Urban Dynamics in Turkey

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Abstract

This paper investigates the evolution of urban population in Turkey in the second half of twentieth century. During this period Turkey had high population growth rate and experienced rapid urbanization. While population in large cities increased drastically, there is also ample evidence of new emerging centers. Towards the end of the century, Turkish urban system is dominated by large number of small and very few large cities. The main determinants of the city growth are both of the first nature, being a coastal town, and of the second nature, having a large market potential.

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1 Introduction

It is a known fact that cities of different sizes co-exist. The urban literature explains the differences in relative city sizes by the interaction of two opposing forces. Firms concentrate geographically to enjoy benefits of agglomeration, either because of external scale economies arising from intra-industry spillovers as in Henderson (1974), or because diversification of industry enables firms to exploit Jacob-type externalities, or upstream-downstream linkages ties firms in an geographical area as explained in Fujita et al. (1999). On the other hand, urban concentration generates diseconomies, such as commuting costs, environmental problems etc. The extent of the benefits relative to the costs determines the industry composition and sizes of cities.

A strand of urban growth models assume exogenous productivity. In these models, resource endowments determine initial productivity differential and factor returns vary across locations. With no barriers, the movement of factors will equate factor returns, and cities will grow at differential speed until they reach steady state and thereafter all cities grow at the same rate.

Alternatively, in Eaton and Eckstein (1997) and Black and Henderson (1999) there is endogenous human capital accumulation in a system of different types of cities. With knowledge spillovers and local information, each type of cities grow at the same rate. In addition, with a sufficiently high population growth, the number of cities increase. Abdel-Rahman and Fujita (1993) also model diversified and specialized cities existing simultaneously in a system, with the former being larger. Changes in industrial structure determines which type of cities grow faster, and thus shapes the evolution of city-size distribution. Duranton and Puga (2000) introduce urban product-cycles; new products are developed initially in large diversified cities and once products and production processes are standardized, production is decentralized to low cost small cities.

This paper analyzes, in the light of theoretical models, the city-size distribution and its evolution in Turkey between 1950 and 2000. Turkey is a developing country, on the transition path from agricultural to industrial society. The move away from traditional society changes the role of cities from merely a service provider to innovation bases and engines of growth. Indeed, as Turkish per capita income tripled in the last fifty years, the urbanization rate reached 60% up from 25% in 1950.

Moreover, Turkey has a significantly young population. In 2000, more than 50% of the population was under the age of 25. Urban centers attracts young labor force as they provide new and better employment opportunities, causing a further push for urbanization. Altogether these facts generate a geographically dynamic society. According to Population Census data, from 1970 onwards, every five years 7% of the population has moved from one province to another[1] and while early flow of population was from rural areas to urban centers, after 1985 the dominant type of migration became from urban centers to other urban centers.

Over the fifty years examined here, Turkey implemented liberal policies, switched to import-substituting industrialization and then to export-promoted growth. Each of these changes in the policy affected the development of cities as each had different implication for urban development. Thus, the rich Turkish experience may broaden our understanding of urban dynamics.

2 Data

Turkey was a relatively poor agricultural society at the mid twentieth century. In 1950, Turkey had a population of 21 million (Table 1). Per capita income was around 548 YTL (1987 constant values) or $640 (in 1987 constant dollars). The share of agriculture constituted 42% of total production and 84% of total employment. Over the next fifty years population increased at an annual rate

[1]The figure excludes intra-provincial migration.

of 2.35% and reached 68 million in year 2000. At the same time per capita income tripled, the share of agriculture declined to 14% in output and 36% in employment. Human capital also increased significantly. As of 1975, number of years an average Turkish citizen attended school was 2.7 years. This number doubled in the next quarter century. The shift from agriculture to industry and services, on the other hand, decreased labor force participation and increased average unemployment rate. During the same period a significant amount of people migrated, first, from rural areas to urban centers, and later on, between urban areas. The high population growth and significant changes in the sectoral composition of output had a significant effect on city growth.

Unfortunately there is no clear-cut definition of city or metropolitan area in Turkey as in the US. The urban system in Turkey is based on an administrative hierarchy. On top of the pyramid there are provinces (il). Each province is divided into several counties (ilçe), with one being the central county. The counties are then divided into districts (bucak) and then to villages. Each county, and some districts have a center, a municipality.

In the urban literature the definition of a "city" is based on density. However, the State Institute of Statistics of Turkey (SIS) uses the political definition of city and defines provincial centers and county centers as "urban" areas. The urbanization rate reported by the SIS, then, refers to the ratio of people living in these "centers" to total population.

There are several problems with this definition. The administrative structure allows exploitation of the concept of "urban center" by politicians. Although the county borders are not changed beyond some minor redrawings, the borders of municipalities (county centers) changed significantly to incorporate new settlements around the centers. Usually, before every elections the definition of a municipality changes either leading establishment of new municipalities, or altering borders of existing municipalities. Consequently, the official definition of "urban centers" includes very small settlements. For example, in year 2000, among the 923 county centers, 14 of them had a population less than two thousand, with the smallest county center having a population of merely 683.

A second problem is that major provincial centers[2] consist of several smaller contiguous municipalities that are grouped under Metropolitan Municipalities. The borders of these small entities have altered significantly over time. The third problem arises with the use of historical data. In early years, even province centers had very small population figures. In 1950, for instance, six province centers out of 81 had a population less than five thousand, 17 less than ten thousand and 47 less than twenty thousand.

How can one, then, define a "city" in Turkey? The definition based on county centers does hardly qualify as some of these county centers have too few population to be considered as cities. Defining "city" as a center with 50,000 and more population as in the US leaves very few cities: only 11 cities in 1950, 60 in 1980 and 127 in 2000. The data in this paper is collected form General Population Censuses at the beginning of every decade since 1950, and covers county centers with population over 10,000. Therefore, any definition of a city as a settlement with a population less than ten thousand is not possible due to data limitations. This threshold is, in fact, chosen by the SIS when reporting employment statistics where an "urban settlement" was defined as a center with population over 10,000. The definition has changed in 1990 to centers with population more than 20,000.

Following the employment statistics, a "city" is defined as a county center (including province centers and combined Metropolitan Municipalities of major provinces) with populations 10,000 and more and the set of cities that satisfy this requirement is denoted as Sample A. To test the robustness of the results, a second definition of a "city" is adapted. Only those centers with

[2]There are eight of them: Adana, Ankara, Bursa, Gaziantep, Istanbul, Izmir, Kayseri and Konya.

20,000 or more population are included and the second set is denoted as Sample B. Consequently, while the official urbanization rate was 18.5% in 1950 and 61.5% in 2000, in these data sets the urbanization rates are 14.5% and 65% in respective years in Sample A, and 25% and 57.5% in Sample B.

Statistics about the population size of these two data sets are provided in Table 2. In Sample A there were 102 cities in 1950. The number of cities reached 469 in 2000. The average city size increased from 38,000 to 89,000 while the median city size declined from 45% to 29% of the mean. In Sample B, the number of cities increased at a higher rate, from 41 in 1950 to 278 in 2000, however the average size increased at a lesser rate. Regardless of the sample used, in the observed 50 years, there is significant amount of new entry; particularly between 1950 and 1960 when rural to urban migration was dominant. The entry rate declined in later years, except 1980s which is marked by the opening of the economy to free trade.

Kernel density estimates of the population distributions at the beginning and at the end of the sample period is given in Figure 1. The distribution is shifting to the right as mean city size grows. Therefore, the distribution of relative city sizes (deviations of log population from its mean) are estimated and plotted. The 1950 distribution is right skewed and has two lumps at the higher end of the distribution. In 2000, there are more cities at the lower end and fewer at the middle range, possible due to entry of new smaller cities, and the lumps at the higher end are smoothed out. Although not reported here, the distribution is quite stable since 1960[3].

3 The Evolution of City Size Distribution

This section analyzes the spatial evolution of city size distribution in Turkey over time. First Zipf's Law is applied to both data sets, and then, following

[3]The plots of distribution in each decade is available upon request.

Eaton and Eckstein (1997), a more nonparametric approach to examine the mobility of cities and to characterize the evolution is implemented.

3.1 Zipf's Law

Zipf's Law refers to a statistical regularity that seems to be consistent across countries and time between the sizes and ranks of cities. Auerbach (1913) suggested that the city size distribution can be approximated by a Pareto distribution, $y = Ax^{\alpha}$, where x is the population size, y is the rank of the city, and A and α are constants. The Zipf's Law (Zipf, 1949) or the rank-size rule is a special case where the parameter α is equal to unity. Accordingly, when the rank of a city is multiplied with its corresponding rank, the product will be a constant number, namely A.

Testing Zipf's Law amounts to estimating the following equation:

$$ln(y_{it}) = lnA_t - \alpha_t ln(x_{it}) \tag{1}$$

for city i at time t and then testing whether the coefficient α is equal to one.

Eaton and Eckstein's (1997) estimates of the coefficient α for France and Japan is very close to one. They also found that the coefficient has increased over time, that is the inequality of city size declined in these two countries. In contrast, Dobkins and Ioannides (2000) and Black and Henderson (2003) found that the coefficient is significantly lower than unity in the US. Furthermore, both studies report a decline in the coefficient by using decade by decade re-estimation of the equation. Soo (2005), on the other hand estimated Zipf's Law for a large set of countries. His findings indicate that for majority of countries the Law is rejected, the average of the estimates is around 1.1. In particular, he finds that in developed countries the coefficient estimate is larger than less developed or developing countries.

The decade by decade estimation results of Equation (1) is given in Table 3. In the estimation equation, following Dobkins and Ioannides (2000), instead of rank the proportion of cities with size greater than or equal to x_{it} is used. The estimates of the coefficient α steadily decline from 1.19 to 0.95 in Sample A with a large jump in 1960. The estimates also decline over time when Sample B is used, but there is an increase initially in 1960. Furthermore, in each decade the coefficient estimate using Sample B is larger than the estimate in Sample A, except in 1950.

Gedik (2003) also reports a differential speed of growth of small and large cities in Turkey between 1950 and 1960[4]. She refers to faster growth of smaller cities as pre-concentration phase of urban development. One potential explanation for the observed phenomenon could be that early migration from rural areas were to nearby urban settlements rather than already existing large agglomerations. Regardless, there is a tendency of increasing inequality of city size in Turkey, despite the coefficient estimates are close to unity. It must also be noted that this finding is in contrast to Turk and Dokmeci (2001) where they found parallel growth of 'city centers' between 1980 and 1997. Unfortunately, they do not provide their definition of 'city' and thus a comparison is not possible.

3.2 Markov Processes

Zipf's Law provides a general description of the size distribution of cities in Turkey. Nonetheless, it is not informative about intra-distribution dynamics; whether relative position of cities did change or weather mobility within the distribution has declined over time. The statistical method proposed by Quah (1993) characterizes the dynamics of entire distribution and suitable to provide answers to these questions. The distribution of city-sizes, f_t is assumed to follow a first-order autoregressive Markov process:

$$f_{t+1} = M(f_t, U_t) \qquad (2)$$

[4]She examines the evolution of population centers with 125,000 and more population in her study

where M is an operator that maps (f_t, U_t) into a probability measure. Drawing upon Dobkins and Ioannides (2000), I am using an adapted version of Eq. (2) that allows for new cities entering with a probability distribution ε_t. Defining i_t to be overall net entry rate, the ratio of total number of new entrants to the total number of cities at $t+1$, the model can be rewritten as:

$$f_{t+1} = (1 - i_t)M_t f_t + i_t \varepsilon_t \tag{3}$$

where M_t is the transition matrix of existing cities and ε_t is the frequency distribution of entrants.

Letting M_t, i_t and ϵ_t be time invariant, iteration of equation (3) backwards yields:

$$f_t = (1 - i)^t M^t f_0 + \sum_{\tau=1}^{t} [(1 - i)M]^{i-\tau} i \varepsilon_\tau \tag{4}$$

where f_0 is the initial distribution. Notice that, when entry rate is zero, the homogenous solution dominates; if not, the particular solution cannot be ignored, and the larger is i the less important is the initial conditions.

Indeed, in the data sets used here the entry rate is quite high ranging from 11% to 37% in Sample A and from 18% to 47% in Sample B[5]. These numbers suggest non-stationarity series. Therefore, the estimated transition matrices will only be used to note certain key aspects of the evolution of city-size distribution in Turkey.

Table 4 provides the average of decade by decade estimated transition matrices. The cells are defined as 0.30, 0.50, 0.75, 1.00, 2.00, and 20.00 times the average in each decade to make it comparable with Eaton and Eckstein (1997) and Dobkins and Ioannides (2000). Each cell denotes the transition probability from a particular category in the initial year (in columns) to a particular category in year $t+1$ (in rows).

[5]Specifically, the net entry rates are $i_{1960} = 0.3014$, $i_{1970} = 0.3707$, $i_{1980} = 0.2468$, $i_{1990} = 0.2649$, $i_{2000} = 0.1066$, in Sample A; and $i_{1960} = 0.4744$, $i_{1970} = 0.2909$, $i_{1980} = 0.2903$, $i_{1990} = 0.3231$, $i_{2000} = 0.1763$, in Sample B.

The large values for diagonal entries indicate high persistence. However, the diagonal entries at both extremes of the distribution are larger than the diagonal entries for categories in the middle. In contrast to Eaton and Eckstein (1997), and to certain extent to Dobkins and Ioannides (2000), small and large cities display higher persistence than middle-sized cities.

Furthermore, the entries above diagonal are larger than the entries below the diagonal, namely, at any point in time, the probability to move into a lower category is larger than to move to an upper one. To measure general mobility within the distribution, Shorrocks (1978) has developed an index. Using estimated decade by decade transition matrices, mobility indices are calculated for both samples over time and are shown in Table 5. In neither case there is an indication of decreasing mobility. In general, mobility in Sample A, where smaller entities are also included in the set, is larger than Sample B. Mobility is more pronounced among smaller sizes.

The steady-state distribution is also estimated using average transition matrix and assuming no entry. The ergodic distribution shows a large concentration at the lower end. There is no indication of convergence and there will be only very few cities over average population. This finding is close to France and Japan than the US, despite Turkish case involves significant amount of new entry as the latter. With new entering cities, Turkish urban system seems to be one of many small cities and only very few large ones.

3.3 Dynamics of City Growth

The transition analysis in the previous subsection assumes identical units. However, the evolution of each city depends on numerous factors that are grouped into 'first nature', the climate, coastal location etc., and 'second nature', agglomeration economies, in the literature. To test the extent these factors affect population growth a simple regression is estimated:

$$\Delta ln(P_{i,t+1}) = \delta_i + \delta_t + \beta X_{i,t} + \gamma ln(P_{i,t}) + \epsilon_{i,t} \quad (5)$$

where $\Delta ln(P_{i,t+1})$ is the change in population of each city i at time period t. δ_t controls for common time effects, nationwide shocks, and δ_i takes care of individual effects. $ln(P_{i,t})$ is added to the equation to control for mean reversion in population sizes and it describes the convergence to long-run size of each city conditional on its characteristics. X_{it} contains time varying and time invariant variables.

Many potential variables that could be included in the vector X had to be left out due to data limitations. Nonetheless, a set of interesting variables are available after 1990. Thus, the analysis is carried out, first, using historical data but limited number of variables and then using extended set of variables but only growth in the last decade.

The first set regression results are reported in Table 6. In columns (1) and (4) pooled OLS results with time dummies are presented. The coefficient in front of lagged population is positive regardless of the sample used, though insignificant in Sample B. The model is extended by including a dummy variable that indicates whether the city is located near to sea (or lake) coast. The adjacent columns show results of this specification. A city located close to the sea is expected to grow faster, and this is confirmed by the data.

To test the importance of the 'second nature', a variable measuring market potential is included in the regression, following Black and Henderson (2003). The market potential variable that is assumed to represent external economies is defined as:

$$m_{j,t} = \sum_{i \neq j} \frac{P_{i,t}}{d_{i,t}} \tag{6}$$

where i and t denotes city and time, respectively, P is population and $d_{i,t}$ is the distance of city i from city j measured as the sum of distances between city centers and respective provincial centers of both cities, plus the distance between the two provincial centers. In the regressions normalized version of this variable is used:

$$M_{j,t} = \frac{m_{j,t}}{m_t} \tag{7}$$

The model is estimated using fixed effects and results are presented in columns (3) and (6). There is significant and quadratic relationship between market potential and growth of a city. As the theory suggest, higher market potential induces higher growth, but if the city is located in very high market potential area competition reduces this effect. Given the statistics on market potential[6], a one standard deviation increase in market potential increases decade growth rate 2.5% to 4.1%, a significant amount given that average decade growth rate of urban population in the sample is 5%.

There are other variables that could affect the growth of a city. Using data from 1990 Census, the population growth equation is re-estimated including a few variables alongside the market potential. Initial values of literacy rate, shares of manifacturing and agriculture in total employment, unemployment rate and dependency ratio is added to the equation. The first variable is intended to capture human capital and the second and third to control for sectoral shift. Urban unemployment rate and dependency ratio measure tightness of labor markets. The estimation results are given in the first two columns of Table 7. Cities that were more agriculture oriented and had larger unemployment rates seem to grow much less than the other. Cities with larger share of dependent population, or smaller working age population tend to grow faster. The literacy rate has positive but insignificant coefficient in Sample A, and negative and significant coefficient in Sample B where threshold for city size is held higher. This surprising finding could be related to fertility rate that was not available to include in the regression.

[6]The mean is 1.01 and standard deviation is 1.03 in Sample A; and 1.01 and 0.44, respectively in Sample B.

4 Conclusion

This paper documented the evolution of cities in Turkey between 1950 and 2000. The distribution of city-sizes is right skewed and quite stable, especially after 1960. However, there is significant amount of intra-distributional dynamics, particularly in the middle-range of the distribution, despite high number of new cities emerge over years. Moreover, the mobility shows no tendency to decline.

There is also evidence that both the first and the second nature play an important role in determining the sizes of cities. Coastal cities tend to grow faster, as well as cities that are located near larger markets. The positive effect of market potential is quite sizeable, yet it dies out as it gets too large and attracts competition.

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Table 1: Descriptive Statistics: Developments in Turkey

	1950	1960	1970	1980	1990	2000
Population (in thousands)	20,947	27,755	35,605	44,737	56,473	67,804
GDP p.c. (1987 prices, Thousand YTL)	548	764	948	1,124	1,480	1,752
GDP p.c. (1987 prices and Exch. Rates)	640	892	1,107	1,312	1,727	2,044
Share of Man. in GDP	14.6	17.4	17.2	19.3	25.5	23.3
Share of Agr. in GDP	41.9	38.0	37.4	26.1	17.5	14.1
Share of Man. In Emp.	5.5	7.0	10.3	13.1	14.2	16.9
Share of Agr. In Emp.	84.3	74.1	63.2	53.2	46.9	36.0
Education (Years of Schooling)				3.2	4.6	5.6
Unemployment (12+)	1.5	3.1	6.4	8.3	8.2	6.5
Labor Force Participation (12+)	66.0	68.5	63.8	59.6	53.5	45.9
5-Year Between Provinces Migration Rate				6.1	7.2	6.9

Table 2: Descriptive Statistics: Urban Growth

	Sample A: Cities with 10,000+ Population				
	Growth of Urban Pop. (%)	**Number**	**Mean**	**Median**	**Net Entry Rate**
1950		102	37,967	16,900	
1960	5.94	146	48,039	20,278	0.3014
1970	5.27	232	51,215	18,568	0.3707
1980	4.27	308	59,150	20,048	0.2468
1990	5.36	419	74,120	21,506	0.2649
2000	2.91	469	88,792	25,093	0.1066
	Sample B: Cities with 20,000+ Population				
	Growth of Urban Pop (%)	**Number**	**Mean**	**Median**	**Net Entry Rate**
1950		41	74,068	35,240	
1960	6.95	78	78,047	33,866	0.4744
1970	5.19	110	93,006	34,843	0.2909
1980	4.52	155	103,707	40,736	0.2903
1990	5.73	229	124,514	40,481	0.3231
2000	3.12	278	140,172	45,494	0.1763

Table 3: Estimates of Pareto Distribution

	Sample A: Cities with 10,000+ Population						
	Pseudo Pareto Distribution				True Pareto Distribution		
	Constant	**α**	**Std.Err(α)**	**R-squared**	**α**	**Std.Err(α)**	**R-squared**
1950	10.887	1.189	0.017	0.980	1.022	0.002	0.961
1960	10.190	1.103	0.009	0.990	1.007	0.001	0.982
1970	9.916	1.078	0.005	0.995	1.009	0.001	0.990
1980	9.496	1.029	0.004	0.996	1.001	0.000	0.996
1990	9.099	0.985	0.003	0.996	0.996	0.000	0.996
2000	8.871	0.950	0.004	0.992	0.983	0.000	0.991
	Sample B: Cities with 20,000+ Population						
	Pseudo Pareto Distribution				**True Pareto Distribution**		
	Constant	**α**	**Std.Err(α)**	**R-squared**	**α**	**Std.Err(α)**	**R-squared**
1950	10.619	1.083	0.035	0.961	1.016	0.003	0.957
1960	10.915	1.112	0.016	0.984	1.018	0.001	0.977
1970	10.844	1.094	0.011	0.988	1.007	0.001	0.982
1980	10.516	1.059	0.006	0.994	1.003	0.001	0.992
1990	10.176	1.027	0.005	0.996	1.002	0.000	0.995
2000	10.182	1.019	0.004	0.996	0.993	0.000	0.995

Table 4: Average Transition Matrices

Sample A: Cities with 10,000+ Population

	Upper End Points						
	0.3	***0.5***	***0.75***	***1***	***2***	***20***	**Fin Distr.**
0.35	89.6	22.2	0.0	0.0	0.0	0.0	50.2
0.5	10.0	68.1	29.8	0.0	0.0	0.0	18.8
0.75	0.4	9.3	62.4	30.8	0.8	0.0	11.8
1	0.0	0.4	7.8	49.9	15.1	0.0	5.6
2	0.0	0.0	0.0	19.3	79.4	5.7	6.3
20	0.0	0.0	0.0	0.0	4.8	94.4	7.2
Init Distr.	15.7	41.2	15.7	12.7	8.8	5.9	102/414
SS Distr.	55.9	26.2	9.4	2.6	3.2	2.7	

Sample B: Cities with 20,000+ Population

	Upper End Points						
	0.3	***0.5***	***0.75***	***1***	***2***	***20***	**Fin Distr.**
0.35	88.4	25.5	0.0	0.0	0.0	0.0	44.1
0.5	11.6	68.0	28.6	0.0	0.0	0.0	26.6
0.75	0.0	6.5	62.7	27.7	1.2	0.0	10.5
1	0.0	0.0	8.7	63.6	9.3	0.0	4.4
2	0.0	0.0	0.0	8.7	83.7	1.3	7.4
20	0.0	0.0	0.0	0.0	5.8	98.8	7.0
Init Distr.	12.2	51.2	14.6	7.3	7.3	7.3	41/229
SS Distr.	65.6	20.8	7.9	1.9	2.3	1.5	

Table 5: Mobility

	Sample A	**Sample B**
1950-1960	0.3217	0.1495
1960-1970	0.2859	0.3395
1970-1980	0.3199	0.2301
1980-1990	0.3481	0.3361
1990-2000	0.2872	0.2934
1950-2000 Average	0.3126	0.2698

Table 6: Determinants of Population Growth

	Sample A			Sample B		
	(1)	(2)	(3)	(4)	(5)	(6)
P_{t-1}	0.0019 (0.0006)***	0.0017 (0.0006)***	-0.0423 (0.0025)***	0.0012 (0.0008)	0.0009 (0.0008)	-0.0386 (0.0037)***
Coast		0.0069 (0.0016)***			0.0064 (0.0019)***	
Mrkt. Pot.			0.2113 (0.0486)***			0.1550 (0.0538)***
Mrkt. Pot. Sq.			-0.0562 (0.0177)***			-0.0387 (0.0193)**
R-squared	0.13764	0.15117	0.39104	0.20429	0.21970	0.44084

All specifications include time and regional dummies.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7: Determinants of City Growth

	Dep. Var.: Change in log Pop.	
	Sample A	Sample B
P_{t-1}	-0.0001 (0.0012)	-0.0013 (0.0015)
Coast	0.0082 (0.0028)***	0.0048 (0.0031)
Mrkt. Pot.	-0.0167 (0.0122)	0.0077 (0.0117)
Mrkt. Pot. Sq.	0.0065 (0.0038)*	-0.0007 (0.0031)
Literacy	0.0109 (0.0261)	-0.1228 (0.0341)***
Share of Man.	-0.0123 (0.0122)	-0.0067 (0.0141)
Share of Agr.	-0.0228 (0.0082)***	-0.0341 (0.0129)***
Unemp.	-0.0349 (0.0202)*	-0.0379 (0.0271)
Dep. Ratio	0.0444 (0.0125)***	0.0051 (0.0177)
R-squared	0.14845	0.22183

All specifications include time and regional dummies.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Figure 1a: Kernel density Estimates: Sample A, Cities with Population 10,000 and More

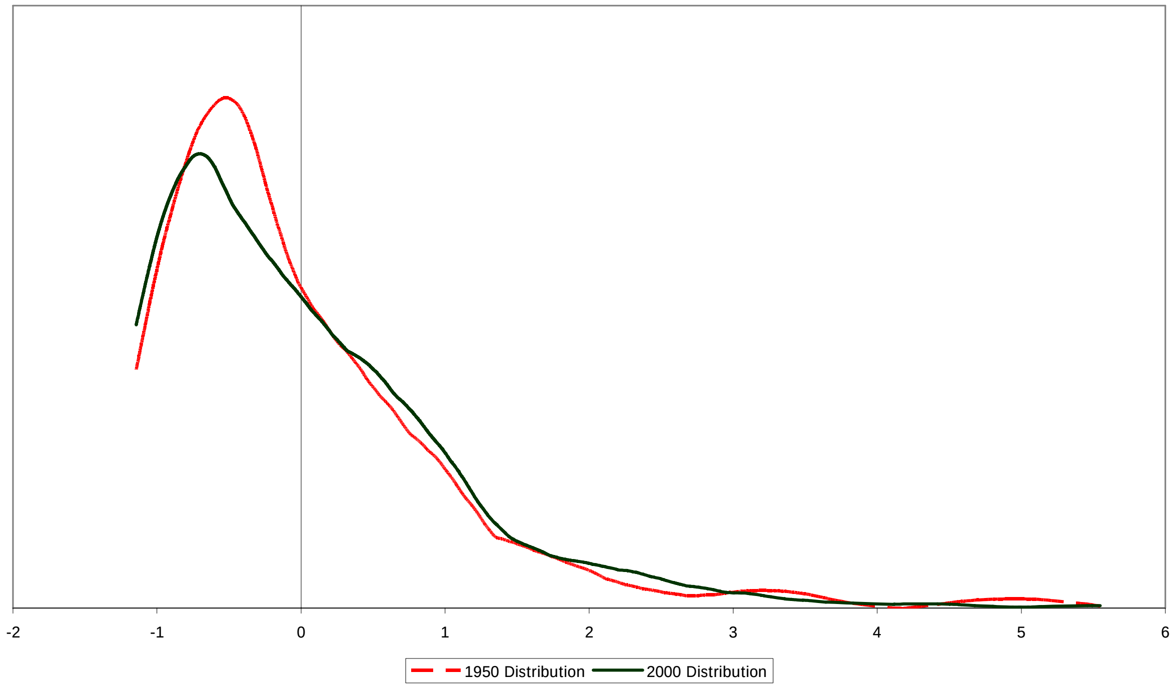

Figure 1b: Kernel density Estimates: Sample B, Cities with Population 20,000 and More