SEQUENTIAL CITY GROWTH IN THE U.S.

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ABSTRACT

The aim of this paper is to provide empirical evidence on the dynamics of the city size distribution. We use data for the United States throughout the twentieth century on two geographical units: cities, understood as incorporated places, and metropolitan areas. We focus our analysis on the new cities that enter in the distribution during the period. The main contribution of the paper is the specific study of these "new cities" in terms of population growth. Our results enable us to confirm that, when cities appear, they grow very rapidly and, as decades pass, their growth slow down or even decline. This is consistent with the theoretical framework obtaining mean reversion (convergence) in the steady state and with the new theories of sequential city growth.

Keywords: cities, sequential city growth, city size distribution

JEL classification: O18, R11, R12

1. Introduction

The evolution of city size distribution has attracted the attention of many researchers over a long period of time. It is an important issue especially when talking about the United States (US) because of its relatively recent urban development. Over the last decades of the nineteenth century and all the twentieth century, the US saw an important transition from a rural to an urban society. As Kim and Margo (2004) point out, the first fifty years of the 20^{th} century, the number and size of cities increased rapidly. Moreover, these cities were geographically concentrated where industrialization began. However, in the second half of the twentieth century, this pattern changed. From 1960 to 1990, the largest cities had a decrease in the number of population, basically because population moved away from the city centres and began the phenomenon of suburbanisation, becoming more important the notion of metropolitan area.

There exists a huge amount of literature, explaining which city size distribution holds in the steady state behind this growth pattern. There are two main empirical regularities explaining this fact: the Zipf's law and the Gibrat's law. The first implies that city sizes follow a power law such that the largest city is twice as large as the second-largest, three times as large as the third-largest city, and so on (see Gabaix and Ioannides, 2004 for a further explanation). Alternatively, Gibrat's law postulates that the growth rate of the population is independent of its initial size. Gabaix (1999), from a theoretical perspective, points out that, whatever the specific determinants of cities' growth are, as soon as they satisfy Gibrat's law, their distribution will converge to Zipf's in the steady state.

There are several papers that try to find out which of those empirical regularities holds in the US context. Some authors like Krugman (1996) use data on US metropolitan areas in a cross-sectional analysis, showing that Zipf's law works for one specific year. Others like Ioannides and Overman (2003) focus their attention on the dynamics and conclude that Gibrat's law holds while others like Black and Henderson (2003) reject this hypothesis. An important finding is the result from Eeckhout (2004) which demonstrates that Gibrat's law explains city size distribution when taking into account the entire sample while Zipf's law only works for the upper tail of the distribution. Moreover, Reed (2002) finds a generalized distribution in the steady state that can reconcile Zipf's and Gibrat's law. Using the same database as ours, González-Val (2010) also find that Gibrat's law holds in mean growth rates, when using information of all the cities, and Zipf's law only when restricting the sample at the top biggest ones.

However, while in many of these studies the number of cities or metropolitan areas has been considered constant, there have been some others that allow for the entrance of new cities in the sample. Some authors, as Gabaix and Ioannides (2004), wonder what would happen to city size distributions when new cities emerge. Dobkins and Ioannides (2000) try to address this issue. They allow for some cities to enter in the sample but only when they reach the 50,000 inhabitants threshold because they use metropolitan area's data.

The entrance of new cities is especially important in the US case because of its enormous development during the 20th century. At the beginning of the period there were 10,499 cities while in 2000 there were 19,229. The number of cities has almost doubled from 1900 to 2000. And, apart from the increase in the number of cities, their population has grown as well. There are some cities that, by the beginning of the century already existed. This is the case of New York, Detroit, Los Angeles or Miami. These four cities grow more during the first half of the century, but the growth rates are higher for the cities from Miami and Los Angeles. This is due to the fact that New York and Detroit were created at the beginning of the 19th century while Los Angeles and Miami are relatively new cities in 1900. In fact the initial population of Miami in 1900 was only 1,681 inhabitants, while in 2000 the city has 362,470 inhabitants. The second half of the century is also different for those four cities. New York moderates its growth, from rates between 40% and 35% in the first half to others from 3% to 1% during the second part. The case of Detroit is even more illustrative: in the second half of the 20th century, the city decreases between the 22% and the 7%. On the other hand, Miami and Los Angeles still increase with significant growth rates: 25% to 15% and 26% to 16%respectively.

Apart from the cities that already exist at the beginning of the period, there are lots of other cities that appear in the US geography during the 20th century. An example could be the case of Boca Raton, which entered the US system in 1930 growing at 48% and increasing this growth rate until 1960, where it starts slowing down until 19%. There are many other cities that do not exist on 1900 but they do so on 2000 because they appear in any of the hundred years in between. In fact, we are interested in study how this "new cities" behave.

This growth pattern illustrated by the examples above is what literature has called the sequential city growth. There are authors like Cuberes (2011) which tests a model of sequential city growth (see Cuberes, 2009) in which cities grow sequentially meaning that, within a country, the largest cities are the first to grow. At some point this growth slows down and the next-largest cities start to grow and so on. His results point out that historically, urban agglomerations have followed a sequential growth pattern. Henderson and Venables (2009) also present a model in which cities grow sequentially, allowing for the entrance of new cities in the sample but taking into account immobility of housing and urban structure. They also show that efficient formation of cities involves local government intervention to finance development.

Our research comes within the framework of this sequential city growth literature. We are interested in analyze how this new cities enter in the sample in terms of population growth. According to this literature, when those cities appear, they should grow faster and, as time passes, they become more mature and they slow down their growth or even decrease. We test empirically this issue with parametric and non-parametric methods. Moreover, we are interested, not only in the dynamic part of the analysis, but also in a long-term interpretation. According to Black and Henderson (2003) and Henderson and Wang (2007), there exists mean reversion when arriving to the steady state and therefore Gibrat’s law is rejected. Our results are consistent with their findings.

We use data on US cities and metropolitan areas in order to analyze how they grow when they enter in the sample and which is their evolution. To our knowledge, this is the first paper that analyzes the growth patterns of these new cities (and metropolitan areas). Our results show that when cities appear, they grow rapidly and then their growth rate slow down and finally decrease. As incorporated places are the definition of legal cities, we are interested in replicating the analysis for metropolitan areas because they represent more natural economic areas than cities. However, the results do not confirm our hypothesis. It could be due to the fact that a metropolitan area is an aggregation of different cities. Even if the area is new, the cities within it might not be new. Moreover, you do not know how old the area is because it does not appear in the sample until it reaches the minimum population threshold. So larger cities, which are more mature, have lower growth rates than smaller cities and the aggregate effects may disappear.

The structure of the paper is the following. Section 2 presents the data. Section 3 explains the empirical methodology. In section 4 we discuss the main results. Section 5 provides the non-parametrical analysis and section 6 concludes.

2. Data

In this paper, we use data on cities and Metropolitan Statistical Areas (MSAs) for the US during the 20th century. The database is the same as the one used by González-Val (2010) adding a few periods for the MSAs dataset. The information of both geographical units was obtained from the annual census published by the US Census Bureau.

First of all, we should take into account that there is not just one way when defining a "city". For our analysis we use incorporated places. According to the census, an incorporated place is *a type of governmental unit incorporated under state law as a city, a town (except New England, New York and Wisconsin), a borough (except in Alaska and New York city), or a village and having legally prescribed limits, powers and functions*. The Census Bureau recognizes incorporated places in all states except Hawaii, so we do not include it in our sample. Moreover, we exclude Puerto Rico and Alaska due to the fact that these states (also Hawaii) were annexed during the second half of the 20th century. As Eeckhout (2004) shows in his paper, it is important to take into account the whole sample without size restriction (truncated distributions can lead to biased results), so we include all the incorporated places from the census for each decade.

We also use data on MSAs in order to take into account for those people that live outside incorporated places and to compare results between both geographical units (cities and MSAs). As Ioannides and Overman (2003), for the period from 1900 to 1950 we use data from Bogue's Standard Metropolitan Areas (1953). He took the definition of SMAs (Standard Metropolitan Areas)[1] for 1950 and reconstructed the population for the period from 1900 to 1940. This means that some of the SMAs in 1900 were smaller than the 50,000 inhabitants' threshold, so we exclude them until they reach that cutoff. For the period 1950 to 2000 we took the MSAs data published by the Census Bureau.

As Glaeser and Shapiro (2003) point out, MSAs are multi-county units that capture labor markets, so we can interpret them as much more economic units than places. But there

[1] The definition of a metropolitan area was first issued in 1949 under the name of Standard Metropolitan Area (SMA). It changed to Standard Metropolitan Statistical Area (SMSA) in 1959 and in 1983 was replaced by Metropolitan Statistical Area (MSA).

is one problem on the use of MSAs instead of places that arises directly from their definition. A MSA usually comprise a group of counties that require a central city with a minimum of 50,000 inhabitants (this criterion has changed over the period of analysis), so we can conclude that only larger cities are considered. As we said before, we want to include all the data without size restrictions in our sample so we need more than just the largest cities.

There is another more specific problem on the use of MSAs for our analysis. As Dobkins and Ioannides (2001) show, the US system is characterized by the entry of new cities that could affect the city size distribution. As we are interested in these cities particularly, using data on incorporated places provides more information than using only the MSAs data. However, as we said before, MSAs are bigger geographical areas and include a large proportion of the population living in rural areas. But, despite the sample of incorporated places covers a lower percentage of the total population, it is almost entirely urban (94.18% in 2000) compared with the urban population in the MSAs (88.35%).

Table 1 shows the summary of statistics for the population of incorporated places in each decade of the period of analysis. Table 2 presents the same summary statistics, but for MSAs, where we can see the minimum threshold of 50,000 inhabitants. At first glance, we can observe that the number of existing cities and MSAs is increasing over time. It is so their size. What these tables are showing is the urbanization process that the US experienced during the past century. The number of cities in 2000 is almost twice the one in 1900 and more than twice for MSAs. It means that the appearance of new units (cities or MSAs) is important when studying the US population growth process.

Table 1. Descriptive statistics of Incorporated places

Year	Cities	Mean Size	Standard Deviation	Minimum	Maximum
1900	10,499	3,467,335	42611.45	7	3,437,202
1910	13,580	3609.59	50343.25	7	4,766,883
1920	15,076	4,086,834	57534.99	3	5,620,048
1930	16,189	4,769,608	68449.72	1	6,930,446
1940	16,406	4,975,686	71988.26	1	7,454,995
1950	16,930	5,659,778	76471.86	2	7,891,957
1960	17,834	6,452,649	75176.16	1	7,781,984
1970	18,312	7,145,626	75669.77	4	7,895,563
1980	18,766	7,426,214	69449.73	2	7,071,639
1990	18,971	7,990,691	72144.92	0	7,322,564
2000	19,229	8,931,416	78138.9	0	8,008,278

Note: Alaska, Hawaii and Puerto Rico are excluded

Table 2. Descriptive statistics of MSA's

Year	MSAs	Mean Size	Standard Deviation	Minimum	Maximum
1900	104	280,916	586,361	52,577	5,048,750
1910	130	307,262	719,325	50,731	7,049,047
1920	139	362,905	847,072	51,284	8,490,694
1930	145	445,147	1,063,769	50,872	10,900,000
1940	148	473,984	1,125,419	51,782	11,700,000
1950	150	570,481	1,272,541	56,141	12,900,000
1960	265	478,076	1,093,796	51,616	13,000,000
1970	270	560,024	1,314,282	53,766	16,100,000
1980	281	616,211	1,450,101	57,118	18,900,000
1990	351	586,738	1,451,268	51,359	19,500,000
2000	353	656,758	1,504,512	52,457	18,300,000

Note: Alaska, Hawaii and Puerto Rico are excluded

3. Empirical analysis

3.1. Incorporated Places

In the context of the city size distribution and, in particular, in the sequential city growth literature, we want to test, in each decade of our sample, which kind of cities grow the most.

More specifically, as Dobkins and Ioannides (2001) point out, the US system is characterized by the entry of new cities during the 20th century. We are interested in the evolution of those specific cities all over the period of analysis. As we said previously, cities will be represented by data on incorporated places.

According to sequential city growth literature, those "new cities" should growth rapidly during the first existence decades and stabilize (or decrease) during the following ones. In order to contrast this hypothesis, we estimate the following model:

$$g_{i,t} = \sum_{k \geq 1} \beta_k d_{k,i,t} + \delta_t + \gamma_s + \eta_r + \mu_s + \varepsilon_{i,t} \qquad (1)$$

where the endogenous variable g is the growth rate for each city i (or MSA) and time t calculated as $g_t = ln\, p_{t+1} - ln\, p_t$, where p is the population. The coefficients β_k correspond to a dummy variable (d), capturing the age of the cities. In the first period, d is equal to one if the city is “new” and zero if not. A city is new when had no growth rate in t-1 and have it in t, meaning that it appeared in time t. When the value is zero could be both because the city does not exist yet or because the city exists since the first decade of the sample so it will never be a “new” place. Moreover, δ_t is a time-fixed effect, γ_s is a country-fixed effect, η_r is a region-fixed effect and μ_s is a dummy capturing other location-fixed effects.

Such specification imposes very little on the response of dynamics. Table 3 shows the evolution of those nine dummies over the ten periods included in the analysis. We can see the new-born cities in each decade and their evolution until 1990 (the last year is 2000 but we can only have nine dummies in a ten decades period). For each year, d_1 ($d_{i,k,t}$ when $k = 1$) is the number of new cities that appear that particular year, meaning that in 1910 there are 3,291 new cities entering in the sample, in 1920 there are 1,748 new cities, and so on. Column d_2 shows the number of new-born cities that appear the year before, column d_3 the ones that entered two years before, and so on so forth. At first sight, we can observe that the number of new cities is decreasing over the century (it increases a bit in 1960 but there is a decreasing tendency), meaning that as decades pass, less cities appeared indicating a transition a stable situation. Moreover, we can see the evolution from the year they appeared until the end of the period. We observe that some of them disappeared during the century. This is due to the fact that some of them increased their borders and absorbed others. The number on “new” cities at the end of the period, which means in 1990, is 9,414 (we obtain it by adding the numbers in the last row of the table). They represent the 42.52% of the total sample.

Table 3. Evolution of incorporated places over the 20th century

year	**d_1**	**d_2**	**d_3**	**d_4**	**d_5**	**d_6**	**d_7**	**d_8**	**d_9**
1910	3291	0	0	0	0	0	0	0	0
1920	1748	3229	0	0	0	0	0	0	0
1930	1270	1712	3171	0	0	0	0	0	0
1940	505	1248	1685	3132	0	0	0	0	0
1950	647	489	1213	1658	3088	0	0	0	0
1960	1048	628	470	1167	1615	3025	0	0	0
1970	757	1027	620	459	1158	1598	3010	0	0
1980	554	750	1010	612	457	1143	1589	2987	0
1990	313	553	750	1008	612	457	1143	1588	2987

Source: Self elaboration with US Census Bureau data

Taking into account the hypothesis we are testing, we expect β_k to be positive and significant the first decades and, as the decades pass, this coefficient should decrease, losing the statistical significance or even taking negative values. However, we need to account for something more in order not to bias our estimations. We need to add some controls that capture any time or space trend that could influence the results. This is the reason why we include time and state-fixed effects in our estimation.

Furthermore, Black and Henderson (2003) found that cities in the US which have coastal locations grow faster and they add some regional variables in their analysis in order to capture some market potential.[1] So, to control for these characteristics, we include a dummy variable that captures the access to navigable waters (including access to rivers, lakes or the ocean) at the state level, and four dummy variables, one for each of the bigger regions in the: the Northeast, the Midwest, the South and the West.

Apart from those dummies, we include one more control variable which captures changes in industrial composition in the US over the 20th century. As Kim and Margo (2004) explain, on the first half of the twentieth century, the rise of the industrial economy and the manufacturing (or rust) belt made people to move westward. Since 1950, thanks to the diffusion of the air conditioning and milder winters, the population grew in the southern part on the country, leading to the creation of the Sun Belt. We included two dummies at the state level, one for each, rust or sun belts, so as we can control for those regional and industrial patterns on population growth rate.

In some specifications of the model that we estimate in the next section, we include a variable capturing the city size. According to the literature, including this variable, we can test the mean reversion hypothesis. When the coefficient of this variable is negative, it means that we can assume mean reversion (convergence) in the steady state. A non-significant coefficient can be interpreted as independence between growth and initial size, supporting Gibrat's law. As we have said before, we are also interested in testing this hypothesis, in order to align our results to this literature. Black and Henderson (2003) and Henderson and Wang (2007) found that the smallest cities grow faster, supporting the mean reversion hypothesis. Therefore, there is some kind of "size effect" on growth, because the smaller cities grow faster than the larger ones. However, as our main point is to analyze the dynamics before the steady state,

[1] Other authors like Rappaport and Sachs (2001) or Mitchener and McLean (2003) also point that having access to navigable waters play an important role in explaining population distribution.

sometimes, this size effects cause that the temporal effects to be more ineffective because the "new cities" tend to be small cities, and is hard to distinguish both effects. In Section 5 we use a non-parametric approach to examine the relationship between the temporal dimension of growth (the age of the city) and initial size. Moreover, the city size may be, in some cases, a source of possible endogeneity. However, in our analysis the results do not change much from a specification including the city size to another without the variable. These are the reason why we include it but not in all the specifications.

3.2. Metropolitan Areas

We replicate the analysis also for MSAs. We want to test if the growth pattern we suppose for incorporated places, still works when aggregating the geographical units. As we have mentioned in the second section of this paper, a MSA usually comprise a group of counties with a central city with a minimum of 50,000 inhabitants and some other smaller places in the surrounding of this central city. According to the sequential growth literature, central city (assumed to be "older" than many others from the surrounding) will have different growth patterns over the time period than other cities within the same MSA. More specifically, central city will be more mature than the rest and its growth rate is expected to be lower. On the other hand, there will be other smaller and younger cities that will grow stronger during the same period. Therefore, it might be the case that MSAs do not follow the same growth pattern as incorporated places.

Table 4 shows the evolution of the nine key dummy variables over the 20th century. There are two main differences between both tables: no MSA disappears from the sample (once a MSA reaches the minimum population threshold never falls down) and the decreasing tendency on appearance of new MSAs is not as clear as in Table 3 for incorporated places. We can observe that the number of "new MSA" at the end of the period is 180, which represents the 49.85 % of the sample.

Table 4. Evolution of MSAs over the 20th century

year	d_1	d_2	d_3	d_4	d_5	d_6	d_7	d_8	d_9
1910	23	0	0	0	0	0	0	0	0
1920	7	23	0	0	0	0	0	0	0
1930	6	7	23	0	0	0	0	0	0
1940	3	6	7	23	0	0	0	0	0
1950	2	3	6	7	23	0	0	0	0
1960	85	2	3	6	7	23	0	0	0
1970	6	85	2	3	6	7	23	0	0
1980	48	6	85	2	3	6	7	23	0
1990	0	48	6	85	2	3	6	7	23

Source: Self elaboration with US Census Bureau data

4. Results

Table 5 presents the results of the equation (1) for incorporated places

Table 6 presents the results for MSAs

Table5. Estimation of the dynamic effects of incorporated places

	(1)	(2)	(3)	(4)	(5)	(6)
d1	0.142***	0.169***	0.154***	-0.085	0.118***	0.128***
	(0.005)	(0.005)	(0.005)	(0.078)	(0.005)	(0.005)
d2	0.048***	0.069***	0.070***	-0.135*	0.025***	0.045***
	(0.004)	(0.004)	(0.004)	(0.078)	(0.004)	(0.004)
d3	0.017***	0.035***	0.036***	-0.150*	-0.004	0.013***
	(0.003)	(0.003)	(0.003)	(0.078)	(0.003)	(0.003)
d4	0.002	0.018***	0.004	-0.165**	-0.016***	-0.015***
	(0.003)	(0.003)	(0.003)	(0.078)	(0.003)	(0.003)
d5	-0.016***	-0.0002	-0.023***	-0.179**	-0.032***	-0.038***
	(0.003)	(0.003)	(0.004)	(0.078)	(0.003)	(0.003)
d6	-0.025***	-0.009***	-0.016***	-0.167**	-0.039***	-0.027***
	(0.003)	(0.003)	(0.003)	(0.078)	(0.003)	(0.003)
d7	-0.028***	-0.013***	-0.015***	-0.162**	-0.041***	-0.023***
	(0.003)	(0.003)	(0.003)	(0.078)	(0.003)	(0.003)
d8	-0.096***	-0.082***	-0.033***	-0.177**	-0.106***	-0.036***
	(0.003)	(0.003)	(0.004)	(0.078)	(0.003)	(0.003)
d9	-0.019***	-0.005	-0.020***	-0.169**	-0.026***	-0.019***
	(0.004)	(0.004)	(0.005)	(0.078)	(0.004)	(0.005)
City size		0.025***		-0.219***		
		(0.0005)		(0.003)		
City fixed effects	No	No	No	Yes	No	No

Time effects	No	No	Yes	Yes	No	Yes
State effects	No	No	No	No	Yes	Yes
Region effects	No	No	No	No	No	Yes
Navigable waters	No	No	No	No	No	Yes
Sun & Rust Belts	No	No	No	No	No	Yes
Observations	160,342	160,342	160,342	160,342	160,342	160,342
R-squared	0.019	0.034	0.042	0.194	0.064	0.087
F	192.6	396.5	298.6	501.7	.	175.9

Note: Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table5. Estimation of the dynamic effects of MSAs

	(1)	(2)	(3)	(4)	(5)	(6)
d1	0.055***	0.058***	0.101***	0.009	-0.024*	0.019
	(0.015)	(0.016)	(0.015)	(0.034)	(0.013)	(0.014)
d2	0.069***	0.072***	0.098***	0.018	-0.009	0.016
	(0.016)	(0.016)	(0.016)	(0.031)	(0.014)	(0.014)
d3	0.005	0.006	0.094***	0.006	-0.085***	-0.0009
	(0.014)	(0.015)	(0.014)	(0.028)	(0.012)	(0.011)
d4	0.022*	0.024*	0.073***	-0.004	-0.070***	-0.024*
	(0.013)	(0.014)	(0.013)	(0.025)	(0.013)	(0.012)
d5	0.157***	0.158***	0.121***	0.041	0.057*	0.027
	(0.029)	(0.029)	(0.027)	(0.033)	(0.030)	(0.026)
d6	0.018	0.018	0.071***	0.001	-0.080***	-0.019
	(0.027)	(0.027)	(0.027)	(0.025)	(0.027)	(0.026)
d7	0.020	0.020	0.067**	0.010	-0.071***	-0.018
	(0.028)	(0.028)	(0.027)	(0.024)	(0.027)	(0.025)
d8	-0.040*	-0.040*	0.072***	0.017	-0.133***	-0.018
	(0.024)	(0.024)	(0.024)	(0.014)	(0.018)	(0.017)
d9	-0.041**	-0.041**	0.048**		-0.131***	-0.038**
	(0.019)	(0.018)	(0.020)		(0.018)	(0.019)
City size		0.001		-0.125***		
		(0.003)		(0.019)		
City fixed effects	No	No	No	Yes	No	No
Time effects	No	No	Yes	Yes	No	Yes
State effects	No	No	No	No	Yes	Yes
Region effects	No	No	No	No	No	Yes
Navigable waters	No	No	No	No	No	Yes
Sun & Rust Belts	No	No	No	No	No	Yes
Observations	1,734	1,734	1,734	1,734	1,734	1,734
R-squared	0.041	0.042	0.205	0.345	0.270	0.429
F	7.692	6.962	25.71	42.44	12.85	16.51

Note: Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

5. Non parametrical analysis

In order to complement our results and to illustrate them in a more visual way, we run non-linear kernel regressions, which consist on a first-derivative approximation of growth versus initial population level (in logarithmic terms). Desmet and Rappaport (2011) apply the same analysis also for the United States but with different geographical units. We run kernel regressions for the incorporated places, while they do so for counties and MSAs. The estimations are calculated with a 0.5 bandwidth.

This type of analysis allows us to visually compute the temporal evolution of incorporated places by city size. Figure 1 shows the results of kernel regressions for every decade. At first glance, we can see that smaller cities have higher growth and the larger the city, the less the growth rate. We can also observe that at some point, the growth rate becomes more stable. Moreover, apart from the dynamics, we can also conclude that there is presence of mean reversion because the relation of growth and size is negative in most cases. If this was not the case, in Figure 1 we would only have horizontal lines coinciding with the axis.

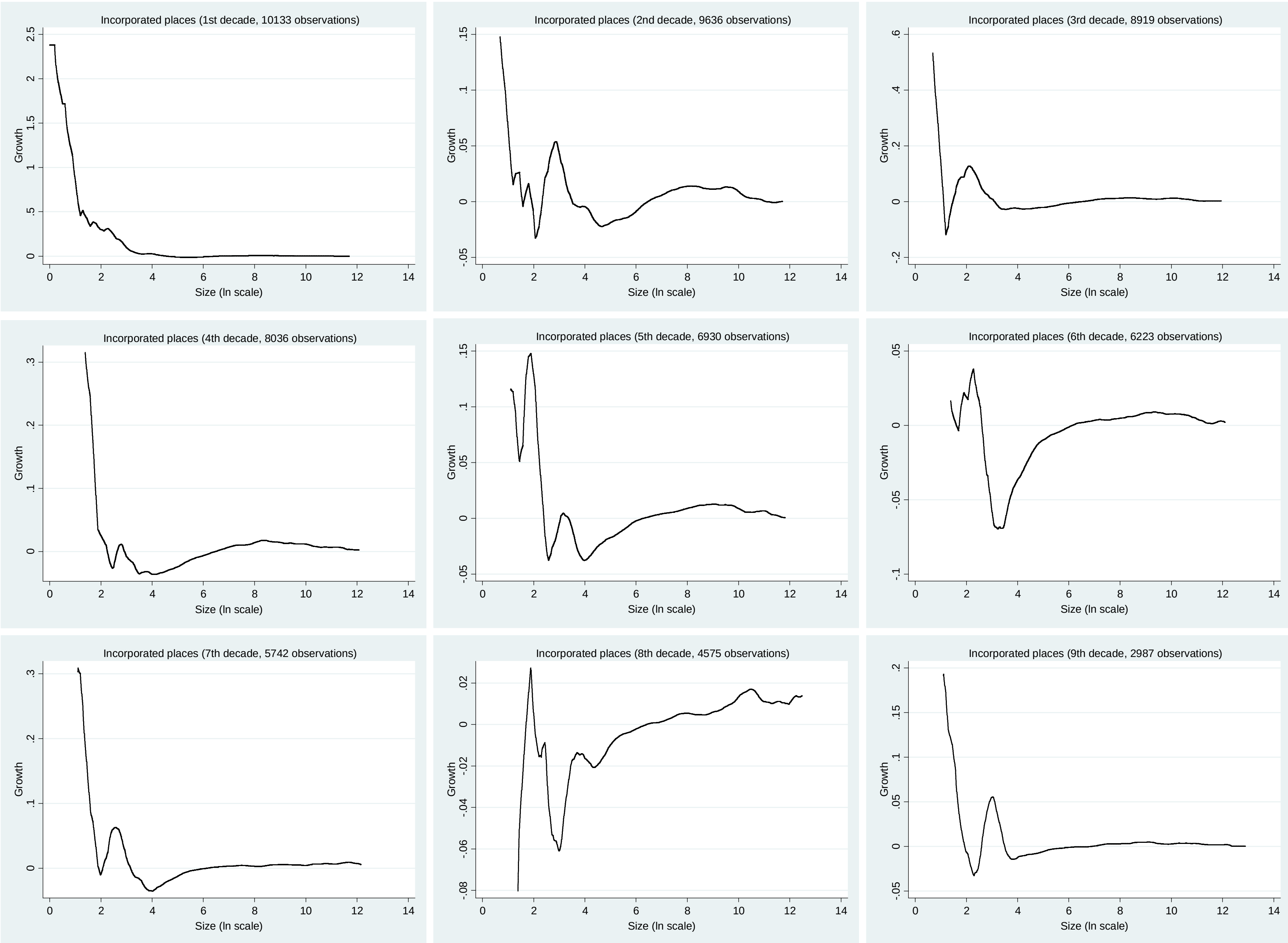

Figure 1. Growth and size by decades

6. Conclusions

[TO BE DONE]

REFERENCES

Black, D. and Henderson, V., 2003. "Urban Evolution in the USA", *Journal of Economic Geography*, 3, 343- 372

Bogue, D. 1953. *Population Growth in Standard Metropolitan Areas: 1900-1950*. Washington, DC: Housing and Home Finance Agency.

Cuberes, D., 2009. "A model of sequential city growth" *The BE Journal of Macroeconomics* 9 (1) (Contributions), Article 18.

Cuberes, D., 2011. "Sequential City Growth: Empirical evidence" *Journal of Urban Economics*, 69, 229-239.

Desmet, K. and Rappaport, J., 2011. The settlement of the United States, 1800 to 2000: The Long Transition Towards Gibrat's Law. Paper presented at: 6th Meeting of the Urban Economics Association at the 58th Annual North American Meetings of the Regional Science Association International, Miami (USA).

Dobkins, L. and Ioannides, Y.M., 2000. "Dynamic Evolution of the US City size Distribution" in .JM. Huriot, and J.F. Thisse (eds), *The Economics if Cities*. Cambridge: Cambridge University Press, pp. 217-260.

Dobkins, L and Ioannides, Y.M., 2001. "Spatial Interactions among US cities: 1900-1990", *Regional Science and Urban Economics*, 31, 701-731.

Eeckhout, J. 2004. "Gibrat's law for (All) Cities", *American Economic Review*, 94 (5), 1429-1451.

Gabaix, X. 1999. "Zipf's Law for Cities: An Explanation", *Quarterly Journal of Economics*, 114(3), 739-767.

Gabaix, X and Ioannides, Y.M., 2004. "The Evolution of City Size Distributions", in J.V. Henderson and J.F. Thisse (eds), *Handbook of Urban and Regional Economics*, vol. 4. Amsterdam: Elsevier Science, North-Holland, pp.2341-2378.

Glaeser, E.L. and Shapiro, J., 2003. "Urban Growth in the 1990s: Is City Living Back?" *Journal of Regional Science*, 43 (1), 139-165.

González-Val, R., 2010. "The Evolution of the US City Size Distribution from a long term perspective (1900-2000*). Journal of Regional Science*, 50 (5), 952-972.

Henderson, J.V. and Venables, A.J., 2009. "Dynamics of city formation". *Review of Economic Dynamics* (2), 233-254.

Henderson, J.V. and Wang, H.G., 2007. "Urbanization and city growth: the role of institutions. *Regional Science and Urban Economics*, 37 (3), 283-313

Ioannides, Y.M. and Overman, H.G., 2003. "Zipf's Law for Cities: An Empirical Examination", *Regional Science and Urban Economics*, 33, 127-137.

Kim, S and Margo, R.A., 2004. "Historical Perspectives on US Economic Geography", in J.V. Henderson and J.F. Thisse (eds), *Handbook of Urban and Regional Economics*, Vol 4. Amsterdam: Elsevier Science, North-Holland, Chapter 66, pp.2982-3019.

Krugman, P. 1996. *The Self-Organizing Economy*. Cambridge: Blackwell

Mitchener, K. and McLean, J., 2003. “The productivity of US states since 1880”. *Journal of Economic Growth*, 8 (1), 73-114.

Rappaport, J. and Sachs, J. 2001. “The US as a coastal nation”. *Journal of Economic Growth*, 8 (1), 5-46.

Reed, W., 2002. On the rank-size distribution for human settlements. *Journal of Regional Science*, 42, 1-17