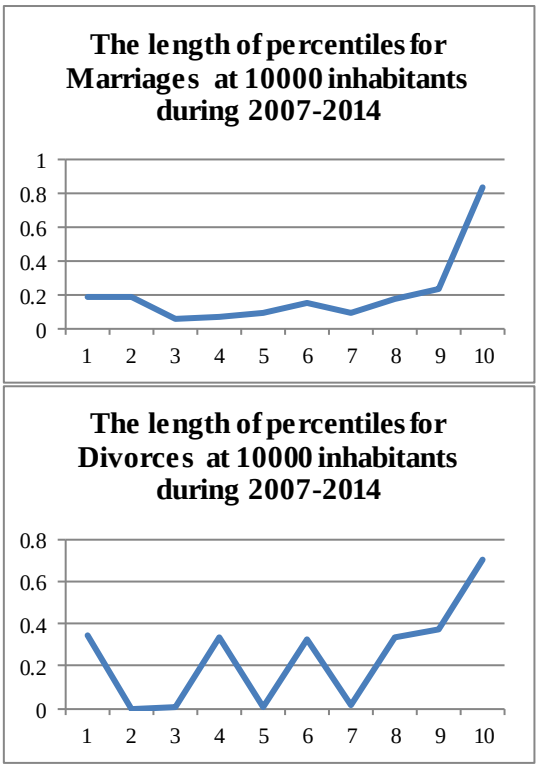


Figure 217

A comparison of the indicator "Marriages" with the national level shows that it is worse than the national, being better only in 17.71% cases. For "Divorces" the indicator is better than the national, being better in 87.5% cases.

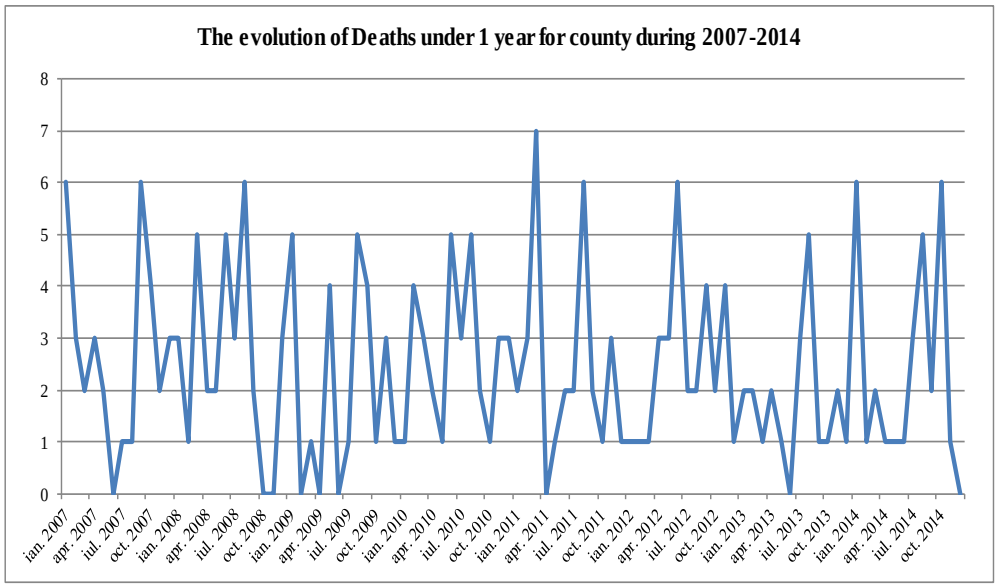


Figure 218

Regression analysis relative to indicator "Deaths under 1 year" gives us an equation: y=-0.00611096x+2.723464912 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Deaths under 1 year" is 2 and the distribution of quartiles is for "Deaths under 1 year": (0,1,2,3,7). The arithmetic mean and the standard deviation for "Deaths under 1 year" are: (2,1.75) which means that with a probability greather than 0.68 "Deaths under 1 year" are in the range [0,4]. Percentiles length indicators analysis (Figure 219) show that, indeed the concentration is around the middle of the data.

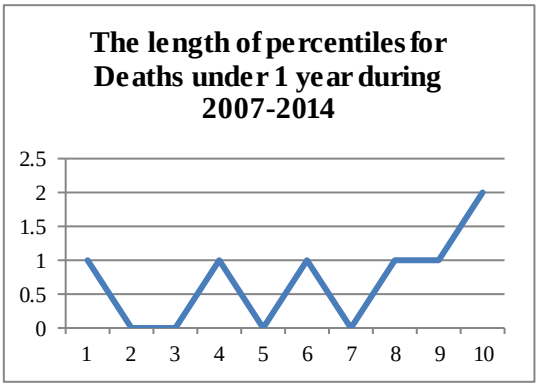


Figure 219

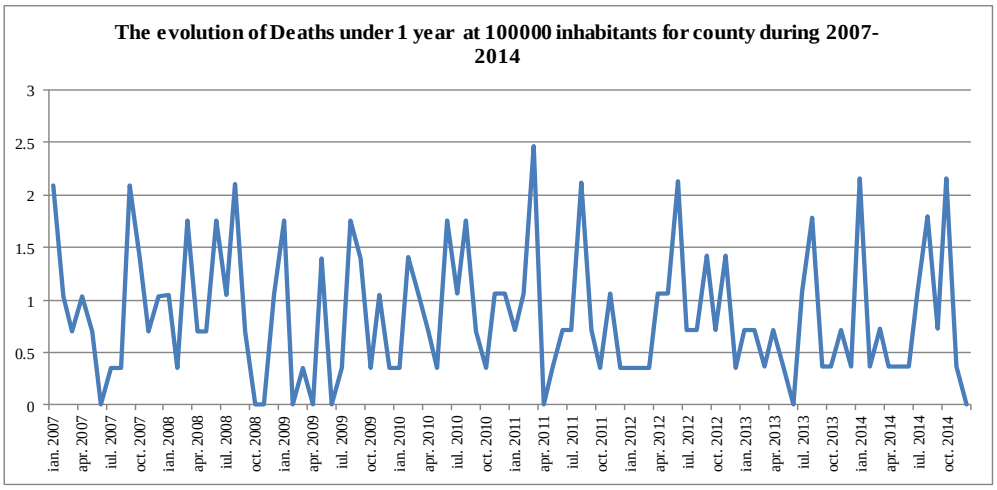


Figure 220

Regression analysis relative to indicator "Deaths under 1 year/100000 inh." gives us an equation: y=-0.001872694x+0.946763158 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Deaths under 1 year/100000 inh." is 1 and the distribution of quartiles is for "Deaths under 1 year/100000 inh.": (0,0.35,0.71,1.0625,2.47). The arithmetic mean and the standard deviation for "Deaths under 1 year/100000 inh." are: (1,0.62) which means that with a probability greather than 0.68 "Deaths under 1 year/100000 inh." are in the range [0,2]. A comparison of the indicator "Deaths under 1 year" with the national level shows that it is about the same with the national, being better in 48.96% cases. A final analysis examines dependence aforementioned indicators of regional GDP variation.

Table 120. The evolution of Giurgiu County GDP during 2007-2014

Year	GDP (in mil. lei 2007)	Variation (%)
2007	2711	-
2008	3137	15.74
2009	3245	3.43
2010	4158	28.12
2011	4016	-3.42
2012	3578	-10.89
2013	3190	-10.83
2014	4099	28.47

Source: INSSE and own calculations

In what follows, we shall investigate if there is a dependency between GDP variation (noted with dGDP) and the aforementioned indicators.

Searching dependence annual variations of "Live births" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Deceased" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Natural increase" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Marriages" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Divorces" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Deaths under 1 year" from GDP, we find that there is not a dependence of the variation of GDP.

2.21. Analysis of Natural Movement of Gorj County Population

Statistics of natural movement corresponding to Gorj County are the following:

Table 121. The natural movement of Gorj County population during 2007-2008

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,07	269	432	-163	283	57	1	ian,08	328	387	-59	110	10	1
feb,07	294	332	-38	370	59	1	feb,08	260	347	-87	126	20	0
mar,07	269	342	-73	221	74	2	mar,08	261	381	-120	99	26	2
apr,07	222	315	-93	306	42	2	apr,08	254	313	-59	72	42	1
mai,07	259	327	-68	237	46	6	mai,08	242	322	-80	262	18	2
iun,07	291	285	6	239	21	1	iun,08	251	329	-78	201	47	0
iul,07	352	300	52	254	30	1	iul,08	307	287	20	248	2	1
aug,07	295	273	22	330	20	3	aug,08	266	313	-47	416	46	2
sept,07	307	322	-15	342	10	5	sept,08	290	299	-9	282	55	3
oct,07	317	323	-6	313	20	4	oct,08	306	340	-34	301	15	0
nov,07	240	387	-147	167	0	4	nov,08	259	325	-66	157	19	1
dec,07	268	402	-134	114	0	4	dec,08	282	386	-104	91	17	3

Source: INSSE

Table 122. The natural movement of Gorj County population during 2009-2010

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,09	284	370	-86	91	47	3	ian,10	269	389	-86	106	28	3
feb,09	246	340	-94	108	38	8	feb,10	242	397	-164	88	28	2
mar,09	234	401	-167	79	35	4	mar,10	295	362	-67	70	41	1
apr,09	229	342	-113	142	55	1	apr,10	236	359	-123	186	18	0
mai,09	241	312	-71	263	56	5	mai,10	261	356	-95	218	32	1
iun,09	271	353	-82	181	113	5	iun,10	265	352	-87	87	27	3
iul,09	313	305	8	245	40	7	iul,10	281	317	-36	260	51	6
aug,09	295	279	16	382	109	3	aug,10	326	344	-18	339	62	1
sept,09	302	316	-14	313	54	2	sept,10	248	329	-81	298	30	5
oct,09	298	374	-76	300	10	5	oct,10	243	323	-80	280	24	2
nov,09	265	384	-119	137	19	2	nov,10	239	383	-144	76	16	2
dec,09	256	405	-149	63	52	2	dec,10	228	382	-154	58	58	3

Source: INSSE

Table 123. The natural movement of Gorj County population during 2011-2012

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,11	245	352	-107	101	12	1	ian,12	261	401	-140	87	18	2
feb,11	218	355	-137	61	29	1	feb,12	222	383	-161	45	38	3
mar,11	225	402	-177	70	46	2	mar,12	225	436	-211	40	46	4
apr,11	208	330	-122	73	52	2	apr,12	210	350	-140	155	77	5
mai,11	234	338	-104	166	41	5	mai,12	254	342	-88	170	47	3
iun,11	214	344	-130	164	50	5	iun,12	238	327	-89	177	75	4
iul,11	281	291	-10	276	37	3	iul,12	283	321	-38	218	43	1
aug,11	328	304	24	351	20	3	aug,12	315	290	25	328	64	2
sept,11	281	298	-17	276	12	1	sept,12	253	288	-35	347	38	2
oct,11	221	342	-121	222	30	3	oct,12	252	321	-69	225	22	2
nov,11	229	351	-122	83	17	3	nov,12	225	310	-85	91	42	4
dec,11	223	414	-191	71	54	1	dec,12	211	378	-167	76	96	3

Source: INSSE

Table 124. The natural movement of Gorj County population during 2013-2014

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,13	261	409	-148	88	48	3	ian,14	225	379	-154	74	25	4
feb,13	198	331	-133	57	71	2	feb,14	217	389	-172	64	34	7
mar,13	206	311	-105	77	53	3	mar,14	209	389	-180	65	70	2
apr,13	201	343	-142	56	46	2	apr,14	207	338	-131	84	37	1
mai,13	199	317	-118	152	88	3	mai,14	195	340	-145	187	40	1
iun,13	211	305	-94	200	57	1	iun,14	202	333	-131	156	43	0
iul,13	247	318	-71	221	38	4	iul,14	249	335	-86	256	46	3
aug,13	297	284	13	407	60	2	aug,14	317	337	-20	444	48	3
sept,13	269	300	-31	261	16	1	sept,14	260	301	-41	258	41	1
oct,13	235	360	-125	233	48	2	oct,14	255	387	-132	229	44	2
nov,13	208	365	-157	96	43	2	nov,14	220	359	-139	90	80	3
dec,13	207	407	-200	71	57	2	dec,14	214	377	-163	74	63	3

Source: INSSE

Table 125. The population trends of Gorj County during 2007-2014

Year	Population	Year	Population
2007	382332	2011	377200
2008	381300	2012	375439
2009	380075	2013	373441
2010	378708	2014	371345

Source: INSSE

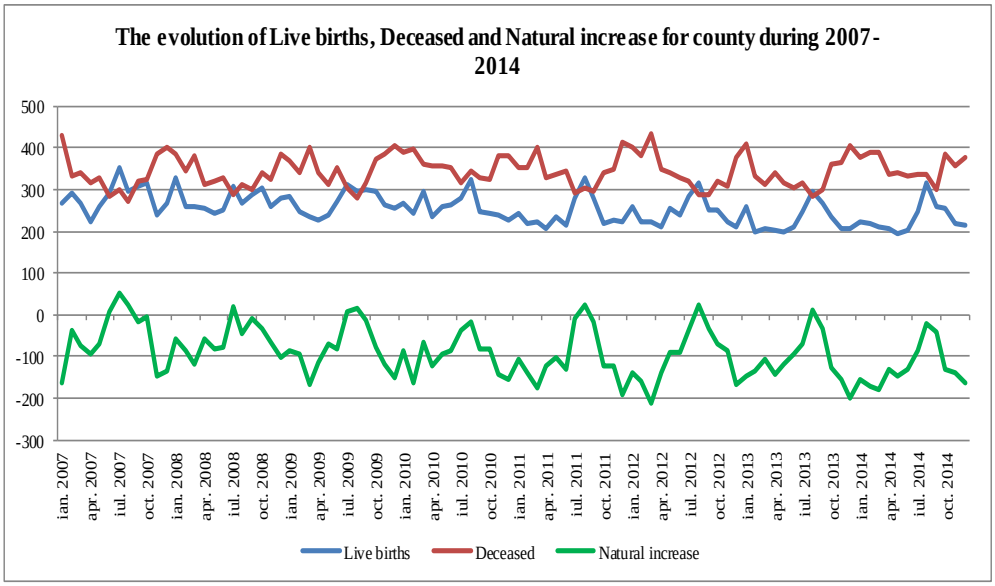


Figure 221

From figure 221 we can see a sinusoidal evolution of the indicator. Except months iun 2007, iul 2007, aug 2007, iul 2008, iul 2009, aug 2009, aug 2011, aug 2012, aug 2013 the natural increase was negative.

Regression analysis relative to indicator "Live births" gives us an equation: y=-0.649125068x+285.8679825 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Deceased" gives us an equation: y=0.089819588x+340.6958333 where x is the number of month (Jan, 2007=1), therefore an upward trend.

Regression analysis relative to indicator "Natural increase" gives us an equation: y=-0.74296663x+-54.37236842 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

For the set of values above, the median indicator for "Live births" is 253, for "Deceased" is 341 and for "Natural increase": -91. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births": (195,225,252.5,281,352), for "Deceased": (273,317,341,378.25,436) and for "Natural increase": (-211,-137.5,-91,-45.5,52).

The arithmetic mean and the standard deviation for "Live births" are: (254,36.02), for "Deceased": (345,37.36) and for "Natural increase": (-90,59.49). This means that with a probability greather than 0.68 "Live births" are in the range [218,290], for "Deceased" in [308,382] and for "Natural increase" in [-149,-31].

Percentiles length indicators analysis (Figure 222) show that, indeed the concentration is around the middle of the data.

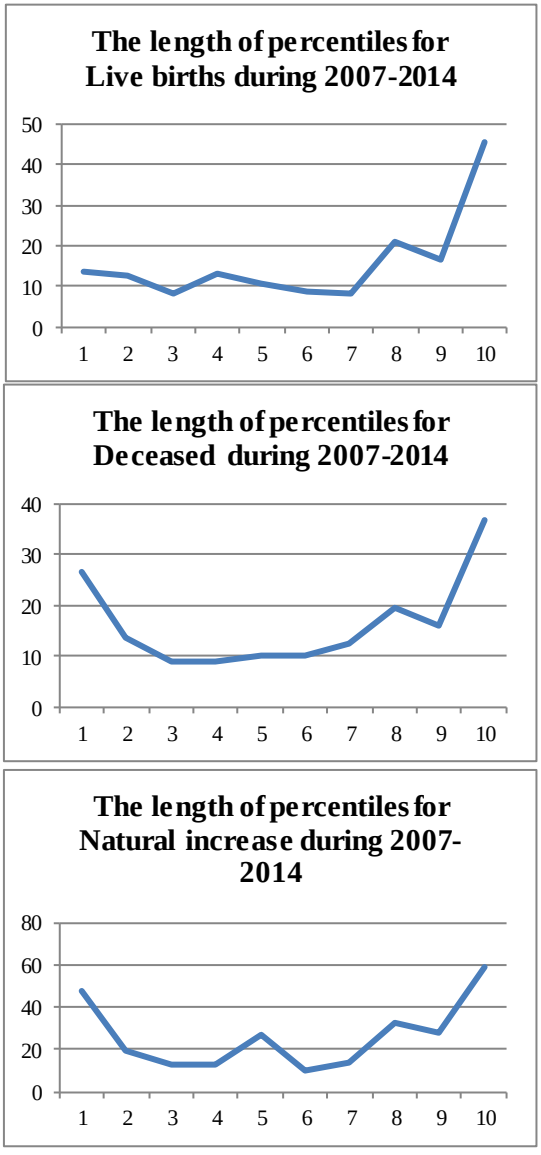


Figure 222

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Live births/10000 inh., Deceased/10000 inh. and Natural increase/10000 inh. as in the figure 223.

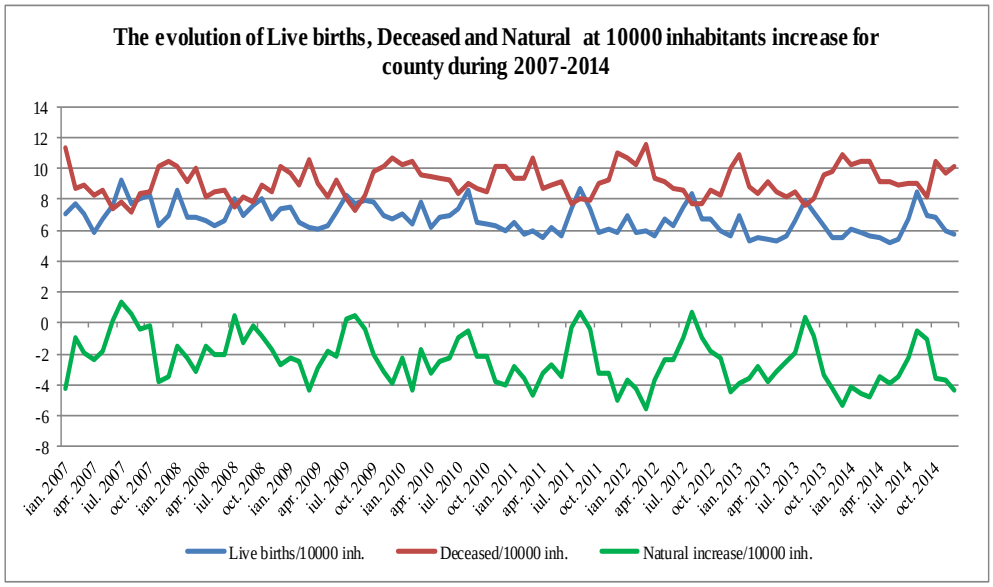


Figure 223

Regression analysis relative to indicator "Live births/10000 inh." gives us an equation: y=-0.014935567x+7.459583333 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Deceased/10000 inh." gives us an equation: y=0.005505901x+8.875359649 where x is the number of month (Jan, 2007=1), therefore an upward trend. Regression analysis relative to indicator "Natural increase/10000 inh." gives us an equation: y=-0.020502035x+-1.406067982 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Live births/10000 inh." is 7, for "Deceased/10000 inh." is 9 and for "Natural increase/10000 inh.": -2. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this. Also, the distribution of quartiles is for "Live births/10000 inh.": (5.25,5.985,6.71,7.4275,9.21), for "Deceased/10000 inh.": (7.14,8.4075,9.075,10.075,11.61) and for "Natural increase/10000 inh.": (-5.62,-3.655,-2.4,-1.1975,1.36).

The arithmetic mean and the standard deviation for "Live births/10000 inh." are: (7,0.92), for "Deceased/10000 inh.": (9,1) and for "Natural increase/10000 inh.": (-

2,1.58). This means that with a probability greather than 0.68 “Live births/10000 inh.” are in the range [6,8], for “Deceased/10000 inh.” in [8,10] and for “Natural increase/10000 inh.” in [-4,0]. Percentiles length indicators analysis (Figure 224) show that, indeed the concentration is around the middle of the data.

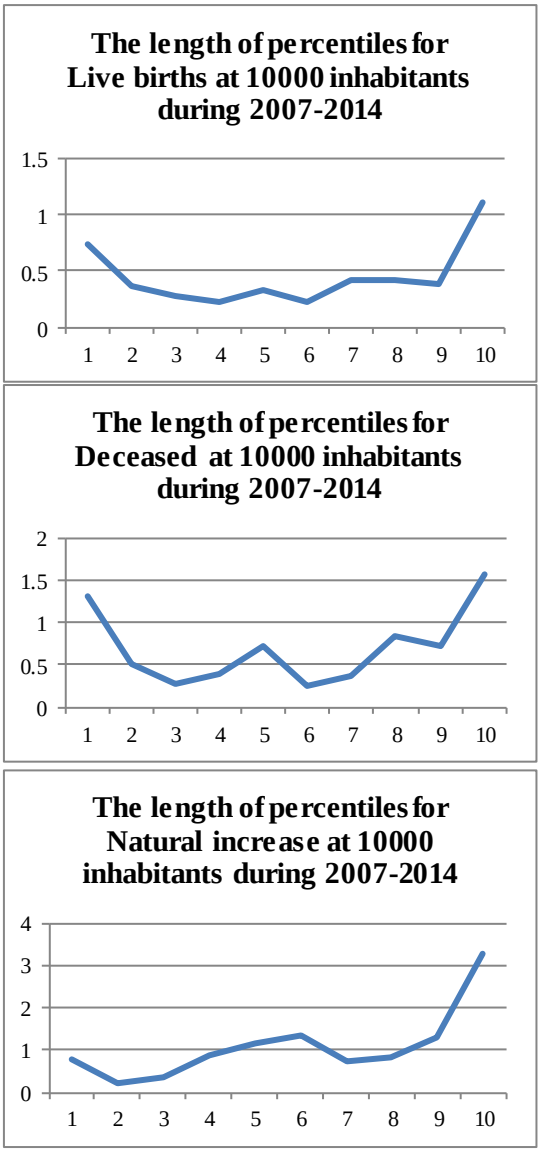


Figure 224

A comparison of the indicator "Live births" with the national level shows that it is worse than the national, being better only in 6.25% cases. For "Deceased" the indicator is better than the national, being better in 63.54% cases. Finally, for "Natural increase", the indicator is worse than the national, being better only in 18.75% cases.

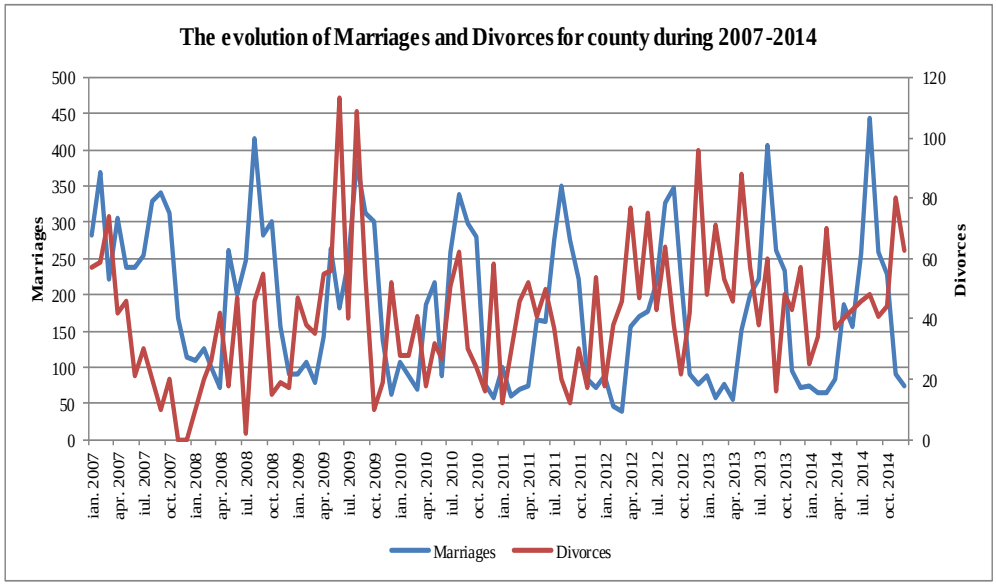


Figure 225

Regression analysis relative to indicator "Marriages" gives us an equation: y=-0.843298969x+225.1083333 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Divorces" gives us an equation: y=0.222497287x+30.26096491 where x is the number of month (Jan, 2007=1), therefore an upward trend.

For the set of values above, the median indicator for "Marriages" is 169 and for "Divorces" is 42. Also, the distribution of quartiles is for "Marriages": (40,87,168.5,261.25,444) and for "Divorces": (0,23.5,41.5,53.25,113). The arithmetic mean and the standard deviation for "Marriages" are: (184,103.69) and for "Divorces": (41,22.04). This means that with a probability greather than 0.68 "Marriages" are in the range [80,288] and for "Divorces" in [19,63].

Percentiles length indicators analysis (Figure 226) show that, indeed the concentration is around the middle of the data.

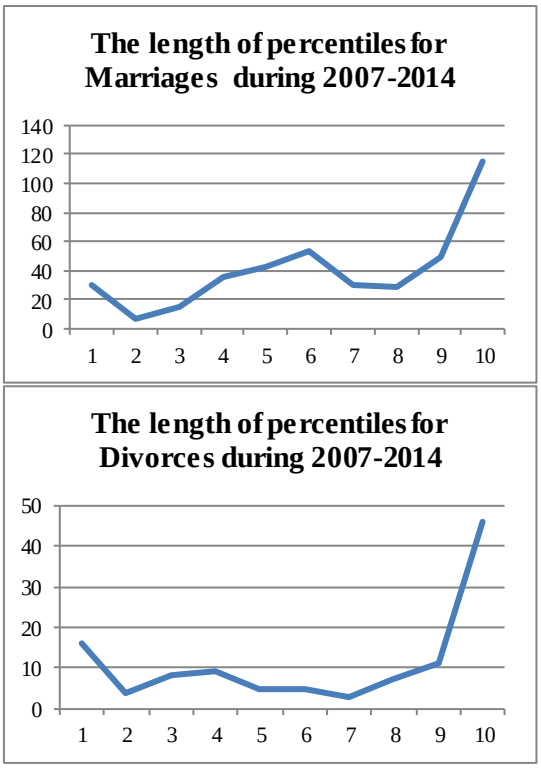


Figure 226

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Marriages/10000 inh. and Divorces/10000 inh. as in the figure 227.

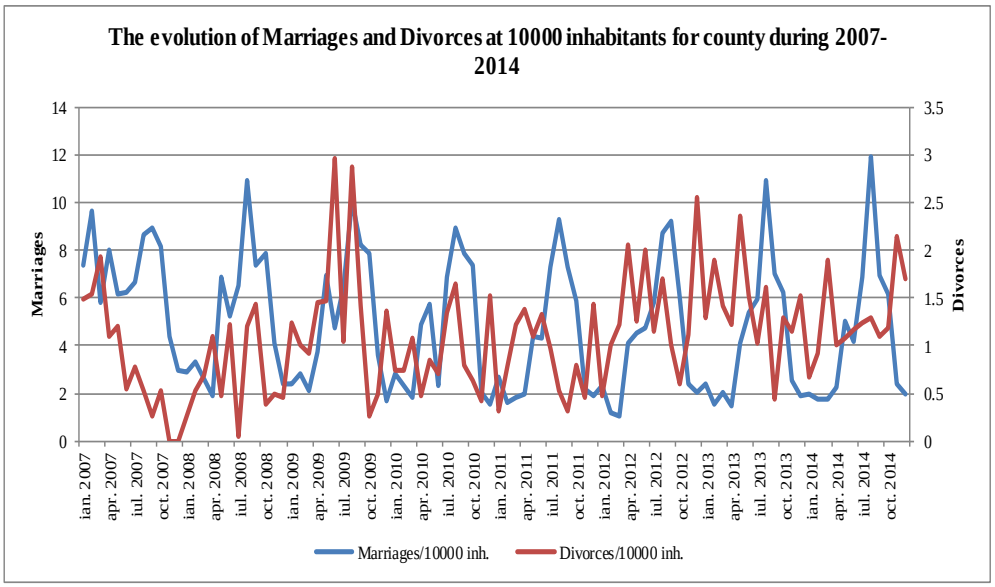


Figure 227

Regression analysis relative to indicator "Marriages/10000 inh." gives us an equation: y=-0.020551953x+5.87135307 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Divorces/10000 inh." gives us an equation: y=0.00630331x+0.783664474 where x is the number of month (Jan, 2007=1), therefore an upward trend.

For the set of values above, the median indicator for "Marriages/10000 inh." is 4 and for "Divorces/10000 inh." is 1. Also, the distribution of quartiles is for "Marriages/10000 inh.": (1.07,2.315,4.465,6.9275,11.96) and for "Divorces/10000 inh.": (0,0.62,1.1,1.42,2.97). The arithmetic mean and the standard deviation for "Marriages/10000 inh." are: (5,2.74) and for "Divorces/10000 inh.": (1,0.59). This means that with a probability greather than 0.68 "Marriages/10000 inh." are in the range [2,8] and for "Divorces/10000 inh." in [0,2].

Percentiles length indicators analysis (Figure 228) show that, indeed the concentration is around the middle of the data.

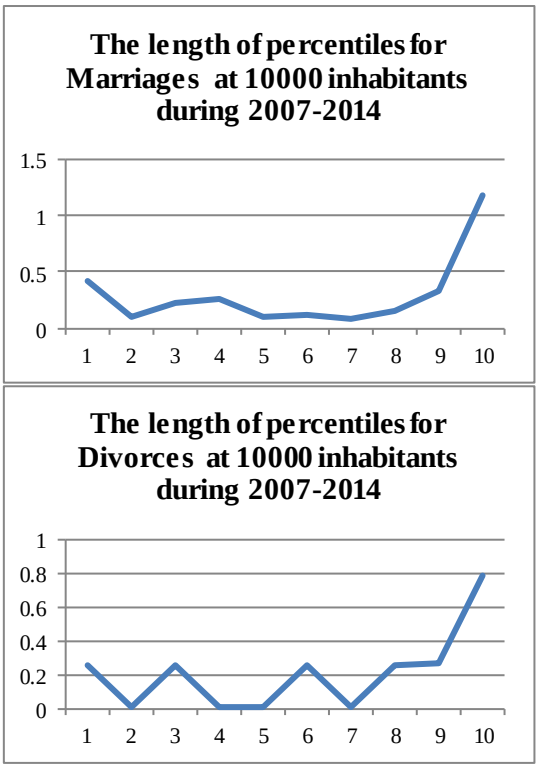


Figure 228

A comparison of the indicator "Marriages" with the national level shows that it is about the same with the national, being better in 57.29% cases. For "Divorces" the indicator is about the same with the national, being better in 53.13% cases.

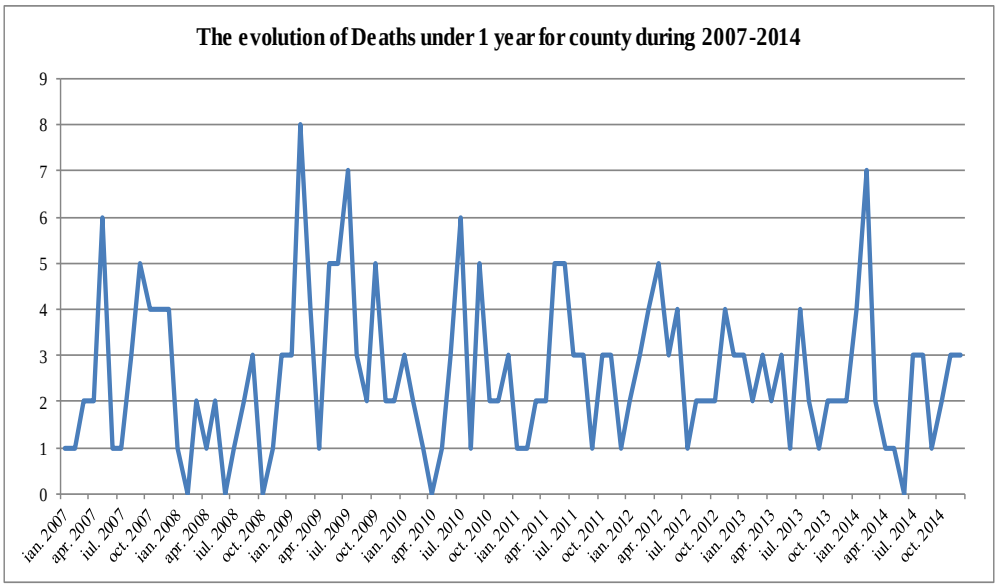


Figure 229

Regression analysis relative to indicator "Deaths under 1 year" gives us an equation: y=-0.000501899x+2.607675439 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Deaths under 1 year" is 2 and the distribution of quartiles is for "Deaths under 1 year": (0,1,2,3,8). The arithmetic mean and the standard deviation for "Deaths under 1 year" are: (3,1.64) which means that with a probability greather than 0.68 "Deaths under 1 year" are in the range [1,5]. Percentiles length indicators analysis (Figure 230) show that, indeed the concentration is around the middle of the data.

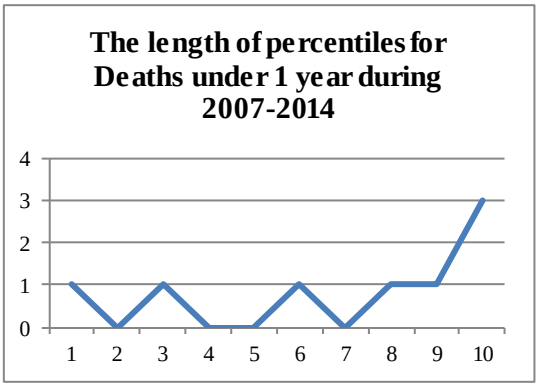


Figure 230

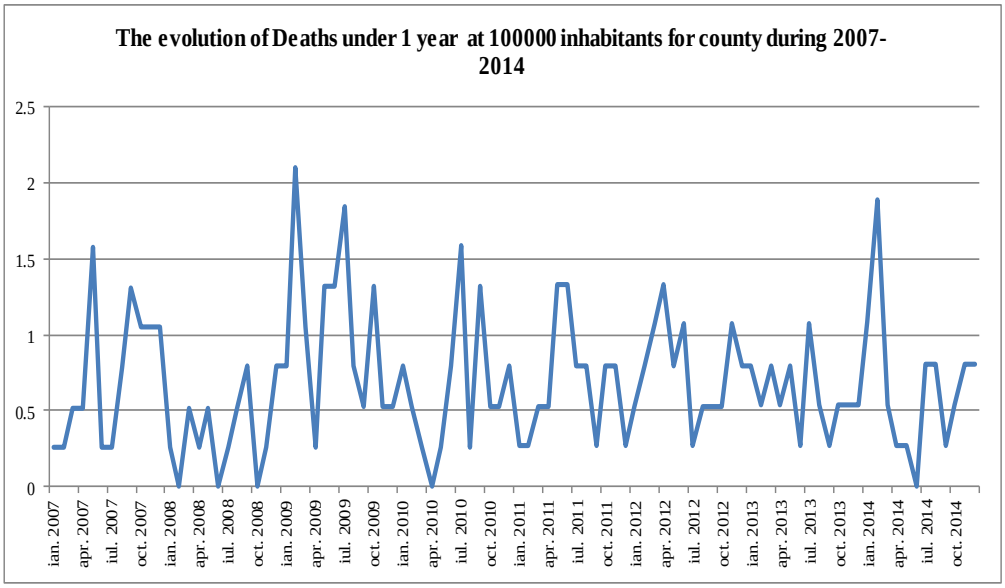


Figure 231

Regression analysis relative to indicator "Deaths under 1 year/100000 inh." gives us an equation: y=0.000124322x+0.679074561 where x is the number of month (Jan, 2007=1), therefore a very small upward trend. For the set of values above, the median indicator for "Deaths under 1 year/100000 inh." is 1 and the distribution of quartiles is for "Deaths under 1 year/100000 inh.": (0,0.27,0.54,0.81,2.1). The arithmetic mean and the standard deviation for "Deaths under 1 year/100000 inh." are: (1,0.43) which means that with a probability greather than 0.68 "Deaths under 1 year/100000 inh." are in the range [1,1]. A comparison of the indicator "Deaths under 1 year" with the national level shows that it is better than the national, being better in 60.42% cases. A final analysis examines dependence aforementioned indicators of regional GDP variation.

Table 126. The evolution of Gorj County GDP during 2007-2014

Year	GDP (in mil. lei 2007)	Variation (%)
2007	7340	-
2008	7050	-3.95
2009	7332	4
2010	7650	4.34
2011	7671	0.27
2012	7502	-2.21
2013	7495	-0.09
2014	6787	-9.45

Source: INSSE and own calculations

In what follows, we shall investigate if there is a dependency between GDP variation (noted with dGDP) and the aforementioned indicators.

Searching dependence annual variations of "Live births" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Deceased" from GDP, we find that there is a dependence of Deceased from GDP offset by 2 years and the regression equation is:-0.6881dGDP+0.7852. Searching dependence annual variations of "Natural increase" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Marriages" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Divorces" from GDP, we find that there is a dependence of Divorces from GDP offset by 1 year and the regression equation is:-10.5197dGDP+21.9011. Searching dependence annual variations of "Deaths under 1 year" from GDP, we find that there is a dependence of Deaths under 1 year from GDP offset by 1 year and the regression equation is:-16.7775dGDP+33.9025.

2.22. Analysis of natural movement of Harghita County population

Statistics of natural movement corresponding to Harghita County are the following:

Table 127. The natural movement of Harghita County population during 2007-2008

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,07	322	352	-30	102	34	5	ian,08	347	323	24	59	14	4
feb,07	253	307	-54	302	34	4	feb,08	294	318	-24	74	35	3
mar,07	310	288	22	204	34	4	mar,08	288	355	-67	84	28	8
apr,07	263	296	-33	195	25	6	apr,08	305	306	-1	145	42	3
mai,07	324	316	8	222	37	4	mai,08	323	276	47	203	21	4
iun,07	304	278	26	205	40	2	iun,08	288	299	-11	163	43	3
iul,07	332	298	34	208	11	3	iul,08	370	266	104	212	13	0
aug,07	277	280	-3	286	14	0	aug,08	302	290	12	266	32	2
sept,07	339	280	59	239	27	2	sept,08	340	315	25	196	26	2
oct,07	279	289	-10	183	24	2	oct,08	315	315	0	161	28	8
nov,07	328	297	31	150	42	6	nov,08	251	285	-34	116	27	4
dec,07	301	321	-20	107	42	2	dec,08	328	374	-46	66	22	1

Source: INSSE

Table 128. The natural movement of Harghita County population during 2009-2010

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,09	325	351	-26	55	11	5	ian,10	306	318	-12	67	5	5
feb,09	260	288	-28	75	33	1	feb,10	292	307	-15	86	33	4
mar,09	306	358	-52	53	23	3	mar,10	321	288	33	73	32	2
apr,09	304	316	-12	119	17	3	apr,10	283	286	-3	132	34	2
mai,09	267	336	-69	172	41	4	mai,10	297	359	-62	184	51	2
iun,09	317	290	27	140	39	2	iun,10	319	309	10	101	52	7
iul,09	312	278	34	237	40	2	iul,10	300	320	-20	230	21	4
aug,09	313	265	48	280	6	1	aug,10	303	263	40	234	17	2
sept,09	362	275	87	205	26	1	sept,10	283	273	10	151	33	4
oct,09	318	277	41	170	16	5	oct,10	272	294	-22	126	31	3
nov,09	249	310	-61	95	22	3	nov,10	293	304	-11	70	38	2
dec,09	322	323	-1	59	45	3	dec,10	289	327	-38	49	20	2

Source: INSSE

Table 129. The natural movement of Harghita County population during 2011-2012

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,11	271	334	-63	29	15	9	ian,12	278	339	-61	44	9	4
feb,11	266	289	-23	70	52	5	feb,12	258	332	-74	73	41	3
mar,11	256	329	-73	72	40	3	mar,12	259	342	-83	40	41	3
apr,11	248	312	-64	92	44	4	apr,12	227	267	-40	85	26	3
mai,11	292	279	13	150	55	5	mai,12	311	276	35	135	43	4
iun,11	264	280	-16	146	20	3	iun,12	265	309	-44	157	21	2
iul,11	278	287	-9	194	36	4	iul,12	305	273	32	150	24	2
aug,11	351	280	71	225	36	4	aug,12	317	281	36	197	29	3
sept,11	286	253	33	152	16	1	sept,12	280	242	38	166	25	3
oct,11	269	311	-42	109	24	3	oct,12	327	326	1	141	33	6
nov,11	277	286	-9	60	31	4	nov,12	245	259	-14	69	30	5
dec,11	223	313	-90	46	30	2	dec,12	271	307	-36	45	32	3

Source: INSSE

Table 130. The natural movement of Harghita County population during 2013-2014

Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year	Month	Live births	Deceased	Natural increase	Marriages	Divorces	Deaths under 1 year
ian,13	304	299	5	45	9	6	ian,14	265	321	-56	51	8	3
feb,13	251	280	-29	65	47	0	feb,14	255	270	-15	82	23	6
mar,13	221	322	-101	58	27	2	mar,14	265	336	-71	47	27	0
apr,13	272	307	-35	112	32	4	apr,14	265	303	-38	92	13	2
mai,13	263	263	0	129	36	0	mai,14	273	270	3	182	20	4
iun,13	270	269	1	158	30	2	iun,14	287	298	-11	144	24	2
iul,13	277	306	-29	186	16	1	iul,14	324	255	69	204	14	1
aug,13	314	223	91	214	21	1	aug,14	311	252	59	245	32	3
sept,13	316	238	78	157	19	2	sept,14	349	280	69	157	33	4
oct,13	312	290	22	105	35	2	oct,14	290	300	-10	110	20	2
nov,13	222	259	-37	81	27	2	nov,14	229	316	-87	76	36	1
dec,13	235	331	-96	54	37	2	dec,14	265	315	-50	43	27	2

Source: INSSE

Table 131. The population trends of Harghita County during 2007-2014

Year	Population	Year	Population
2007	338480	2011	336684
2008	338031	2012	336093
2009	337633	2013	335608
2010	337294	2014	335058

Source: INSSE

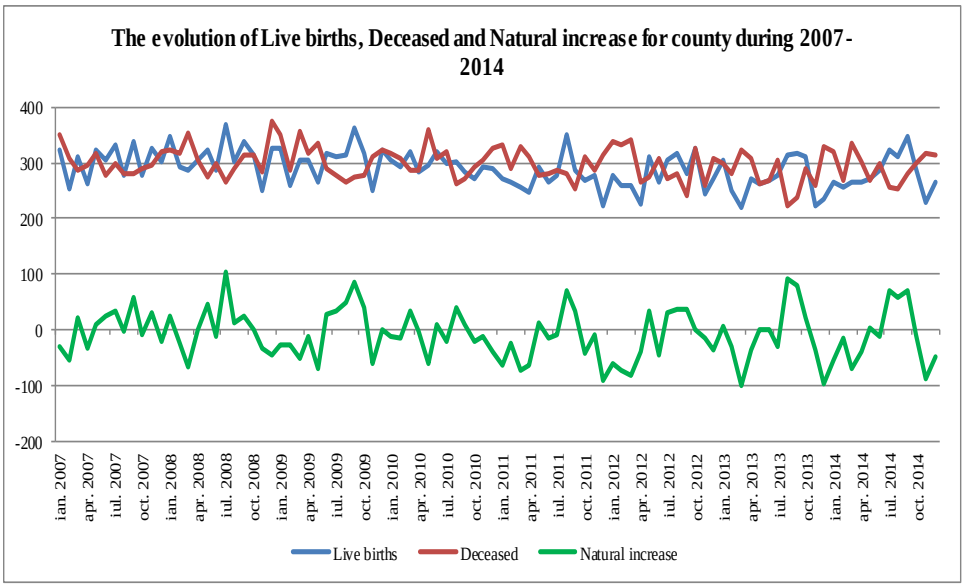


Figure 232

From figure 232 we can see a sinusoidal evolution of the indicator. Except months mar 2007, mai 2007, iun 2007, iul 2007, sept 2007, nov 2007, ian 2008, mai 2008, iul 2008, aug 2008, sept 2008, oct 2008, iun 2009, iul 2009, aug 2009, sept 2009, oct 2009, mar 2010, iun 2010, aug 2010, sept 2010, mai 2011, aug 2011, sept 2011, mai 2012, iul 2012, aug 2012, sept 2012, oct 2012, ian 2013, mai 2013, iun 2013, aug 2013, sept 2013, oct 2013, mai 2014, iul 2014, aug 2014, sept 2014 the natural increase was negative.

Regression analysis relative to indicator "Live births" gives us an equation: y=-0.435709441x+311.2881579 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Deceased" gives us an equation: y=-0.250935974x+310.5870614 where x is the number of month (Jan, 2007=1), therefore a downward trend.

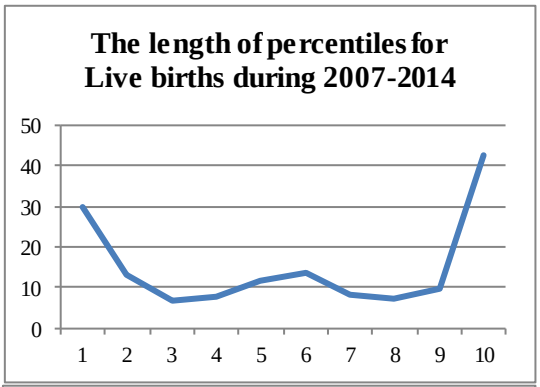
Regression analysis relative to indicator "Natural increase" gives us an equation: y=-0.184773467x+0.701096491 where x is the number of month (Jan, 2007=1), therefore a downward trend.

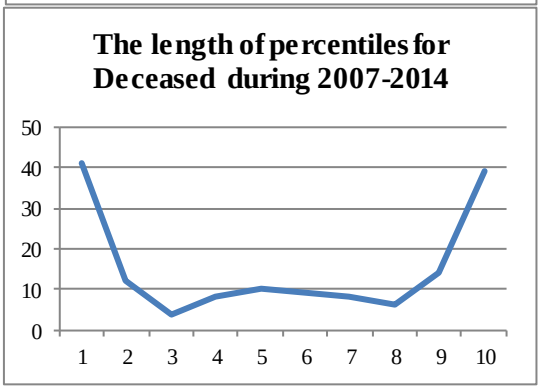
For the set of values above, the median indicator for "Live births" is 290, for "Deceased" is 298 and for "Natural increase": -11. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for “Live births”: (221,265,289.5,314.25,370), for “Deceased”: (223,278.75,298,316.5,374) and for “Natural increase”: (-101,-38,-11,25.25,104).

The arithmetic mean and the standard deviation for “Live births” are: (290,32.31), for “Deceased”: (298,28.75) and for “Natural increase”: (-8,44.79). This means that with a probability greather than 0.68 “Live births” are in the range [258,322], for “Deceased” in [269,327] and for “Natural increase” in [-53,37].

Percentiles length indicators analysis (Figure 233) show that, indeed the concentration is around the middle of the data.





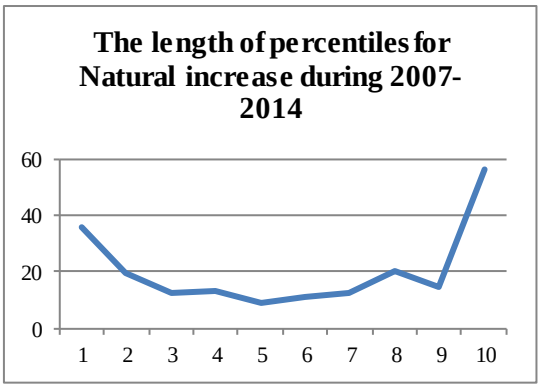


Figure 233

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Live births/10000 inh., Deceased/10000 inh. and Natural increase/10000 inh. as in the figure 234.

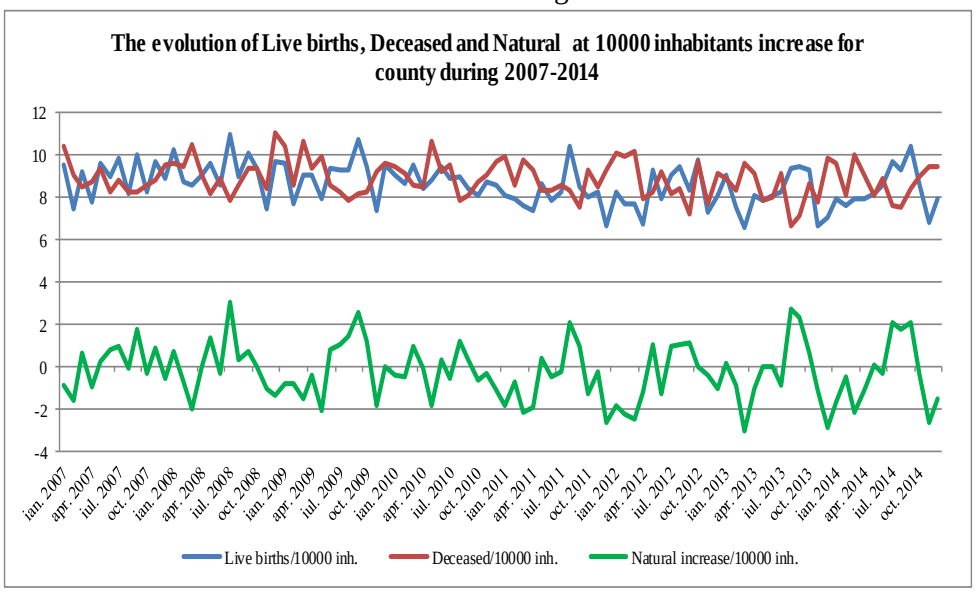


Figure 234

Regression analysis relative to indicator "Live births/10000 inh." gives us an equation: y=-0.011889175x+9.189125 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Deceased/10000 inh." gives us an equation: y=-0.006390871x+9.167769737 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Natural increase/10000 inh." gives us an equation: y=-0.005493896x+0.020620614 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Live births/10000 inh." is 9, for "Deceased/10000 inh." is 9 and for "Natural increase/10000 inh.": 0. This means that the probability that the indicator has a value less than the median is equal to the probability that it has a higher value than this.

Also, the distribution of quartiles is for "Live births/10000 inh.": (6.59,7.91,8.615,9.33,10.95), for "Deceased/10000 inh.": (6.64,8.26,8.825,9.415,11.06) and for "Natural increase/10000 inh.": (-3.01,-1.13,-0.33,0.7475,3.08).

The arithmetic mean and the standard deviation for "Live births/10000 inh." are: (9,0.95), for "Deceased/10000 inh.": (9,0.85) and for "Natural increase/10000 inh.": (0,1.33). This means that with a probability greather than 0.68 "Live births/10000 inh." are in the range [8,10], for "Deceased/10000 inh." in [8,10] and for "Natural increase/10000 inh." in [-1,1].

Percentiles length indicators analysis (Figure 235) show that, indeed the concentration is around the middle of the data.

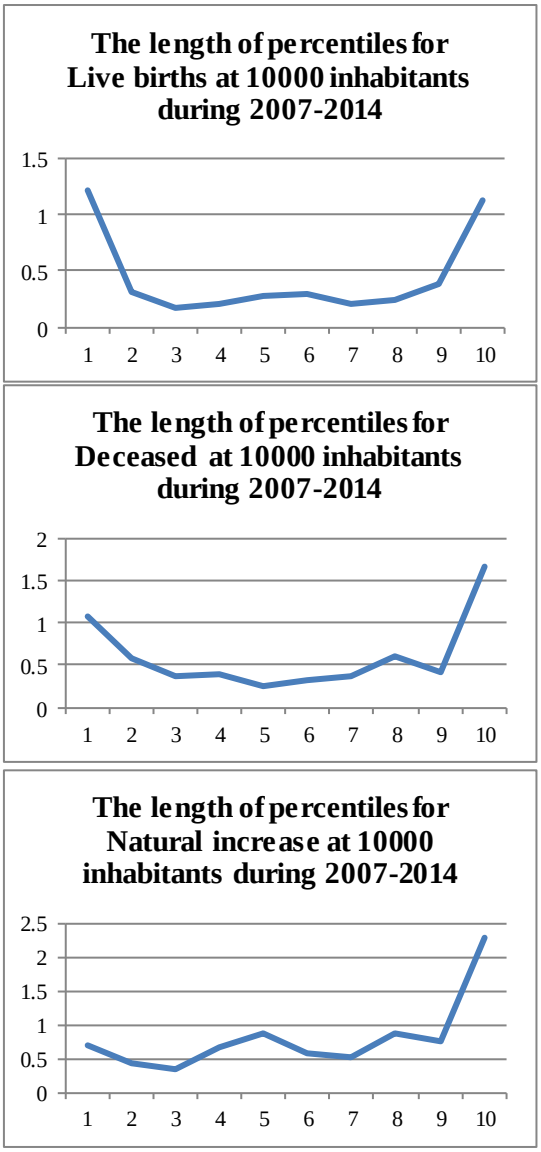


Figure 235

A comparison of the indicator "Live births" with the national level shows that it is better than the national, being better in 90.63% cases. For "Deceased" the indicator is better than the national, being better in 81.25% cases. Finally, for "Natural increase", the indicator is better than the national, being better in 95.83% cases.

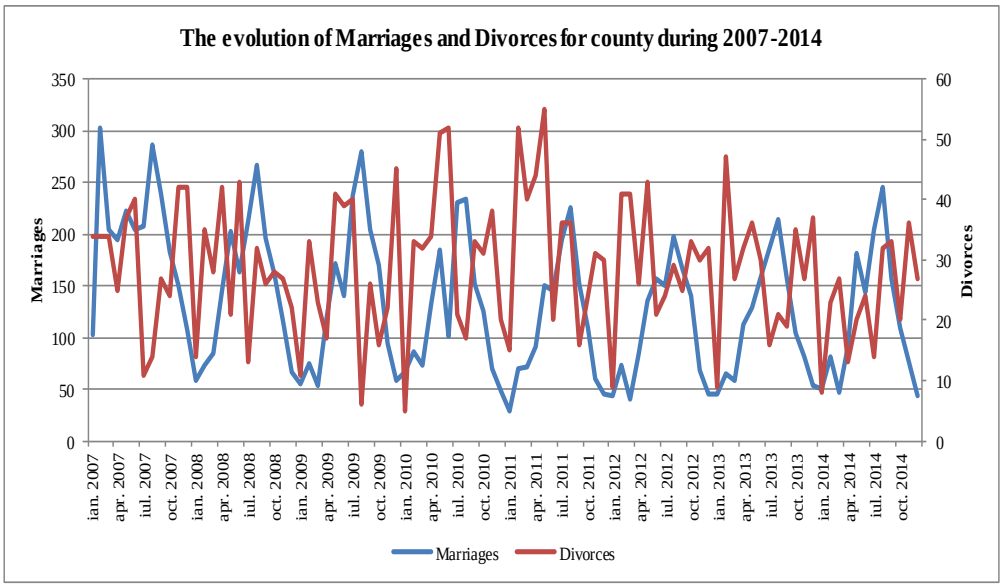


Figure 236

Regression analysis relative to indicator "Marriages" gives us an equation: y=-0.76123847x+169.7846491 where x is the number of month (Jan, 2007=1), therefore a pronounced downward trend.

Regression analysis relative to indicator "Divorces" gives us an equation: y=-0.033851058x+30.25635965 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Marriages" is 131 and for "Divorces" is 29. Also, the distribution of quartiles is for "Marriages": (29,72.75,130.5,184.5,302) and for "Divorces": (5,21,28.5,36,55). The arithmetic mean and the standard deviation for "Marriages" are: (133,67.01) and for "Divorces": (29,11.05). This means that with a probability greather than 0.68 "Marriages" are in the range [66,200] and for "Divorces" in [18,40].

Percentiles length indicators analysis (Figure 237) show that, indeed the concentration is around the middle of the data.

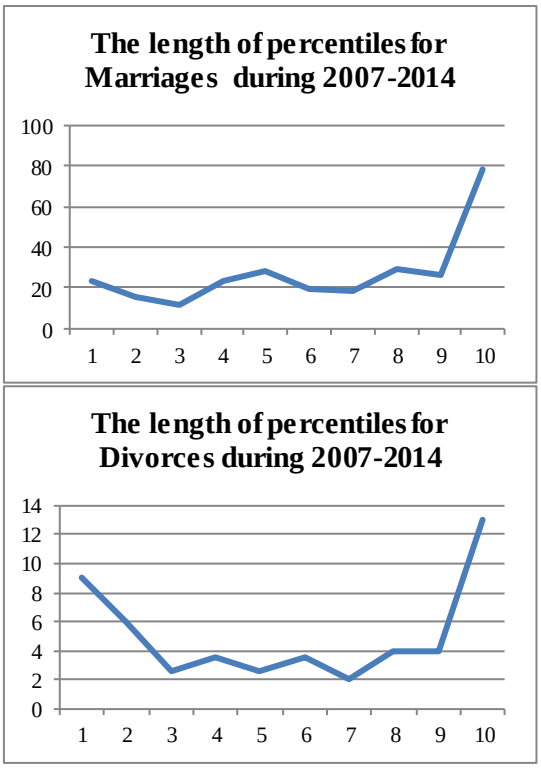


Figure 237

Taking into account the population dynamics during the analyzed period we have the following evolution of the indicators: Marriages/10000 inh. and Divorces/10000 inh. as in the figure 238.

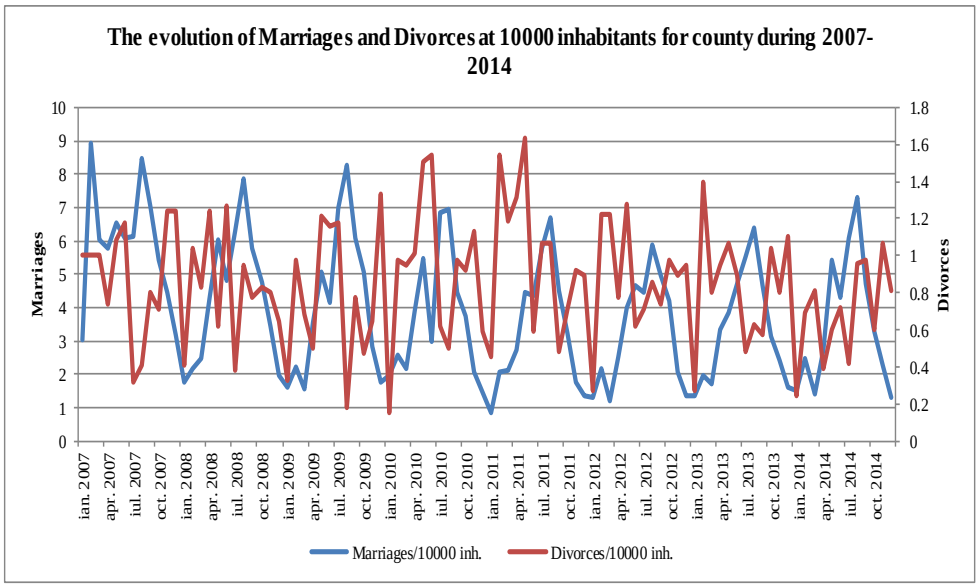


Figure 238

Regression analysis relative to indicator "Marriages/10000 inh." gives us an equation: y=-0.022079626x+5.013153509 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

Regression analysis relative to indicator "Divorces/10000 inh." gives us an equation: y=-0.000890464x+0.892041667 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Marriages/10000 inh." is 4 and for "Divorces/10000 inh." is 1. Also, the distribution of quartiles is for "Marriages/10000 inh.": (0.86,2.155,3.875,5.48,8.92) and for "Divorces/10000 inh.": (0.15,0.62,0.845,1.07,1.63). The arithmetic mean and the standard deviation for "Marriages/10000 inh." are: (4,1.98) and for "Divorces/10000 inh.": (1,0.33). This means that with a probability greather than 0.68 "Marriages/10000 inh." are in the range [2,6] and for "Divorces/10000 inh." in [1,1].

Percentiles length indicators analysis (Figure 239) show that, indeed the concentration is around the middle of the data.

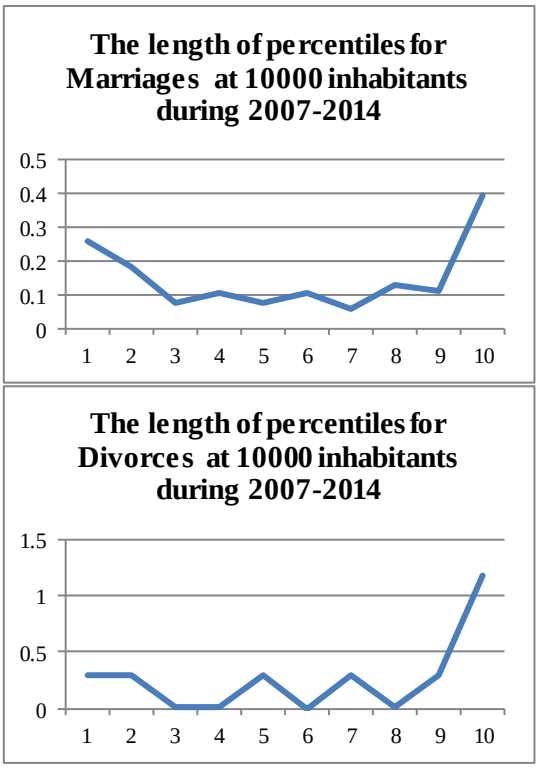


Figure 239

A comparison of the indicator "Marriages" with the national level shows that it is worse than the national, being better only in 25% cases. For "Divorces" the indicator is better than the national, being better in 81.25% cases.

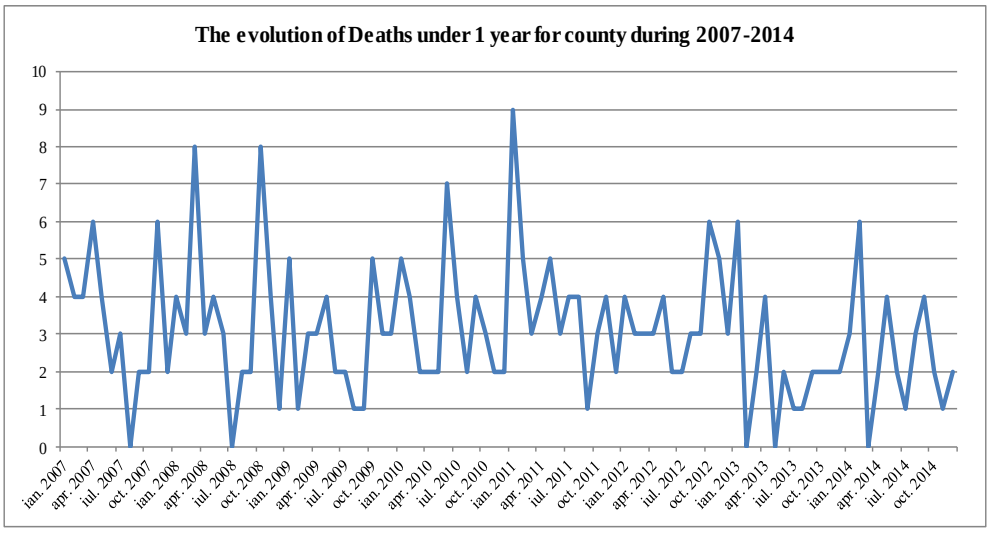


Figure 240

Regression analysis relative to indicator "Deaths under 1 year" gives us an equation: y=-0.012398264x+3.684649123 where x is the number of month (Jan, 2007=1), therefore a very small downward trend.

For the set of values above, the median indicator for "Deaths under 1 year" is 3 and the distribution of quartiles is for "Deaths under 1 year": (0,2,3,4,9). The arithmetic mean and the standard deviation for "Deaths under 1 year" are: (3,1.77) which means that with a probability greather than 0.68 "Deaths under 1 year" are in the range [1,5].

Percentiles length indicators analysis (Figure 241) show that, indeed the concentration is around the middle of the data.

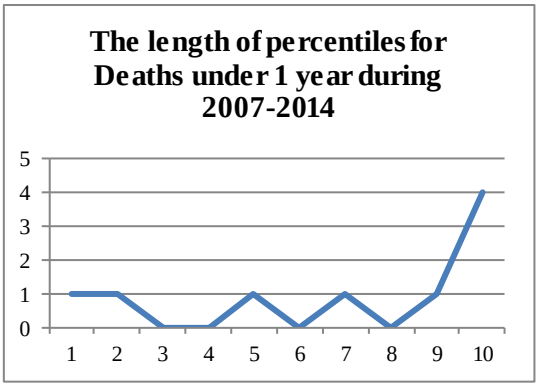


Figure 241

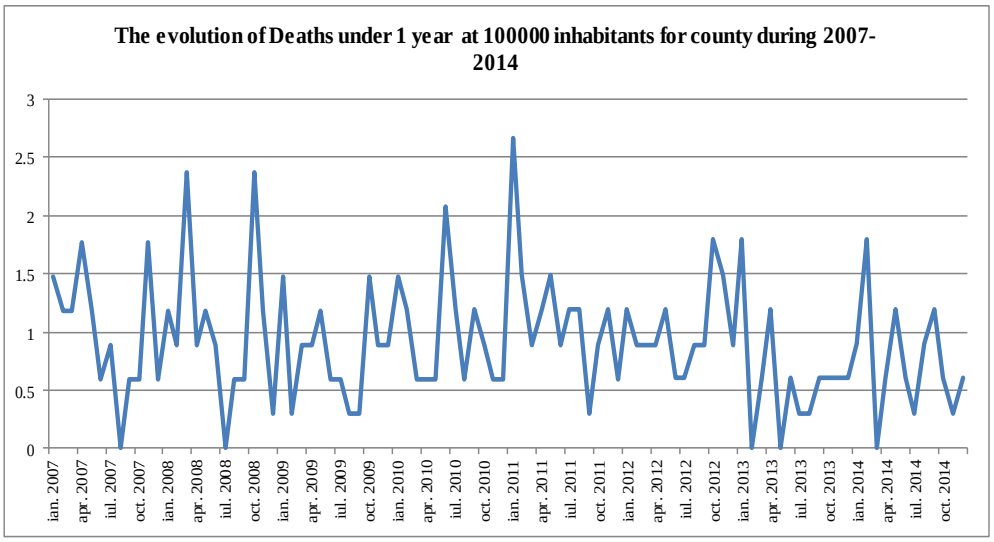


Figure 242

Regression analysis relative to indicator "Deaths under 1 year/100000 inh." gives us an equation: y=-0.003554124x+1.088 where x is the number of month (Jan, 2007=1), therefore a very small downward trend. For the set of values above, the median indicator for "Deaths under 1 year/100000 inh." is 1 and the distribution of quartiles is for "Deaths under 1 year/100000 inh.": (0,0.59,0.89,1.19,2.67). The arithmetic mean and the standard deviation for "Deaths under 1 year/100000 inh." are: (1,0.53) which means that with a probability greather than 0.68 "Deaths under 1 year/100000 inh." are in the range [0,2]. A comparison of the indicator "Deaths under 1 year" with the national level shows that it is worse than the national, being better only in 39.58% cases. A final analysis examines dependence aforementioned indicators of regional GDP variation.

Table 132. The evolution of Harghita County GDP during 2007-2014

Year	GDP (in mil. lei 2007)	Variation (%)
2007	5088	-
2008	5214	2.49
2009	4938	-5.3
2010	4640	-6.03
2011	4716	1.63
2012	4683	-0.7
2013	4779	2.05
2014	4831	1.09

Source: INSSE and own calculations

In what follows, we shall investigate if there is a dependency between GDP variation (noted with dGDP) and the aforementioned indicators.

Searching dependence annual variations of "Live births" from GDP, we find that there is a dependence of Live births from GDP offset by 1 year and the regression equation is:0.7945dGDP+-0.8841. Searching dependence annual variations of "Deceased" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Natural increase" from GDP, we find that there is not a dependence of the variation of GDP. Searching dependence annual variations of "Marriages" from GDP, we find that there is a dependence of Marriages from GDP offset by 1 year and the regression equation is: 1.1818dGDP+-1.8824. Searching dependence annual variations of "Divorces" from GDP, we find that there is a dependence of Divorces from GDP offset by 1 year and the regression equation is:-2.8456dGDP+-5.0759. Searching dependence annual variations of "Deaths under 1 year" from GDP, we find that there is not a dependence of the variation of GDP.

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