REGIONAL MIGRATION IN TURKEY WITH MARKOV CHAIN ANALYSIS

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INTRODUCTION

Since the industrial process, which started in the 1950's, two of the most important problems of developing countries, upsurge in population and fast urbanization have caused important changes in our residential model. This situation played a role in inter-regional discrepancy and inequity. (Evcil And Dokmeci, 2007)

Population movements in Turkey do not only contain movements from countryside to city but also movements occurring among the regions. While big cities have grown by immigration, the others have lost population by emigration. Besides, one of the important characteristics of migration in Turkey is that the direction of migration is from east to west (Kocaman, 1997).

So far in Turkey, contradictory policies on big cities and metropolises have been implemented. The success of metropolitan cities in the world was the reason for these contradictory policies. However, encouragement for metropolitan cities hindered population and economic development of small and medium size cities (Cabuk et al, 2007).

In the last 50 years, while metropolitan cities in Turkey have 31,3 % of total country population, it is estimated that in the coming years urbanization will rather take place as growing metropolis(Cabuk et al, 2007).

In this study, the most up-to-date data, migration data of period 1995-2000 obtained from census of year 2000, is used on the basis of Nomenclature of Territorial Units for Statistics Level 2 (nuts 2). Inter-regional migrations and distribution of population of Turkey to Nuts 2 regions in long term will be estimated with the help of Markov Chains concept, commonly used by multiregional demography. Additionally, by defining net migration and transition

probabilities among regions, direction of migration will be found out for each Nuts 2 region and assessment will be perfromed on basis of regions.

MIGRATION AS NOMENCLATURE OF TERRITORIAL UNITS FOR STATISTICS (NUTS) LEVEL 2

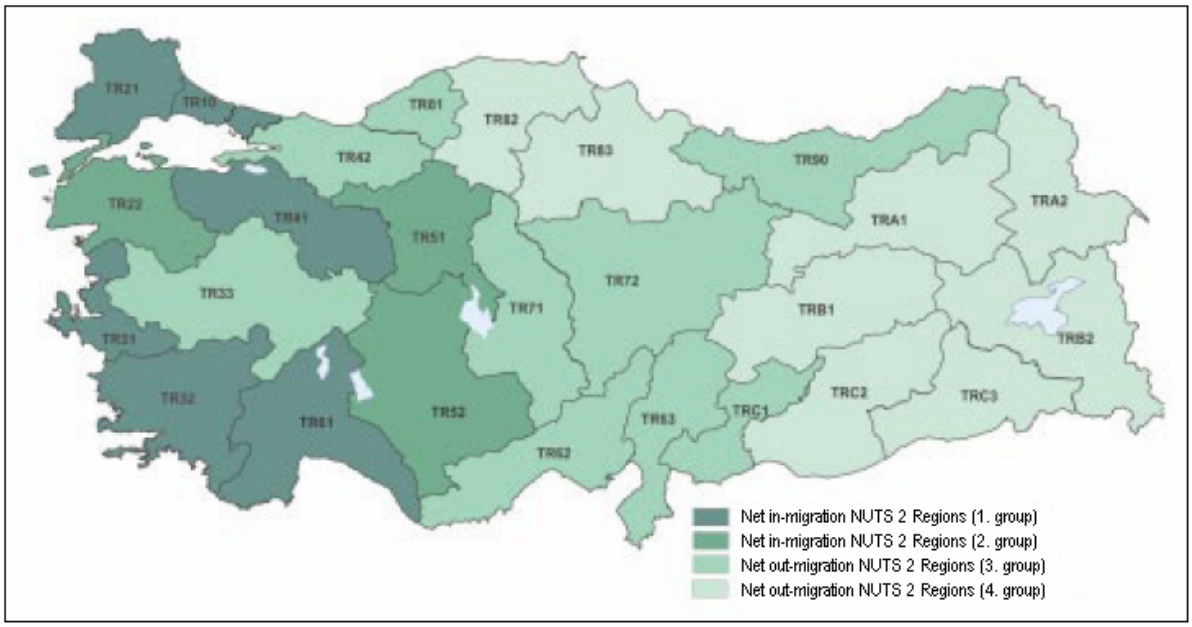
Country-wide Nomenclature of Territorial Units for Statistics (NUTS) is defined in order to collect and develop regional statistics, to conduct socio economic analyses of regions, to define the frame of regional policies and to create comparable statistical database compatible with the System of Regional Statistics of European Union. This classification is approved by Council Of Ministers on August 28, 2002 and appeared on September 22, 2002 in Official Journal no:24884. Nuts 2 regions, according to this classification, is shown at Table 1.

TABLE 1: PROVINCES IN NUTS 2 REGIONS

TR10	(İstanbul)	TR71	(Nevşehir, Niğde, Aksaray, Kırıkkale, Kırşehir)
TR21	(Edirne, Kırklareli, Tekirdağ)	TR72	(Kayseri, Sivas, Yozgat)
TR22	(Çanakkale, Balıkesir)	TR81	(Zonguldak, Bartın, Karabük)
TR31	(İzmir)	TR82	(Çankırı, Kastamonu, Sinop)
TR32	(Aydın, Denizli, Muğla)	TR83	(Samsun, Çorum, Amasya, Tokat)
TR33	(Manisa, Afyonkarahisar, Kütahya, Uşak)	TR90	(Artvin, Giresun, Gümüşhane, Ordu, Rize, Trabzon)
TR41	(Bilecik, Bursa, Eskişehir)	TRA1	(Erzurum, Erzincan, Bayburt)
TR42	(Kocaeli, Bolu, Sakarya, Yalova, Düzce)	TRA2	(Ağrı, Kars, Iğdır, Ardahan)
TR51	(Ankara)	TRB1	(Bingöl, Elazığ, Malatya, Tunceli)
TR52	(Konya, Karaman)	TRB2	(Bitlis, Hakkari, Muş, Van)
TR61	(Antalya, Burdur, Isparta)	TRC1	(Adıyaman, Gaziantep, Kilis)
TR62	(Adana, Mersin)	TRC2	(Şanlıurfa, Diyarbakır)
TR63	(Hatay, Kahramanmaraş, Osmaniye)	TRC3	(Mardin, Siirt, Batman, Şırnak)

During period 1995-2000 TR10, which includes Istanbul, received the most number of immigrants. TR31 (Izmir) and TR41 (Bilecik Bursa, Eskişehir) follows TR10. The regions sending the highest number of net immigrants are TR83, TRC2, TR90 and TR63 Nuts 2 regions. The Nuts 2 regions with highest immigration rates are TR61, TR10, TR21 ; while the ones with the highest emigration rates are TR81, TRA1, TRC3, TR83. It is clearly seen from Map1 that migration is from Eastern to Western Turkey.

MAP 1: NUTS 2 REGIONS RECEIVING NET IMMIGRATION



TR10 region, which has the highest potential for receiving immigrants, sends its emigrants to TR21, TR22, TR41 (effect of geographical nearness), TR61 and TR32 (service sector is developed here) (Table 2)

TR61 region which has the highest net immigration rate, receives net immigration from all Nuts 2 regions.

TR81 region which has the highest net emigration rate, sends emigrants mostly to TR10, which is fallowed by TR41, TR51, and TR42.

TR83 Region, which gives most emigration, gives high rates of net emigration toTR10, TR51, TR41 while receiving immigration from TR90 region.

TABLE 2: REGIONAL IN-MIGRATION, OUT-MIGRATION, NET MIGRATION AND RATE OF NET MIGRATION

NUTS 2	Population of place of residence in 2000	In-migration	Out-migration	Net migration	Rate of net migration‰
Türkiye	**60 752 995**	**4 469 952**	**4 469 952**	**0**	**0,00**
TR10	9 044 859	920 955	513 507	407 448	46,09
TR21	1 212 141	133 681	82 182	51 499	43,41
TR22	1 417 776	116 177	99 882	16 295	11,56
TR31	3 078 981	306 387	186 012	120 375	39,88
TR32	2 263 526	193 293	113 614	79 679	35,83
TR33	2 779 198	151 805	167 856	- 16 051	-5,76
TR41	2 763 559	252 693	147 681	105 012	38,73
TR42	2 437 576	210 337	233 521	- 23 184	-9,47
TR51	3 597 662	377 108	286 224	90 884	25,59
TR52	2 177 695	112 601	112 585	16	0,01
TR61	2 144 157	208 769	109 817	98 952	47,24
TR62	3 166 936	187 663	209 731	- 22 068	-6,94
TR63	2 415 592	92 274	166 430	- 74 156	-30,23
TR71	1 521 736	102 867	132 663	- 29 796	-19,39
TR72	2 249 109	122 999	188 208	- 65 209	-28,58
TR81	954 836	44 832	113 139	- 68 307	-69,07
TR82	800 863	60 655	93 202	- 32 547	-39,83
TR83	2 741 067	133 325	264 262	- 130 937	-46,65
TR90	2 866 236	151 193	227 013	- 75 820	-26,11
TRA1	1 195 475	82 416	135 592	- 53 176	-43,51
TRA2	1 007 482	69 519	128 950	- 59 431	-57,30
TRB1	1 593 579	101 659	145 375	- 43 716	-27,06
TRB2	1 635 214	75 359	141 231	- 65 872	-39,49
TRC1	1 781 309	81 472	122 760	- 41 288	-22,91
TRC2	2 419 448	96 864	194 240	- 97 376	-39,45
TRC3	1 486 983	83 049	154 275	- 71 226	-46,78

(1) Migration across the provinces within the region is not covered.

TABLE 3: NET MIGRATIONS OF NUTS 2 REGIONS ON THE BASIS OF NUTS 2 REGIONS

	TR10	TR21	TR22	TR31	TR32	TR33	TR41	TR42	TR51	TR52	TR61	TR62	TR63	TR71	TR72	TR81	TR82	TR83	TR90	TRA1	TRA2	TRB1	TRB2	TRC1	TRC2	TRC3
TR10	0	15793	6700	-3236	7042	-3722	1073	-19195	-17499	-2961	9444	-17882	-17562	-12963	-28795	-37438	-22411	-65348	-38259	-23546	-24553	-25692	-26910	-14535	-17316	-27677
TR21	-15793	0	-449	410	168	-750	37	-3288	235	-527	547	-1744	-1761	-1327	-1907	-3026	-2164	-5503	-3938	-1680	-2147	-1013	-2147	-1140	-1435	-1157
TR22	-6700	449	0	4322	473	1635	2053	-2924	384	-78	897	-1081	-1060	-923	-1658	-1004	-750	-949	-1535	-911	-1359	-886	-1225	-977	-1343	-1145
TR31	3236	-410	-4322	0	2147	-17063	-1561	-5766	-4459	-4297	2338	-5102	-4094	-4208	-7157	-2371	-839	-7591	-3388	-7898	-7056	-5050	-6181	-2694	-15164	-11425
TR32	-7042	-168	-473	-2147	0	-11209	-508	-4720	-3644	-1567	353	-3708	-3986	-1466	-2801	-1711	-736	-2994	-1681	-1854	-2397	-1945	-3779	-3400	-12726	-3370
TR33	3722	750	-1635	17063	11209	0	5678	-1009	1549	-431	6693	-1879	-1562	-1007	-1953	-806	-422	-1524	-1171	-1457	-1739	-781	-1977	-1418	-4318	-5524
TR41	-1073	-37	-2053	1561	508	-5678	0	-9231	-2689	-2706	2084	-3675	-3490	-2777	-4876	-6531	-1440	-12483	-11162	-10637	-6626	-3973	-7224	-2054	-5522	-3228
TR42	19195	3288	2924	5766	4720	1009	9231	0	9002	2194	6863	-523	-2400	-720	-1642	-4977	-868	-5227	-3531	-5288	-6482	-1361	-3874	-762	-2256	-1097
TR51	17499	-235	-384	4459	3644	-1549	2689	-9002	0	-2503	7456	-4515	-5065	-17945	-18028	-5108	-6259	-24654	-6691	-4397	-4998	-4005	-3019	-2344	-3492	-2438
TR52	2961	527	78	4297	1567	431	2706	-2194	2503	0	6143	-3099	-1969	-1038	-2053	-727	-294	-1401	-1090	-691	-534	-957	-1460	-685	-1583	-1454
TR61	-9444	-547	-897	-2338	-353	-6693	-2084	-6863	-7456	-6143	0	-8012	-7802	-3507	-5289	-2669	-1125	-4530	-2851	-1900	-1053	-2780	-3693	-3874	-4425	-2624
TR62	17882	1744	1081	5102	3708	1879	3675	523	4515	3099	8012	0	-8858	5710	1515	10	321	439	670	1115	318	-2024	-5510	-5079	-11314	-6465
TR63	17562	1761	1060	4094	3986	1562	3490	2400	5065	1969	7802	8858	0	4041	3606	643	148	884	655	1215	882	1280	500	2101	-2635	1227
TR71	12963	1327	923	4208	1466	1007	2777	720	17945	1038	3507	-5710	-4041	0	-642	-137	152	-705	-556	-195	-196	-141	-66	-3000	-2424	-424
TR72	28795	1907	1658	7157	2801	1953	4876	1642	18028	2053	5289	-1515	-3606	642	0	-18	303	405	132	69	-1101	-186	-751	-1767	-3018	-539
TR81	37438	3026	1004	2371	1711	806	6531	4977	5108	727	2669	-10	-643	137	18	0	802	470	1083	43	66	126	-7	-361	24	191
TR82	22411	2164	750	839	736	422	1440	868	6259	294	1125	-321	-148	-152	-303	-802	0	-1964	-461	-50	-178	26	-203	-222	-64	81
TR83	65348	5503	949	7591	2994	1524	12483	5227	24654	1401	4530	-439	-884	705	-405	-470	1964	0	-3162	781	507	-188	192	-489	-169	790
TR90	38259	3938	1535	3388	1681	1171	11162	3531	6691	1090	2851	-670	-655	556	-132	-1083	461	3162	0	560	-1105	-120	-472	-513	13	521
TRA1	23546	1680	911	7898	1854	1457	10637	5288	4397	691	1900	-1115	-1215	195	-69	-43	50	-781	-560	0	-1850	-796	-285	-683	-294	363
TRA2	24553	2147	1359	7056	2397	1739	6626	6482	4998	534	1053	-318	-882	196	1101	-66	178	-507	1105	1850	0	-489	743	-607	-1453	-364
TRB1	25692	1013	886	5050	1945	781	3973	1361	4005	957	2780	2024	-1280	141	186	-126	-26	188	120	796	489	0	-420	-4467	-2207	-145
TRB2	26910	2147	1225	6181	3779	1977	7224	3874	3019	1460	3693	5510	-500	66	751	7	203	-192	472	285	-743	420	0	437	-822	-1511
TRC1	14535	1140	977	2694	3400	1418	2054	762	2344	685	3874	5079	-2101	3000	1767	361	222	489	513	683	607	4467	-437	0	-6448	-797
TRC2	17316	1435	1343	15164	12726	4318	5522	2256	3492	1583	4425	11314	2635	2424	3018	-24	64	169	-13	294	1453	2207	822	6448	0	-3015
TRC3	27677	1157	1145	11425	3370	5524	3228	1097	2438	1454	2624	6465	-1227	424	539	-191	-81	-790	-521	-363	364	145	1511	797	3015	0
Toplam	407448	51499	16295	120375	79679	-16051	105012	-23184	90884	16	98952	-22068	-74156	-29796	-65209	-68307	-32547	-130937	-75820	-53176	-59431	-43716	-65872	-41288	-97376	-71226

MIGRATION ESTIMATION WITH MARKOV CHAINS APPROACH

Markov Chains is a kind of mathematical model that studies complex systems. In order to set up these kinds of models, different situations where the system can be and transition probabilities among these situations should be known. (Tankut and Saatcioglu 1973).

There are two basic assumptions in the usage of Markov Chains; current situation is the result of previous situation but independent from it. Therefore, the future situation will be dependent to current situation in some certain probabilities (Collins,1972). In the view of these assumptions transitions of units being analyzed are shown with the matrix of transitional probability. (Beyazli and others 2007).

Markov Chains are used in the fields like the spread of industrial inventions, industrial location or distribution of labor force among business lines, industrial movements, migration problems (Willis 1974), spread of illnesses, spread of information, changes in land usage (Bell 1974), inter-regional savings and capital growth, inequity of income (Richardson, 1972), optimum city sizes (Lever, 1973) and regional development. Markov Chains, also potentially applicable to other fields, can be defined as a method that provides illuminative information about probabilistic short, middle and long term development structure. (Beyazli and others 2007).

Markov Chains is an iterative process which can be formulized as $P^{(1)}=P^{(0)}.P$; $P^{(2)}=P^{(0)}.P^2$; $P^{(3)}=P^{(0)}.P^3$…… $P^{(n)}=P^{(0)}.P^n$. In the process it is possible to monitor transition to steady-state, step by step.

By applying Markov Chains to migration system, it is possible to obtain migration probabilities among rural areas, cities, provinces or regions after n period. With this method it is also possible to find out migration amount by multiplying population in an N period by migration probabilities.

The approach of Markov process is valid for macro level migration fact, however it can also be reduced to micro level (a single city, town or village). Weak side of this method is that, for every period, transition probabilities between situations are assumed to be invariable and that the factors affecting migration cannot be clearly added to the method. (Tankut and Saatcioglu, 1973).

Matrix for transition probabilities between situations are shown at Table 4. According to the table, the region with lowest emigration probability is TR52 while the one with highest probability is TRA2. Emigration probability is low for developed regions and high for undeveloped regions

From the emigrants of TRA1, the region with the highest probability of emigration, 27% emigrates to TR10, 10% emigrates to TR41, 25% emigrates to TR31, TR51, TR42 and TR90.

Most of the emigrants from TR52, the region with lowest probability of emigration, scatter over TR61, TR10, TR51 and TR31. Since this region is neighbour of two big cities, Ankara and Antalya, rate of emigration to Istanbul is lower than other regions

While emigration probability of a person from TR31 Nuts 2 region is 63 per thousand, in TR32 it is 52 per thousand and in TR33 60 per thousand.

15% of emigrants from TR31 preferred Istanbul, 12% preferred TR32 and 11% preferred TR33.

Geographical nearness is effective in the direction of migration. If there is a developed center near the region, migration will be towards near region. TR33 inclines towards TR41 as TR32 towards TR61. In Aegean Region, which contains Izmir province, emigration probability is lower than other regions. Common trait of this region is that emigration from this region is not Istanbul oriented.

TABLE 4: MATRIX FOR TRANSITION PROBABILITIES

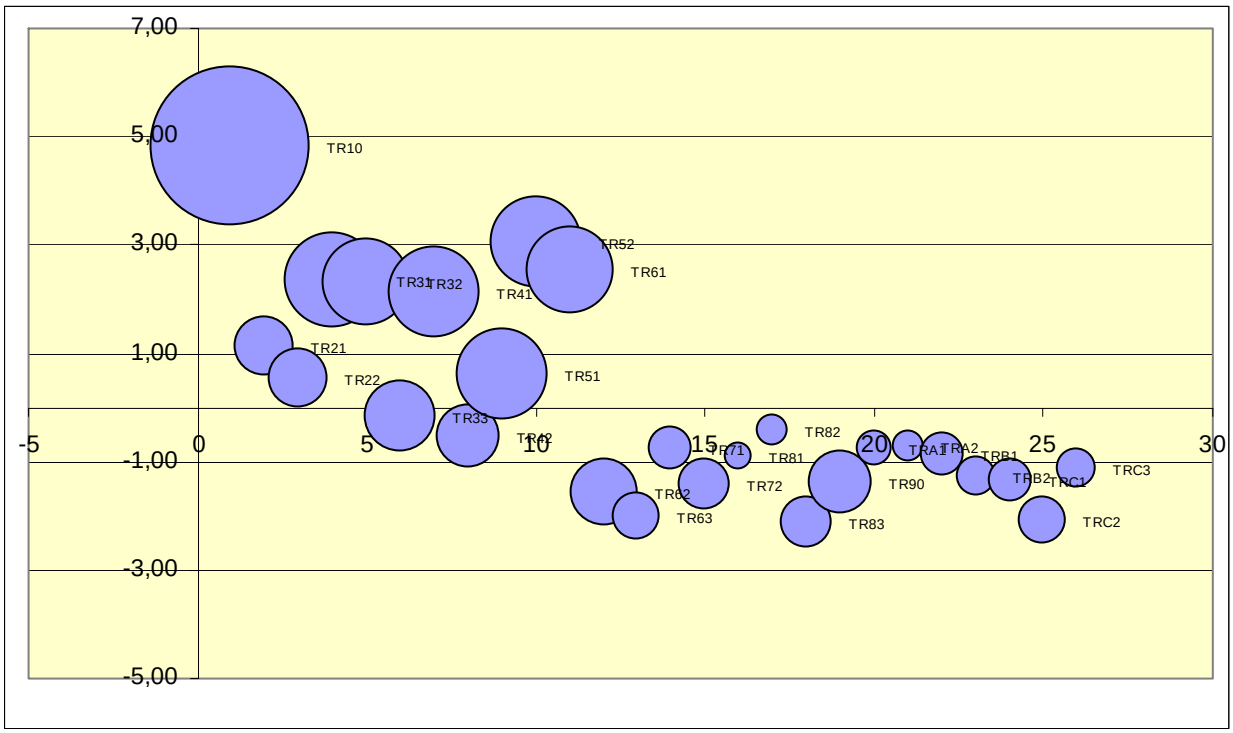
	TR10	TR21	TR22	TR31	TR32	TR33	TR41	TR42	TR51	TR52	TR61	TR62	TR63	TR71	TR72	TR81	TR82	TR83	TR90	TRA1	TRA2	TRB1	TRB2	TRC1	TRC2	TRC3
TR10	0,9405	0,0241	0,0121	0,0095	0,0060	0,0059	0,0105	0,0281	0,0139	0,0033	0,0073	0,0102	0,0107	0,0142	0,0203	0,0461	0,0507	0,0326	0,0301	0,0293	0,0357	0,0256	0,0215	0,0127	0,0113	0,0252
TR21	0,0051	0,9292	0,0035	0,0013	0,0010	0,0011	0,0018	0,0029	0,0016	0,0005	0,0009	0,0011	0,0012	0,0015	0,0014	0,0038	0,0036	0,0027	0,0020	0,0029	0,0041	0,0016	0,0022	0,0011	0,0013	0,0018
TR22	0,0027	0,0038	0,9287	0,0031	0,0015	0,0027	0,0035	0,0028	0,0021	0,0004	0,0011	0,0009	0,0009	0,0013	0,0014	0,0018	0,0019	0,0012	0,0011	0,0022	0,0028	0,0018	0,0017	0,0010	0,0015	0,0018
TR31	0,0029	0,0037	0,0096	0,9371	0,0096	0,0136	0,0041	0,0046	0,0059	0,0026	0,0038	0,0032	0,0028	0,0046	0,0048	0,0037	0,0024	0,0042	0,0026	0,0093	0,0103	0,0058	0,0057	0,0026	0,0080	0,0101
TR32	0,0023	0,0020	0,0026	0,0078	0,9480	0,0073	0,0021	0,0033	0,0036	0,0013	0,0058	0,0021	0,0024	0,0021	0,0022	0,0027	0,0020	0,0020	0,0015	0,0033	0,0043	0,0026	0,0037	0,0026	0,0059	0,0037
TR33	0,0015	0,0019	0,0066	0,0071	0,0042	0,9399	0,0039	0,0023	0,0022	0,0013	0,0032	0,0015	0,0014	0,0019	0,0019	0,0021	0,0018	0,0015	0,0012	0,0032	0,0038	0,0022	0,0028	0,0016	0,0027	0,0055
TR41	0,0033	0,0041	0,0081	0,0032	0,0023	0,0057	0,9444	0,0080	0,0049	0,0015	0,0026	0,0022	0,0022	0,0034	0,0035	0,0080	0,0032	0,0058	0,0057	0,0112	0,0086	0,0046	0,0059	0,0019	0,0035	0,0038
TR42	0,0058	0,0034	0,0028	0,0019	0,0016	0,0017	0,0039	0,9051	0,0035	0,0007	0,0015	0,0018	0,0019	0,0025	0,0030	0,0101	0,0044	0,0042	0,0069	0,0074	0,0089	0,0028	0,0047	0,0013	0,0019	0,0025
TR51	0,0036	0,0049	0,0055	0,0055	0,0040	0,0033	0,0054	0,0086	0,9184	0,0027	0,0057	0,0049	0,0042	0,0217	0,0140	0,0090	0,0174	0,0140	0,0056	0,0087	0,0097	0,0070	0,0049	0,0033	0,0046	0,0051
TR52	0,0012	0,0012	0,0012	0,0021	0,0018	0,0018	0,0014	0,0021	0,0025	0,9728	0,0042	0,0031	0,0017	0,0045	0,0022	0,0015	0,0016	0,0013	0,0010	0,0021	0,0022	0,0021	0,0021	0,0012	0,0014	0,0023
TR61	0,0028	0,0020	0,0022	0,0034	0,0056	0,0047	0,0028	0,0041	0,0055	0,0036	0,9463	0,0040	0,0043	0,0040	0,0038	0,0035	0,0023	0,0025	0,0018	0,0030	0,0025	0,0031	0,0034	0,0031	0,0027	0,0036
TR62	0,0017	0,0014	0,0012	0,0017	0,0014	0,0010	0,0012	0,0021	0,0032	0,0017	0,0024	0,9342	0,0107	0,0039	0,0034	0,0010	0,0011	0,0011	0,0009	0,0022	0,0027	0,0064	0,0064	0,0084	0,0086	0,0095
TR63	0,0011	0,0011	0,0008	0,0010	0,0009	0,0007	0,0008	0,0010	0,0015	0,0005	0,0014	0,0056	0,9332	0,0013	0,0014	0,0008	0,0009	0,0008	0,0007	0,0015	0,0016	0,0024	0,0016	0,0055	0,0030	0,0017
TR71	0,0011	0,0008	0,0008	0,0010	0,0009	0,0007	0,0009	0,0013	0,0045	0,0014	0,0013	0,0037	0,0025	0,9145	0,0046	0,0009	0,0014	0,0013	0,0008	0,0016	0,0014	0,0013	0,0011	0,0023	0,0016	0,0015
TR72	0,0021	0,0011	0,0012	0,0013	0,0010	0,0008	0,0012	0,0022	0,0041	0,0007	0,0017	0,0030	0,0027	0,0065	0,9187	0,0012	0,0015	0,0026	0,0011	0,0026	0,0030	0,0026	0,0016	0,0018	0,0021	0,0017
TR81	0,0011	0,0008	0,0006	0,0005	0,0005	0,0005	0,0006	0,0022	0,0012	0,0002	0,0005	0,0003	0,0006	0,0005	0,0005	0,8894	0,0029	0,0006	0,0009	0,0007	0,0006	0,0005	0,0005	0,0004	0,0003	0,0005
TR82	0,0023	0,0007	0,0006	0,0004	0,0004	0,0004	0,0005	0,0012	0,0024	0,0003	0,0004	0,0004	0,0004	0,0009	0,0007	0,0031	0,8882	0,0021	0,0007	0,0006	0,0008	0,0005	0,0005	0,0004	0,0003	0,0005
TR83	0,0033	0,0019	0,0017	0,0015	0,0012	0,0010	0,0016	0,0028	0,0044	0,0006	0,0014	0,0011	0,0012	0,0020	0,0034	0,0022	0,0049	0,9080	0,0056	0,0025	0,0021	0,0021	0,0015	0,0011	0,0011	0,0013
TR90	0,0058	0,0017	0,0013	0,0014	0,0012	0,0009	0,0021	0,0068	0,0028	0,0005	0,0012	0,0011	0,0011	0,0012	0,0014	0,0035	0,0020	0,0046	0,9228	0,0054	0,0035	0,0016	0,0017	0,0009	0,0007	0,0010
TRA1	0,0015	0,0017	0,0013	0,0013	0,0010	0,0009	0,0013	0,0016	0,0019	0,0005	0,0009	0,0012	0,0012	0,0011	0,0014	0,0009	0,0009	0,0014	0,0025	0,8914	0,0044	0,0021	0,0012	0,0010	0,0005	0,0006
TRA2	0,0016	0,0019	0,0011	0,0013	0,0010	0,0008	0,0010	0,0012	0,0015	0,0004	0,0008	0,0010	0,0010	0,0008	0,0009	0,0007	0,0008	0,0009	0,0009	0,0023	0,8791	0,0012	0,0016	0,0010	0,0010	0,0010
TRB1	0,0019	0,0014	0,0015	0,0015	0,0010	0,0010	0,0013	0,0013	0,0021	0,0006	0,0011	0,0026	0,0021	0,0013	0,0017	0,0010	0,0010	0,0011	0,0008	0,0021	0,0013	0,9112	0,0020	0,0048	0,0029	0,0016
TRB2	0,0011	0,0014	0,0012	0,0012	0,0012	0,0010	0,0011	0,0017	0,0015	0,0005	0,0010	0,0017	0,0013	0,0011	0,0009	0,0008	0,0008	0,0010	0,0008	0,0015	0,0033	0,0018	0,9170	0,0011	0,0012	0,0028
TRC1	0,0010	0,0008	0,0006	0,0007	0,0006	0,0005	0,0006	0,0007	0,0011	0,0003	0,0009	0,0032	0,0049	0,0007	0,0007	0,0004	0,0005	0,0005	0,0004	0,0010	0,0011	0,0026	0,0015	0,9326	0,0059	0,0023
TRC2	0,0013	0,0016	0,0017	0,0017	0,0010	0,0009	0,0012	0,0010	0,0023	0,0005	0,0012	0,0033	0,0020	0,0010	0,0009	0,0008	0,0008	0,0009	0,0006	0,0009	0,0009	0,0030	0,0014	0,0046	0,9228	0,0072
TRC3	0,0013	0,0014	0,0012	0,0015	0,0011	0,0011	0,0010	0,0011	0,0016	0,0005	0,0014	0,0026	0,0016	0,0013	0,0009	0,0009	0,0010	0,0010	0,0007	0,0011	0,0012	0,0014	0,0017	0,0016	0,0033	0,9010
TOTAL	0,0595	0,0708	0,0713	0,0629	0,0520	0,0601	0,0556	0,0949	0,0816	0,0272	0,0537	0,0658	0,0668	0,0855	0,0813	0,1106	0,1118	0,0920	0,0772	0,1086	0,1209	0,0888	0,0830	0,0674	0,0772	0,0990

TABLE 5: ESTIMATION OF MIGRATION WITH MARKOW CHAINS

Nuts 2	Population of year 2000	Distribution for year 2000 (%)	Distribution for year 2015 (%)	Distribution for year 2045 (%)	Steady-State distribution (%)	Difference (%)
TR10	10018735	14,78	17,60	18,09	19,71	4,82
TR51	4007860	5,91	6,44	6,51	6,52	0,59
TR62	3500878	5,16	4,94	4,84	3,64	-1,57
TR31	3370866	4,97	5,93	6,08	7,43	2,36
TR90	3131546	4,62	4,17	3,99	3,35	-1,37
TR33	3051801	4,50	4,44	4,37	4,42	-0,16
TR41	3025475	4,46	5,32	5,45	6,66	2,11
TR83	2999460	4,42	3,58	3,33	2,38	-2,14
TRC2	2806130	4,14	3,23	3,14	1,88	-2,10
TR42	2715766	4,01	3,83	3,77	3,48	-0,53
TR63	2714892	4,00	3,37	3,24	1,95	-2,03
TR32	2516114	3,71	4,36	4,53	6,05	2,33
TR72	2498442	3,68	3,20	3,07	2,30	-1,41
TR61	2490235	3,67	4,27	4,56	6,08	2,55
TR52	2435376	3,59	4,07	4,23	6,62	3,03
TRC1	2023784	2,98	2,58	2,52	1,57	-1,36
TRB2	1956437	2,89	2,19	2,17	1,42	-1,27
TRC3	1778705	2,62	1,94	1,91	1,31	-1,14
TRB1	1770597	2,61	2,29	2,21	1,74	-0,88
TR71	1690826	2,49	2,26	2,19	1,76	-0,74
TR22	1541322	2,27	2,47	2,48	2,86	0,52
TR21	1354658	2,00	2,40	2,50	3,13	1,14
TRA1	1351588	1,99	1,60	1,54	1,21	-0,76
TRA2	1156150	1,71	1,28	1,22	0,96	-0,70
TR81	1024879	1,51	1,12	1,00	0,68	-0,90
TR82	871405	1,29	1,11	1,05	0,91	-0,40
Total	67 803 927	100,00	100,00	100,00	100,00	0,00

Distribution of population with Markov Chains is shown at Table 5. It is estimated that population density of Istanbul will continuously rise and Istanbul will contain 17,6% of total country population in 2015; 18,09% in 20025 and 19,71% in steady-state. The regions containing small part of the population already like TR82, TR81, TRA2, TRA1 will lose more population.

GRAPHIC 1: REGIONAL DISTRIBUTION OF COUNTRY POPULATION AT STEADY-STATE AND DIFFERENCES FROM THE YEAR 2000



In Graphic 1, the difference between distribution of population at steady-state and distribution of population in year 2000 is shown on “y” axis. The sizes of circles represent sizes of steady-state populations. It is seen from Graphic 1 that, assuming the conditions will not change, populations of the regions with big metropolis will continuously rise in the steady-state while those of the regions with small population will decrease. This will increase inter-regional differences in terms of development.

CONCLUSION

It is a clear fact that in Turkey, inland migration creates big problems for both regions sending and receiving immigrants. While regions receiving immigrants face many problems ranging from urban sprawl to social sidelining, small regions however regress in socio economic aspect due to lost of educated human resources and labor force.

Between 1930-1950, Turkey created new industrial centers (Kayseri, Karabuk, Nazilli) instead of developing big cities of Ottoman era like Istanbul, Izmir, Bursa. After 1950’s, due to political reasons, this strategy, which was disadvantageous for big cities was given up. The return to an industrialization and urbanization strategy in leadership of big cities resulted in unplanned and uncontrolled migration to big cities like Istanbul, Ankara, Izmır. (Cabuk and Others,2007)

Result of the study shows that the most important immigration center of Turkey is TR10 Nuts 2 region which includes Istanbul. This region receives most of the immigrants from TR90, which is in Black Sea Region, and TR42, which is in Marmara Region. If there are developed metropolis around near regions, emigration will be densely towards these metropolis.

In long term, it is expected that as big as 20% of total population will live in Istanbul, while population rate will considerably decrease in regions like TR81, TR82, TRA2 and TRA1. It is impossible to decrease inter-regional differences in terms of development with these regions continuously weakening in man power. So it is of crucial importance to define expedient policies by creating development poles which have high potential to serve their environment and grow.

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