TRADE OPENNESS, URBAN CONCENTRATION AND CITY-SIZE GROWTH IN TURKEY

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Abstract

Aim of the present study is to investigate two important issues on urban concentration in Turkey. First, we investigate whether population tend to have an uneven distribution across cities between 1965-2012, second, we analyze the determinants of city-size growth by relating it to the process of trade liberalization and to a range of other socio-economic and geographical factors. In terms of methodology, we employ various cross sectional and spatial econometric tools to implement our analysis. Our results indicate three major conclusions: First, urban concentration tends to increase recently, leading to an unevenly growing cities and creating urban giants (i.e. Istanbul). Second, trade liberalization is shown to intensify this process since metropolitan areas, which are more open to trade, tend to grow faster than others. Third, specialization of cities in industrial activities (i.e. manufacturing) and economies of agglomeration are likely to reinforce the spatial concentration of population around larger cities.

Keywords: Trade Liberalization, City Growth, Urban Concentration, Zipf Law
JEL classification: R12, R23, F14

1. Introduction

The world population has been steadily increasing over the last century. While it was about 2 billion in 1900s, it has reached to 6 billion in 2000, 6.8 billion in 2013 and estimated to be about 10 billion in 2100. (Source: United Nations (UN)). More importantly, urban population has been rising at a faster pace. For instance, its share in total population has risen from 30 % in 1950s and to about 50 % in 2010 (Source: UN).

Rapid urbanization is seen as one of the most important threats against sustainable development. As emphasized in World Bank's Development Report (2003), uneven distribution of population within a country (i.e. excessive urban primacy) is likely to bring about severe socio-economic and environmental problems (Nitch 2006). Such that it might lead to increased real economic costs, urban crime, congestion and inequalities.

The issue of urban concentration and its recent trends has been analyzed in a number of empirical studies. Some recent examples are Glaeser et al. (1995) who focus on 203 large cities in U.S., Giesen and Sudekum (2009) who analyze 2143 largest German cities in the same context and Eaton and Eckstein (1997) who studies urban concentration in France.

Regarding Turkey, rate of urbanization has also risen substantially over the last few decades. Share of urban population has increased from 24 % in 1927 to 44 % in 1980 and to 65 % in 2000 (Evcil et al. 2006; Deliktas et al. 2013)[1]. Several scholars have pointed out this fact in empirical studies. The most remarkable ones are Deliktas et al (2013) and Marin (2007) who reach to similar conclusions that Turkish urban system has followed an uneven development after 1980s with high concentration around metropolitan cities.

[1] Source: TUIK

The reason of why such an unbalanced urbanization and city growth exist is an important question. Deliktas et al. (2013) analyze the determinants of city-size growth in Turkey between 1980-2007. They employ a wide range of economic, social and cultural variables and report that cities with high fertility and net migration rate and those of which specialize in manufacturing sector and located along the coast tend to exhibit higher population growth. Similarly, Filitekin (2006) investigates the same issue for Turkish cities between 1950-2000 and reports that cities which have high market potential and located along the coast are likely to have higher population growth. Finally, Marin (2007) argues that uneven development of urban areas in Turkey is related to liberal economic and social policies applied after 1980s.

Although these issues have been heatedly discussed within the literature, there are several directions that need to be further explored:

First, among the variety of determinants, the impact of trade openness and liberalization process has not yet adequately been studied. In fact, trade liberalization might have substantial and varying effects on the city-size distribution and growth. The impact can actually be twofold:

One the one hand, Krugman and Elizondo (1996) claim that trade liberalization makes it more likely that the population is spatially dispersed. In a similar vein, Hanson (1998), Krugman and Hanson (1993), Nitch (2006) and Ades and Glaeser (1995) argue that trade openness is generally coupled with decentralization of economic activity and population. The rationale behind this claim is that as the country opens its markets to trade, level of competition intensifies in core and metropolitan areas that pushes firms and laborers to relocate towards low-cost peripheral cities in search of cheaper capital and land and higher profit rates (Erdem 2015; Fan and Casetti, 1994;Rodriquez-Pose and Gill, 2006; Krugman and Elizondo 1996). This diffusion process will naturally make population and firms more dispersed within the country.

On the other hand, a counter argument, which is in line with the views of Myrdal (1957) has been put forward. Such that trade liberalization is likely to benefit central-metropolitan cities which attract firms and laborers as these areas provide several advantages such as low cost access to foreign markets, reduced transport costs, developed infrastructure, public services and job incentives (Rivas 2007; Erdem 2015). Increasing returns to scale created by locational agglomeration will reinforce the centrifugal effects and direct firms and laborers to flow into large metropolitan cities. Thus, it will lead to a spatially concentrated population.

Empirically, trade openness is likely to be a relevant variable for Turkey which has been experiencing a period of rapid liberalization during the last few decade, i.e. post 1980

In fact, prior to 1980, more closed and import substitution approached have been adopted. In 1930s, state assisted industrialization has been followed and 5 year development plans were initiated (Uckac, 2010; Özcan, 1998). During 1940s and 1950s, increased imports were coupled with external debts and trade deficits (Uckac, 2010; Özcan, 1998). Economic approach to growth has been started to change towards free trade, loans and foreign aid (Uckac, 2010; Özcan, 1998). Starting from 1980, a real turning point for the liberalization was experienced. Export-led economic growth has been adopted as a main strategy, instead of import substitution. Integration to commodity markets were achieved in several steps, i.e. international trade agreements For instance, Turkish Lira has become convertible in 1989, Customs Union agreement were signed in 1995 and Turkey has participated in World Trade Organization in 1996. These institutional arrangements were aimed to remove all types of barriers against the free flow of commodities and production factors among partner countries. As a consequence, the volume of foreign trade has dramatically risen (i.e. from about 11 Billion dollars in 1980 to 389 Billion dollars in 2012.)

Our second contribution to the literature is rather methodological. So far, existing studies has largely neglected the possible spatial dependence and interconnectivity among the populations of neighboring cities in their empirical analysis. Failing to take into account the spatial autocorrelation might, in fact, create a serious bias for estimations. For this reason, we address this issue by incorporating the geographical weights and spatial factors into our analysis.

So, aim of the present study is twofold. First, we analyze whether population in Turkey tend to have an uneven distribution across cities over the period of 1965-2012 by testing the famous Zipf's law. Second, we analyze the determinants of city-size growth by relating it to the process of trade liberalization and to a range of other social, economic and geographical variables. In terms of methodology, we employ various cross sectional and spatial regression models to implement our analysis.

2. Urban Concentration and Zipf's Law in Turkey, 1965-2012

The recent trends of urban concentration have been currently discussed for various countries. The vast majority of researchers find evidence in favor of stable populations and parallel growth of cities over time. Some examples of these studies are Eaton and Eckstein (1997) who investigates the populations of 40 urban areas in France and Japan for the period of 1876-1990 and 1925-1985, Giesen and Sudekum (2009) who focus on 2143 German cities between 1975-1997 and Ionnides and Skouras (2009) who study large U.S. urban places in 2000.

Regarding Turkey, the picture is somewhat different as the results are quite mixed. For instance, Filiztekin (2006) analyzes the city-size distributions over the period of 1950-2000 and report evidence of stable distribution of populations. Similarly, Turk and Dokmeci (2001) find evidence in favour of parallel growth of cities over the period of 1980-1997. In contrast, Deliktas et al. (2013) and Marin (2007) are the authors who report a tendency towards unevenly distributed city populations within the country, especially after mid-1980s.

To shed more light on this issue, we empirically analyze and demonstrate the evolution of city-size distributions within the country. As a start, we summarize in Table 1 the descriptive statistics. Specifically, it documents the maximum and minimum values of city populations along with their mean, standard deviation and coefficient of variation values for the years between 1965 and 2012.

Table 1: Descriptive Statistics on City sizes (populations), 1965-2012

Years	max	min	mean	SD	SD/Mean
1965	1792071	14132	161280,9	254167,1	1,575928
1970	2203337	20794	204344,8	320519,5	1,568523
1975	2648006	30332	251777,1	401566	1,594926
1980	2909455	36184	293209,1	448027,2	1,528013
1985	5560908	43085	405489	763676,3	1,883346
1990	6753929	41295	453196	862440,7	1,903019
2000	9085599	39725	543286,2	1101175	2,026878
2007	11174257	35835	614171,1	1346775	2,192834
2008	12569041	36502	661873,1	1507497	2,277622
2009	12782960	34548	676632,3	1535451	2,269255
2010	13120596	33701	694103,2	1576054	2,270634
2011	13483052	37424	708465,5	1617687	2,283367
2012	13710512	37522	721585,6	1644688	2,279269

At a glance, an interesting observation appears to emerge that the mean values tend to increase over time (i.e. from 161.280 inhabitants in 1965 to 721.585 inhabitants in 2012) while the standard deviation increases at a faster pace (i.e. from 254.167 in 1965 to 1.644.688 in 2012). This indicates the fact that Turkish cities tend to grow quite unevenly over time. Similarly, Coefficient of Variation, which is shown in the last column, confirms this trend as it rises steadily in the recent decades. In sum, city-sizes tend to become more and more heterogeneous over time, thereby, creating urban giants one the one hand (i.e. Istanbul, Izmir and Ankara) and some tiny cities on the other (i.e. Bayburt, Tunceli).

To support these findings visually, we provide two additional analyses. First, we chart in Figure 1 the evolutions of populations in 3 largest cities relative to the average city population. Second, we demonstrate in Figure 2 the population shares of cities in total population using a map.

Figure 1 : Relative population of cities (average of Turkey=1), 1965-2011

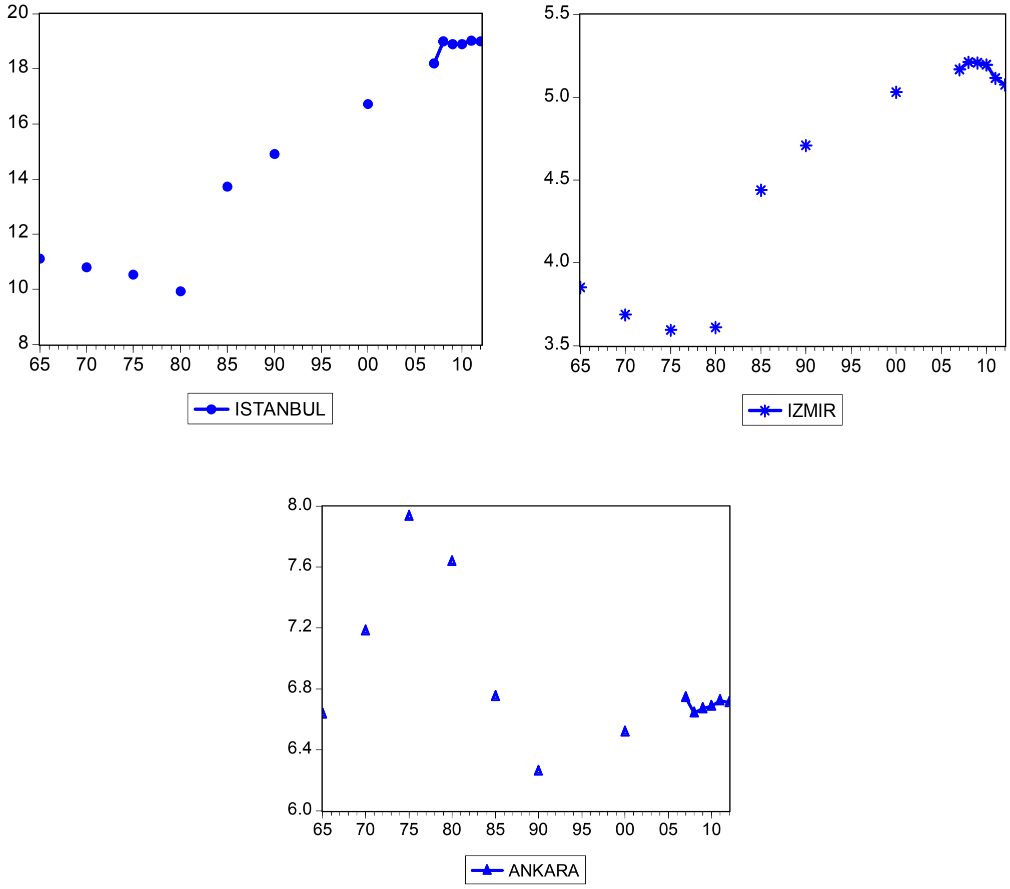

Figure 2: Population Share of Cities, 2012

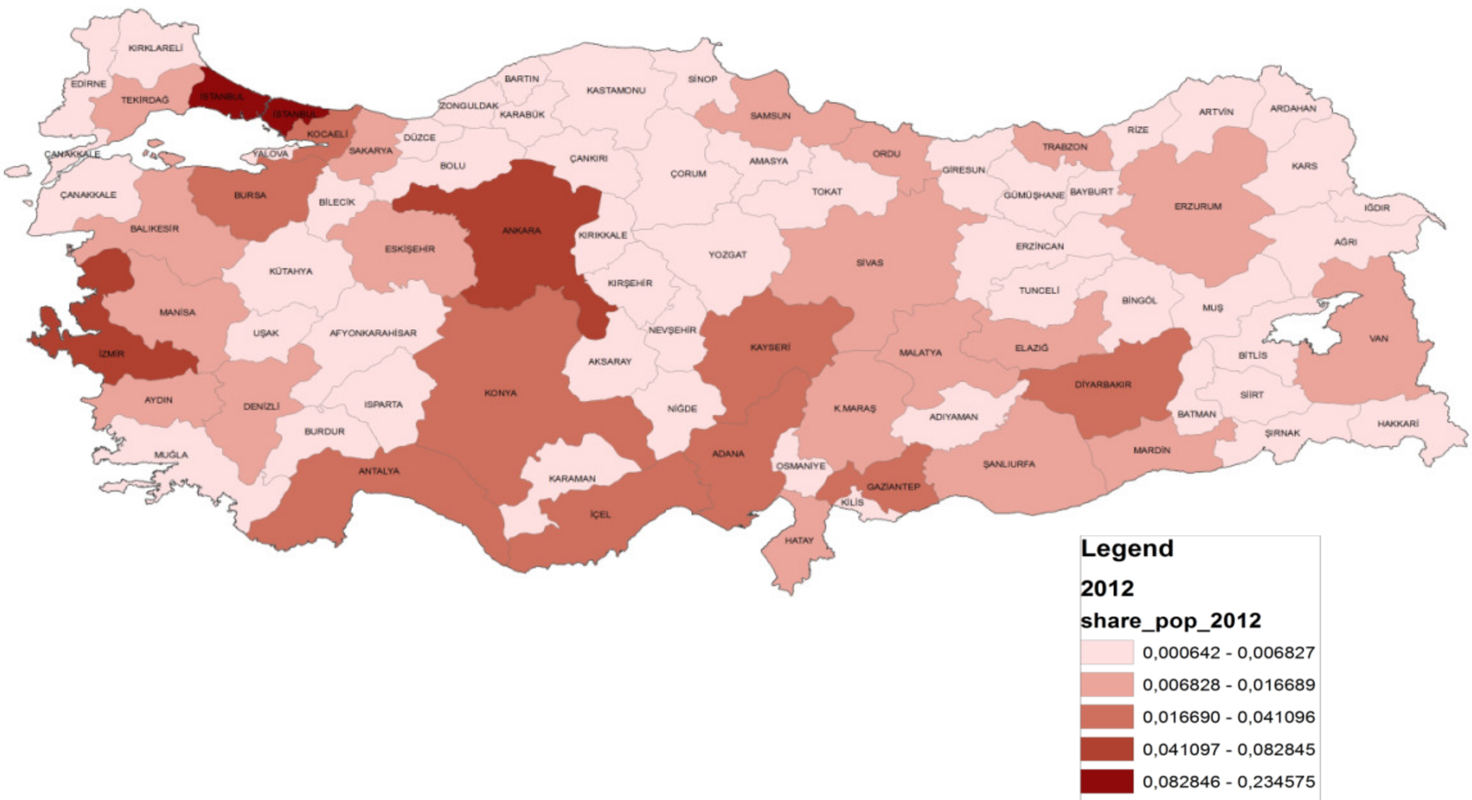

Figure 1 provides evidence in favor of polarizing populations across cities. For instance, Istanbul, the largest city in Turkey, had a population (about) 11 times bigger than an average city in 1965, and, this has risen to 19 times in 2012. A similar tendency has also been observed for Izmir which has grown faster than the average. However, for Ankara, an opposite trend is present.

Figure 2 illustrates, instead, the geographical pattern of population shares. We observe that the most populated cities are concentrated around coastal, Western and Middle Anatolian regions while cities in Eastern and South-Eastern regions are less populated. From 1965 to 2012, the range of population shares change substantially. While it ranges between 0.1 % and 16.5 % in 1965, this interval widens in 2012 and becomes 0.06 %-23.5 % which indicates, once more, an increasing heterogeneity of city-sizes.

Testing the Zipf Law.

More formally, one may attempt to test the validity of uneven city-sizes and its tendency over time using Zipf's law (Gabaix 1999; Zipf, 1949). It is a statistical test initially introduced by Auerbach in 1913 and, currently, known as one of the most commonly accepted approaches in the literature. Specifically, it is based on the following Pareto distribution (Deliktas et al. 2013)[2]:

$$R_i = AS_i^{-\beta} \tag{1}$$

where *S* represents the population of city *i* and *R* is the rank of cities starting from the most populated city to the least one. *A* represents the expected population of the largest city (Deliktas et al. 2013).

Most important, Pareto Exponent, β, captures the validity of Zipf's law. If β=1, for instance, it would mean that cities follow a proportional growth and stable relative populations (Deliktas et al. 2013)

. As β<1 or β>1, it deviates from Zipf's Law. In order to perform this test, we refer to the following regression equation (Deliktas et al. 2013)[3]:

$$\ln R_i = \gamma - \beta \ln S_i + u_i \tag{2}$$

which takes a log-linearized form. We estimate it using OLS for the years which the data is available. We adopt Newey–West HAC Heteroskedasticity and Autocorrelation consistent errors to avoid possible bias and inconsistency driven by heteroskedasticity and autocorrelation. Additionally, we test whether β=1 using Wald test (Ho: β=1) to understand the validity of Zipf's Law.

The estimations are summarized in Table 2 from which we can derive several results: First, initially in 1965, Pareto exponent is 1.004 but not significantly different from 1 as the Wald test statistic is insignificant. Therefore, the Zipf's law seems to hold and populations are somewhat homogenously distributed throughout the country. However, over the years, increases until 1980 and decreases afterwards. It becomes, for instance, 1.014 in 1980, 0.960 in 1990, 0.894 in 2000, 0.824 in 2010 and 0.832 in 2012.

Moreover, the Wald statistic turns to be significant from 2007 onwards, indicating the fact that Zipf's law does not hold anymore and population is distributed more heterogeneously within the country.

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[2] The following equation is borrowed from Deliktas et al. (2013)

[3] The following equation is borrowed from Deliktas et al. (2013)

Table 2: Zipf Law Test, OLS Results, 1965-2012

Dep. Var: ln (Rank)	1965	1970	1975	1980	1985	1990
constant	14.818***	15.348***	15.404***	15.546***	15.190***	15.310***
(S.E)	1.144	1.019	0.948	0.978	0.833	0.909
ln(pop)	-1.004***	-1.028***	-1.016***	-1.014***	-0.967***	-0.960***
(S.E)	0.098	0.085	0.078	0.079	0.066	0.072
Wald Test	0.0016	0.1077	0.0433	0.0335	0.2336	0.3022
R-Squared	0.92	0.92	0.93	0.93	0.94	0.94

Table 2 (continued)

Dep. Var: ln (Rank)	2000	2007	2008	2009	2010	2011	2012
constant	14.699***	14.285***	14.005***	13.965***	13.909***	14.0310***	14.049***
(S.E)	1.089	1.021	0.965	0.993	1.028	0.966	0.970
ln(pop)	-0.894***	-0.858***	-0.834***	-0.829***	-0.824***	-0.832***	-0.832***
(S.E)	0.085	0.079	0.075	0.077	0.079	0.075	0.752
Wald Test	1.5020	3.1418*	4.8297**	4.8323**	4.8474**	4.9959**	4.9598**
R-Squared	0.92	0.92	0.93	0.93	0.92	0.93	0.93

S.E.: Newey West, Heteroskedasticity andf Autocorrelation consistent standard errors., Note: ***indicates significance at 1 %, ** at 5 %, * at 1%

One may consequently argue that, these tendencies might be driven by a range of social, economic, political and geographical determinants which is a subject to be investigated in the next section.

3. Determinants of city growth, 2000-2012

Various determinants of city-size growth have been considered in the literature. In general, we can classify them into several categories such as ***economic***, ***social, cultural*** and ***geographical*** variables**.**

In terms of economic ones, industrial structure and specialization, agglomeration of activities, level of development (i.e. per capita GDP), trade openness, market size, level competition and infrastructure are recognized as the most popular determinants (Deliktas et al. 2013). Rosen and Resnick (1980) and Alperovich (1993), for instance, argues, that Pareto exponent of countries rises with higher per capita income and better infrastructure facilities (i.e. rail-road density). Deliktas et al. (2013) points to the importance of industrial structure and agglomeration and claim that cities which specialize in industrial and commercial activities (i.e. manufacturing) are likely to have higher population growth given the availability of job opportunities in these areas. Da Mata et al. (2007) suggests that the population growth in Brazil is higher in cities with high market potential, good labor force quality and lower transport costs.

With regard to social and cultural variables, net migration rate, health indicators, rate of fertility, literacy rate, schooling and crime rate may be referred to as the most well-known ones. Deliktas et al. (2013), for instance, report evidence of the fact that Turkish cities which have relatively higher net migration and fertility rate, and lower schooling rate tend to have higher population growth.

Geographical variables mostly refer to the location of cities. According to Filiztekin (2006) and Deliktas et al. (2013) cities that are located in the core regions and along the coast are particularly likely to grow as the natural amenities, climate, market size and economic incentives attract the laborers to these places.

Among other variables, trade openness and liberalization policies deserve a special attention. As anticipated earlier, two different interpretations exist.

One the one hand, Krugman and Elizondo (1996) claim that trade liberalization makes it more likely that the population will be diffused throughout the country. In support of this argument, Hanson (1998), Nitch (2006), Krugman and Hanson (1993) and Ades and Glaeser (1995) argue that trade openness is associated with less centralized population and weaker urban primacy. As the country opens up the markets to foreign trade, level of competition among domestic and foreign firms intensify in metropoliten areas that forces firms and laborers to move towards low-cost peripheral cities (Krugman and Elizondo 1996; Erdem 2015).

On the other hand, a counter-argument points to an opposite effect (in line with Myrdal 1957). Such that trade liberalization generates additional advantages to already developed metropolitan cities. It attracts firms and laborers as these cities provide low cost access to foreign markets, job opportunities, reduced transport costs, developed infrastructure and public goods. Positive externality and increasing returns to scale created by locational concentration will reinforce the centrifugal effects. It will, hence, create spatially uneven city-sizes (Rivas 2007; Erdem 2015).

Indeed, we think trade openness might be a relevant variable as Turkey has experienced a rapid liberalization process in recent decades. As a consequence of liberal policies, deregulations and international agreements (i.e. Customs Union), barriers against the free flow of commodities and production factors are eliminated. Thus, the volume of exports and imports has grown about 40 times over the last 50 years. To illustrate this, the evolution of foreign trade volume is depicted in Figure 3 for the period of 1923-2011. It clearly follows an exponential upward-trend with a great jump after 2000.

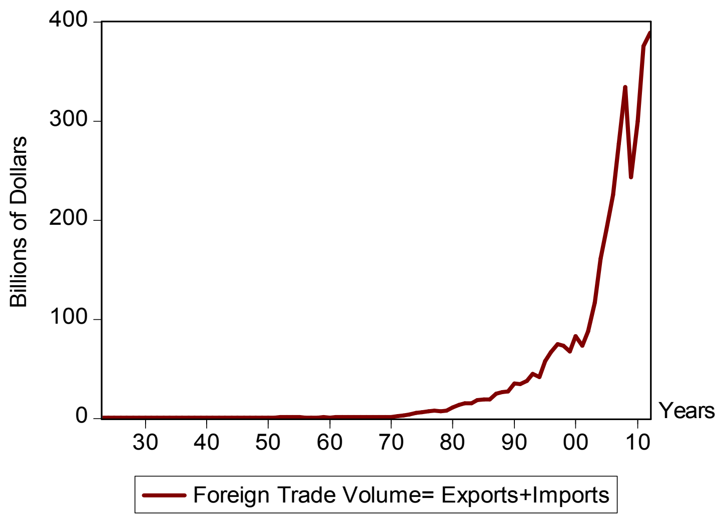

Figure 3: Evolution of Trade Liberalization in Turkey, 1923-2011

Our empirical model which incorporates a range of factors is based on the following regression equation (3):

$$ln\ \Delta pop_i = \alpha + \beta_1\ ln\, trade_i + \beta_2\, ln\, indus_i + \beta_3\, ln\, aggl_i + \beta_4\, ln\, migr_i + \beta_5\, ln\, fert_i + \beta_6\, ln\, crime_i + \beta_7 d\_coast_i + \beta_8 d\_capital_i + \beta_9 d\_border_i + e_i \qquad (3)$$

The dependent variable is the growth rate of populations in 81 provinces (in the centre of province and sub-provinces) over the period of 2000-2012.

Regarding the explanatory variables, *ln_trade* represents the openness of province to trade in year 2000 and defined as *(exports+imports)/GDP*. *ln_indus* is the variable of specialization in industrial activities measured by its share in total employment. *ln_aggl* shows the level of agglomeration measured by the Real GDP of the province in 2000 divided into its land area (in meter squares). *ln_migr* is the net migration rate in year 2000 and *ln_fert* is the rate of fertility. (an average of 2009-2012 years used). *ln_crime* is the percentage of people that are penalized by court (average of 2007-2011 years used). *d_coast, d_border* and *d_capital* are the dummy variables capturing the effect of different locations (being on the coast line, on the border and capital city). The data for all variables is obtained from TUIK (Turkish Statistical Institute).[4] Finally, e_i represents the error terms which are assumed to follow a *NID(0,σ)* normal distribution with zero mean and constant variance.

Regarding the estimation methodology, we are aware of the fact that in urban and regional analysis, spatial dependence among cross sectional units is an important issue. Failing to take into account such interconnectivity might, in fact, create a serious bias for estimations.

So, we run the regression using OLS by including separately *ln_indus* and *ln_aggl* variables into the model since the inclusion of both creates a multicollinearity problem. Thus, we resort to two models; (1) and (2). Having estimated them, we test the presence of spatial autocorrelation using Lagrange Multiplier Error (LMerr), Lagrange Multiplier Lag (Lmlag) and SARMA tests.

In terms of spatial weights, we use three different adjency matrices (W2,W4,W6) in which neighboring cities are defined as the ones which are closer than 200km, 400km and 600km to each other respectively . The matrices are constructed in a way that if two cities are neighbors they take on value 1 and 0 otherwise.

The results are presented in Table 3. In all models and tests, positive spatial autocorrelation is evident regardless of the type of weight matrices used. Thus, it has been shown empirically that spatial dependence is a crucial issue which needs to be taken into account.

Table 3: Spatial Autocorrelation Tests

	Model (1)			Model (2)		
Test:	W200	W300	W400	W200	W300	W400
LMerr	6,19**	6,11**	4,82**	4,72**	4,84**	5,60**
Lmlag	6,04**	5,46**	5,13**	6,20**	6,47**	7,60***
SARMA	6,63**	6,46**	5,68*	6,20**	6,51**	7,75**

Note: ***indicates significance at 1 %, ** at 5 %, * at 10, LMerr:Lagrange Multiplier Error, Lmlag: Lagrange Multiplier Lag , SARMA : Spatial Autoregressive Moving Average

To do so, we consider two standard spatial regression models. First, we incorporate the spatial connectivity in error terms in a Spatial Error Model (SEM) and in this way, get rid of a possible bias driven (Anselin 1988). Such that;

$$e_i = \lambda W e_j \tag{4}$$

where λ captures the spatial dependence across the error terms of neighbouring cities *i* and *j*. *W* denotes the spatial weight matrices.

Second, we consider a Spatial Autoregressive Model (SAR) which assumes spatial connectivity in dependent variables. Such that the SAR model is specified as (Anselin,1988);

$$\ln \Delta pop_i = \alpha + \rho W ln\, \Delta pop_i + \beta_1\ ln\, trade_i + \beta_2\, ln\, indus_i + \beta_3\, ln\, aggl_i + \beta_4\, ln\, migr_i$$

$$+\beta_5\, ln\, fert_i + \beta_6\, ln\, crime_i + \beta_7 d\_coast_i + \beta_8 d\_capital_i + \beta_9 d\_border_i + e_i \tag{5}$$

where ρ captures the impact of population growth in neighboring cities on city *i's* population. We estimate the models using a Maximum Likelihood approach and present the

[4] GDP data at year 2000 has been obtained from Karaca (2004) and Kasman and Turgutlu (2009). Distance data between two cities is obtained from KGM (General Directorate of Highways).

results in Table 4 (Spatial Error Model) and in Table 5 (Spatial Autoregressive Model). Several interesting results emerge:

Table 4: Spatial Error Model (Determinants of City-size Growth), 2000-2012

	Model (1)			Model (2)		
Variables	**W200**	**W300**	**W400**	**W200**	**W300**	**W400**
λ	0,34**	0,43**	0,51**	0,32**	0,40**	0,52***
trade	0,033***	0,030***	0,032***	0,028**	0,025**	0,027**
industry	0,084***	0,081***	0,083***	-	-	-
aggl	-	-	-	0,047***	0,045***	0,047***
migration	0,0004*	0,0004*	0,0003	0,0004*	0,0004*	0,0003
fertility	-0,040	-0,048	-0,035	-0,017	-0,025	-0,016
crime_rate	3,565	5,087	4,181	9,285	10,055	8,451
coast_dummy	0,026	0,031*	0,032*	0,018	0,024	0,025
capital_dummy	0,051	0,038	0,021	0,041	0,030	0,008
border_dummy	0,016	0,016	0,005	0,018	0,019	0,007
N	81	81	81	81	81	81
AIC	-206,26	-205,35	-204,5	-198,56	-197,98	-198,53

Note: ***indicates significance at 1 %, ** at 5 %, * at 10%

Table 5: Spatial Autoregressive Model (Determinants of City-size Growth),2000-2012

	Model (1)			Model (2)		
Variables	**W200**	**W300**	**W400**	**W200**	**W300**	**W400**
ρ	0,26**	0,28*	0,31*	0,28**	0,33**	0,38**
trade	0,032***	0,031***	0,033***	0,028**	0,026**	0,028**
industry	0,078***	0,077***	0,078***	-	-	-
aggl	-	-	-	0,044***	0,043***	0,044***
migration	0,0004*	0,0004*	0,0003	0,0004*	0,0004	0,0003
fertility	-0,047	-0,048	-0,042	-0,024	-0,027	-0,022
crime_rate	0,784	-0,529	-1,563	5,731	3,870	2,046
coast_dummy	0,016	0,020	0,020	0,010	0,013	0,013
capital_dummy	0,037	0,023	0,013	0,034	0,020	0,007
border_dummy	0,014	0,013	0,011	0,014	0,013	0,010
N	81	81	81	81	81	81
AIC	-205,5	-203,98	-203,45	-199,3	-198,38	-198,54
LM Test	0,34	0,23	0,07	0,009	0,12	0,004

Note: ***indicates significance at 1 %, ** at 5 %, * at 10%

First, in all regressions, trade variable has a positive and significant coefficient regardless of the type of model and spatial weights used. So, it is firmly evident that cities which are more open to trade experience a higher population growth. One may, therefore argue that trade liberalization has favored the large metropolitan cities in Turkey which are possibly more open to trade. Thus, trade openness might be seen among the factors that contribute to the spatial concentration of populations. Given the availability of job opportunities in these areas, easy access to foreign markets, ports and other economic incentives, it is plausible that it attracts firms and laborers. As a consequence, an excessive urban primacy and uneven distribution of population exist within the country.

As a second result, specialization in industrial activities and agglomeration variable has a positive and significant coefficient in all regressions. It actually means that cities which include highly dense and concentrated economic activity with particular focus on industrial production (i.e. manufacturing) are likely to have higher population growth.

Third, spatial factors and connectivity among neighbor cities matter in all regressions. In SAR model, for instance, ρ is found to be positive and significant in all specifications. It means that population growth in one city is spilled over to the neighboring locations. This may happen through commuting patterns or migration flows.

Finally, with regard to other social and geographical variables, only net migration rate is found to be significant and positive while crime rate, fertility and other locational variables are found to be insignificant.

4. Conclusions

We investigated in this paper the recent tendencies of urban concentration and city size distribution in Turkey between 1965-2012 and the determinants behind city-growth. Our findings indicate three major conclusions.

First, urban concentration tends to increase recently, leading to an unevenly growing cities and creating urban giants (i.e. Istanbul). This result has been shown in section 2 using several illustrative analyses (i.e. maps and figures). Moreover, it has statistically been confirmed by Zipf's Law which does not hold after 2007.

Second, through a regression analysis, trade liberalization is shown to intensify this process since metropolitan places, which are likely to be more open to trade, tend to grow faster than others. Third, specialization of cities in industrial activities (i.e. manufacturing) and economies of agglomeration are likely to reinforce the spatial concentration of population around larger cities.

Finally, the results so far obtained provide important policy implications. First, the tendencies we have so far observed might be seen as an outcome of neoliberal urban policies (such as promoting trade and financial openness within the cities) which have led to the population agglomerations. Thus, policy makers should bear this in mind and approach with a caution to such policies.

Second, to be able to overcome the uneven urban development induced by liberalization, authorities should distinguish between two scales of policies; the centrally decided ones and the local policies. At the national scale, openness and liberal policies should be approached with a caution while alternative policy tools, i.e. tax incentives and public subsidies, can be directed towards backward regions to stimulate the entrepreneurship and investment, hence, attract the firms and laborers to these areas. Some examples of these regional development programs are GAP (Southern Anatolian Project) and large organized industrial zones in many Anatolian cities, State Development Agencies and rural development programs which are still ongoing and aimed to extract the local potentials and enhance the sustained rural life against migration.

At a local scale, several policies can be implemented. For instance, improvement of the physical and virtual infrastructure, education and health services, housing and other social problems might well contribute to the development of rural areas and hamper the out migration.

Overall, perhaps the most crucial lesson we get is that uneven development in urban areas is accompanied by liberal trade policies which needs a deep consideration of additional policies in action.

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