XXXIII CONFERENZA ITALIANA DI SCIENZE REGIONALI

WHY MEGA CITIES? FACTS AND TRENDS OF GLOBAL URBANIZATION

Johann SPITZER* and Giuseppe FOLLONI*

ABSTRACT

The paper analyzes urbanization processes and growth of cities in the period 1960-2000.
Starting from the idea that there are urbanization processes of different quality (performing and non performing) we try to find the differences in the underlying factors of cities growth, in particular among large agglomerations, through a cross-country analysis that involves 114 countries (and almost 2,000 cases of cities of different dimensions). The reference models are in particular these of Ades and Glaser (1995) and Davis and Henderson (2003).
Our results indicate that growth in very large agglomeration tends to be "non-performing" and backwardness' indicators linked to institutional weaknesses, seems to be the leading growth factors.
We are aware of the fact that the relations we analyze have huge problems of endogeneity and reverse causality that will need further research (and better data) to be solved.

* Department of Economics, University of Trento, via Inama 5 , I -38122 TRENTO
Corresponding author: Johann Spitzer, e-mail: johann.spitzer@gmail.com

1. Urbanization and economic growth

In 2008, for the first time in history, the percentage of world's urban population exceeded the rural population[1]. According to United Nations, the mentioned trend will continue to increase in all regions without exception. By the year 2050 urban population should reach 70% of world's population.

Table 1. Percentage of urban population by region[2]

Area	1950	1980	2010*
Offshoots			
Northern America	63,90	73,93	82,13
Australia/New Zealand	76,16	85,35	**88,62**
Latin American			
South America	42,79	67,40	**83,98**
Central America	39,22	60,22	72,00
Europe			
Western Europe	63,83	72,71	**79,50**
Northern Europe	69,69	76,41	79,08
Southern Europe	45,13	62,15	67,77
Eastern Europe	39,72	63,81	68,94
Asia			
Eastern Asia	15,51	25,55	50,17
South-Central Asia	16,44	24,35	32,08
South-Eastern Asia	15,48	25,53	41,84
Western Asia	28,60	51,89	**66,53**
Africa			
Northern Africa	24,78	40,15	51,15
Eastern Africa	5,30	14,73	23,59
Western Africa	9,79	27,18	44,85
Middle Africa	14,00	28,96	43,12
Southern Africa	37,65	44,74	**58,69**

Source: UN World Urban Prospects (2009). * UN projections.

As a general pattern the levels of urbanization are higher among developed regions.The most urbanized regions of the world in 1950, were Europe and North America; however, if we look at the year 2000 we find some important changes. Table 1 presents a detailed comparison between the levels of urbanism in different regions in a temporal frame of 60 years.

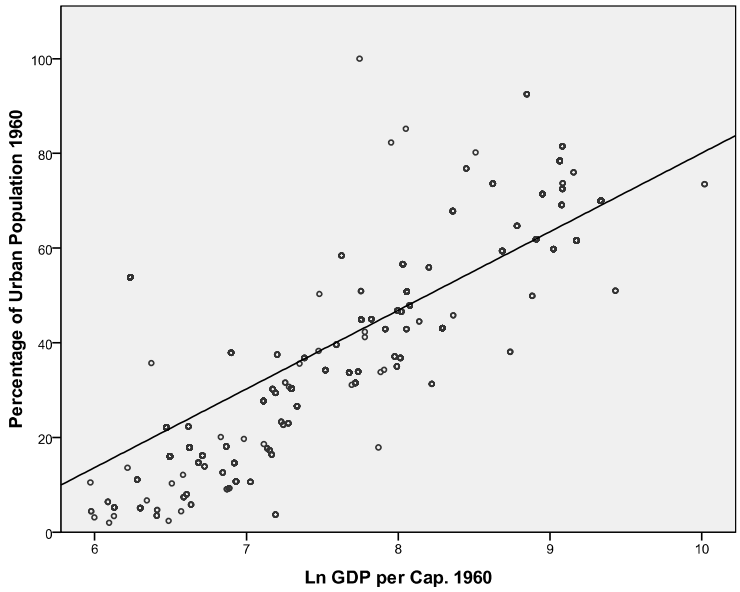
For example, in 2010 Latin America has reached a percentage of urban population that is similar to that of more advanced economic regions. Some Asia regions have still a lower level of urbanization but urbanization growth is impressive (table 1).

[1] UN World Urbanization Prospects (2010) classifies the world population in two main groups: Rural and Urban Population. Urban population regards *de facto* population living in areas classified as urban according to the criteria of each country, meanwhile rural population is *de facto* population living in areas classified as rural, which it's the difference between the total population of a country and its urban population. The Population Reference Bureau refers that although the different country classification of rural and urban, a typical definition of urban refers to settlements with 2,000 or more people.

[2] See Box A1 in appendix for the subdivision of countries in the different regions.

To better understand the relation between the level of economic growth and the urbanization level we observe (figure 1) that at the country level there is a *positive relation between economic development and the share of urban population*[3].

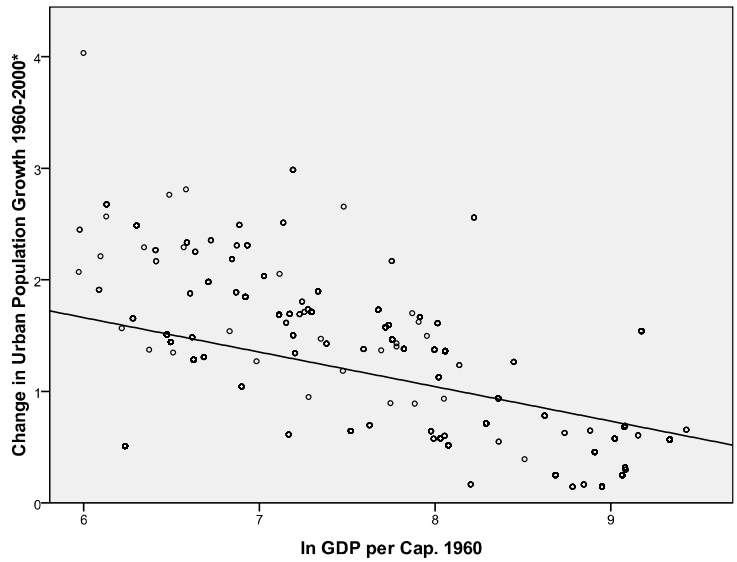
Figure 1. ln GDP per Capita (1960) and share of Urban Population (1960)



Source: Urban dataset; our elaboration.

A second observation is that data show a certain *"convergence" dynamic.* Countries with a low level of GDP per capita (and hence a lower level of urbanization) have seen a much higher growth in urban population in the forty years analyzed (see figure 2).

Figure 2. ln GDP per Capita (1960) Rate of Urban Population Growth (1960-2000)

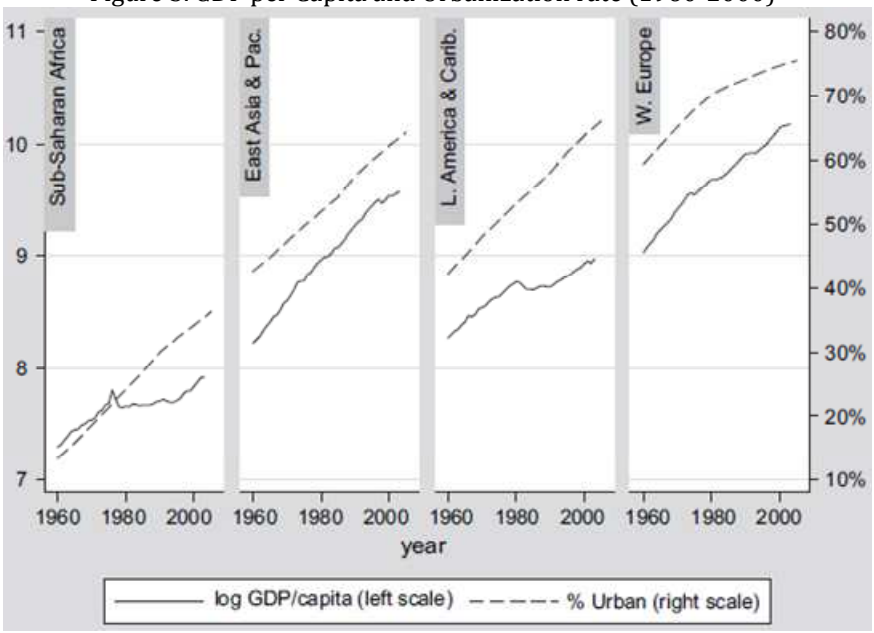


Source: Urban dataset; our elaboration.
*The rate of growth: Ln (Urb.pop.00) - Ln (Urb.pop.60)

[3] Data are from our dataset: Box A2 in appendix.

A third observation go deeper. If we look to figure 3 (from van Der Ploeg and Poelhekke 2008), there are regions (East Asia and Pacific – emerging economies-, and Western Europe) that follow exactly the convergence model. Instead, both Latin America and Sub-Saharan Africa show no relation between economic growth and urbanization, in the second half of the period analyzed. For these regions, high urbanization rates do not necessarily imply, neither a deep transformation of the economic structure nor the achievement of higher income levels.

Figure 3. GDP per Capita and Urbanization rate (1960-2000)



Source: van der Ploeg and Poelhekke, 2008

In view of these facts, we can identify two types of urbanization processes: performing urbanism and non-performing urbanism.

Performing urbanism indicates a particular arrangement of the urban structure that emulates in some extent the idea of Christaller (1933), where institutional aspects, economies of scales, and transport costs, shape an optimal hierarchical urban structure, low levels of primacy, a low Zipf parameter and, in general, interrelated network between cities, which accompanies the structural transformation of the economy,.

However, the urbanization process can be delinked from economic efficiency. Weak democracy, concentration of power, the necessity to interact with the center of power and insecurity in the hinterlands, deeply affect the locational behavior of people and activities and hence the urban structure. In this context, a giant agglomeration could probably emerge, characterized by strong negative pecuniary (increasing cost of

housing and commuting), and negative technological externalities (pollution), while positive technological externalities (networking, spillovers) can become weaker. We call this *non-performing urbanism,* characterized by high primacy, a high Zipf parameter, a self-contained cities with weak interrelations with other parts of the urban network.

2. The Definition of City and the consequent typology

A detailed analysis of the urban structure and its transformation require the identification of the unit of analysis: the city. However, its definition carry out several problems, because there are different within definition and measures of what a city is. Definitions vary between and countries (United Nation, 1974). The online Glossary of Statistical Terms of the OECD[4] defines city groups or administrative regions but now what a city is. Also the three classical criteria used to define a city give raise to very big differences.

The Administrative criterion considers the organization of the territory according to administrative and legal boundaries. Each country presents its own administrative unities (or city proper)[5], and classifies urban settlements in hierarchical structures according to criteria that are politically shaped. So, it is usual to observe different definitions of urban units in each country, making very difficult to compare urban units. Moreover, this definition does not capture the evolution of urban settlements and its functions.

The Physical criterion defines the city by its physical form, using different indicators (ie. densities of people, of housing or economic activities). The most typical physical definition of a city is the term "agglomeration". The United Nations define an urban agglomeration as "*de facto* population contained within the contours of a contiguous territory inhabited at urban density levels without regard to administrative boundaries. It usually incorporates the population in a city or town plus that in the sub-urban areas lying outside of but being adjacent to the city boundaries" (United Nations 1994). So, an agglomeration is a continuous urban settlement which can be formed by several municipalities.

[4] http://stats.oecd.org/glossary/

[5] According the UN definition (see Glossary of UN World Urbanization Prospects 2007 available at: http://esa.un.org/unup/index.asp?panel=6) the city proper is a "a locality defined according to legal/political boundaries and an administratively recognized urban status that is usually characterized by some form of local government."

Data availability is certainly an advantage of the physical criteria; information of several countries considering large periods are available.

However, this perspective is also limited. The definition of what an "agglomeration" is, varies between countries. In particular, in advanced economies well established transport infrastructures, diffused educational and health services, land market regulations and territorial policies create urban spaces that go beyond the physical limits of an "agglomeration", creating conurbations, megalopolis, industrial and green belts, continuous urban corridors that make difficult to observe the boundaries of cities (see for instance the contributions of Cheshire and Sheppard, 2004; Bertaud and Brueckner, 2005).

This is in the direction of what Huang *et. al.* (2007) find analyzing agglomerations in Asia, US, Europe and Latin America, through spatial metrics and remote sensing. They observe that cities in developing regions are more compact and dense than those in developed regions.

Functional criterion. In recent decades cities have known several changes in the territorial distribution of their functions. To avoid congestion and negative externalities there have been both residential and productive decentralization processes (we think in particular to filtering down industrial processes: Erickson, 1976). On the other hand, the growth of knowledge economy, the rising importance of innovation and creativity made of the city and of cities' networks the most adequate place to provide knowledge-based services. These many folded changes go in the direction of a functional definition of a city. Already during the 40s, the US concept of Metropolitan Statistical Area (MSA) defined the city not only through population densities, but also though the patterns of spatial characteristics of employment, commuting, in a synthesis, the "functional" area of the city's life.

In the European contexts, the Functional Urban Regions (FUR) represent the most approximate definition of Metropolitan Areas (Cheshire and Hay, 1989), where boundaries of the city are indicated through economic relationships and not historical or political division.

Several countries have adopted the functional definition of the city, although methods vary across countries (Antikainen, 2005); the functional definition is consistent, and remains the most valid approach. Certainly, the difficulty in adopting it is the lack of information and data in developing areas.

Our (constrained) choice

The definition of city affects the empirical analysis and the conclusion that can be drawn. Considering the three definitions of cities already reviewed, we easily drop the administrative definition, remaining with the physical and functional ones. Nevertheless, the selection of a functional criteria due to data scarcity, could imply to abandon the possibility of observing urban growth patterns in developing countries, where the most important urban changes in the last decades have happened.

Our research looks for patterns of growth in cities, so, we will consider the physical perspective (the UN definition of "urban agglomeration" urban agglomeration data (physical perspective), being aware of its limits, especially when comparing different economic and institutional context.

Our dataset contains data on 1924 urban agglomerations for the years 1960-2000, located in 134 countries, involving more than 55 % of the world's urban population. For more details about the coverage of our dataset see Box A2.

Finally, in our analysis we consider different typologies of cities, according to their population size. We will use the definition of the UN World Urbanization Prospects which splits cities in five categories according to size: Mega cities (more than 10 million people); Big cities (between 5 and 10 millions); Midsize cities (1,5-5 millions); Small cities 0,5 to 1,5 millions); Towns (less than 0,5 millions).

3. Categories of cities and their growth

In Table 1 we classify cities by size (number, average population and share in the urban dataset). The main evidences are the growth both in the number and in the urban population share of mega and midsize cities over the total; and the corresponding reduction in the number of small cities and town and in the population share of this last typology.

Table 1. Cities sizes and urban population distribution 1960 and 2000

City size (millions)		Number of cities 1960	Average pop. per city 1960	Share* 1960	Number of cities 2000	Average pop. per city 2000	Share* 2000
Mega	> 10	2	12.600.000	4%	19	13.821.053	16,6%
Big	5 - 10	12	6.706.417	12,6%	23	7.064.609	10,3%
Midsize	1,5 - 5	56	2.431.383	21,3%	188	2.503.472	29,7%
Small	0,5 - 1,5	205	815.576	26,2%	440	910.897	25,3%
Town	< 0,5	1649	138.813	35,9%	1254	230.078	18,2%
		1924		100%	1924		100%

Source: Urban dataset, own elaboration.
* Share of the urban population in the Urban dataset (total 1924 cities)

The transition matrix in Table 2 shows the number of cities that changed their typology (increasing their size) in the period 1960-2000. As it can be seen, more than half of the 1960 big cities have become megacities in 2000; almost 50% of small cities have changed of typology and some of these have become big or mega, with very traumatic jumps. About 400 towns (24% of the total) have become small or midsize cities.

From the point of view of the category of "destination", the number of megacities has grown of a factor 9; big cities have doubled in number; the number of midsize cities has changed to a factor 3. Mega cities and midsize cities are also the typologies with the higher growth rate in the relative population (166% and 163% respectively). In average we observe that growth patterns are not necessarily related to size, confirming in some extent Gibrat's law (1931)[6].

Asia and Africa are the two regions with the most impressive changes. In Asia all the 1960 big cities have become mega, 75% of midsize cities have become big or mega cities; 60% of small cities have jumped to a higher typology with some very traumatic jumps (like the one of Lagos in Nigeria and Dhaka in Bangladesh). In 2000, more that half of the big and mega cities were in Asian countries.

Africa has also known very traumatic jumps. In 1960 neither big nor mega cities did exist, while now in Africa three cities are in these two categories, with a jump from a town or small dimension to a big or mega one. As we will see, most of these traumatic jumps are linked not only to an intensive urban migration, but also to the consequences of civil conflicts and warfare (see for instance Glaeser and Shapiro, 2001), as the case of Lagos and Kinshasa..

[6] Gibrat's law has been broadly studied; most of the authors such as Gabaix (1999b), Ionnides and Overman (2000; 2003) agree with it; however Rosen and Resnick (1980) and Black and Henderson (2003) do not; therefore it remains as a controversial issue.

Table 2. Changes in cities sizes and cities population between 1960-2000

Cities by size: Transition matrix 1960-2000 (number)

	1	2	3	4	5	Total 60'
1	2	-	-	-	-	2
2	7	5	-	-	-	12
3	8	13	35	-	-	56
4	2	4	90	105	4	205
5	-	1	63	335	1250	1649
Total 00'	19	23	188	440	1254	1924

Transition Matrix: Latin America and Caribbean

	1	2	3	4	5
1	-	-	-	-	-
2	2	-	-	-	-
3	2	2	-	-	-
4	-	1	11	4	-
5	-	-	13	49	235
% of changes		25%			

Transition Matrix: Asia

	1	2	3	4	5
1	1	-	-	-	-
2	4	-	-	-	-
3	5	10	5	-	-
4	1	3	49	29	-
5	-	-	33	157	473
% of changes		34%			

Transition Matrix: Africa

	1	2	3	4	5
1	-	-	-	-	-
2	-	-	-	-	-
3	1	-	1	-	-
4	1	-	6	1	-
5	-	1	15	41	105
% of changes		38%			

Transition Matrix: Offshoots

	1	2	3	4	5
1	1	-	-	-	-
2	1	1	-	-	-
3	-	-	13	-	-
4	-	-	16	25	-
5	-	-	1	53	84
% of changes		36%			

Transition Matrix: Western Europe

	1	2	3	4	5
1	-	-	-	-	-
2	-	3	-	-	-
3	-	-	14	-	-
4	-	-	3	25	4
5	-	-	1	12	181
% of changes		8%			

Transition Matrix: Eastern Europe

	1	2	3	4	5
1	-	-	-	-	-
2	-	1	-	-	-
3	-	1	2	-	-
4	-	-	5	21	-
5	-	-	-	23	172
% of changes		13%			

Population in cities according size in 1960 (mill.)

	1	2	3	4	5	Total 60'
1	25	-	-	-	-	25
2	46	35	-	-	-	80
3	26	29	81	-	-	136
4	1	5	80	78	3	167
5		0,5	18	79	131	229
Total 60'	99	69	179	157	134	638

Population in cities according size in 2000 (mill.)

	1	2	3	4	5	Total 00'
1	43	-	-	-	-	43
2	91	40	-	-	-	131
3	103	93	112	-	-	307
4	26	25	228	116	2	396
5	-	5	131	285	287	707
Total 00'	263	162	471	401	289	1585

Rate of growth in cities according size, 1960-2000

	1	2	3	4	5	
1	71%	-	-	-	-	71%
2	101%	15%	-	-	-	63%
3	287%	220%	39%	-	-	125%
4	1660%	396%	185%	49%	-34%	137%
5	-	1023%	612%	259%	119%	209%
	166%	135%	163%	155%	116%	148%

In Latin America, although with "jumps" of lower level, we had a similar process of hyper-urbanization in many countries, as Peru, Colombia, Brazil, Mexico. Here too, factors as insecurity in the hinterland, terrorism and dictatorships have guided this kind of urbanization.

In the offshoots countries the number of changes is high (38% of the number of observations), but these changes do not consist of traumatic jumps; they are the evolution of town to the level of small cities and of small cities to the midsize level. In these countries international migrations had a specific role in their growth.

Lastly, the regions with fewer transformations are Western and Eastern Europe, where changes of size are very few and traumatic jumps are absent.

Growth of urban agglomeration is then different across regions and according the different sizes of cities. Taking as reference the works of Glaeser and Henderson, we try now to see how the different dimensions (economic and geo-economic, demographic, institutional and historical[7]) affect cities growth. We will analyze also which differences in growth factors exist between different sizes of cities and different regions; and the consequences cities growth on the quality of urban structure of a country (performing or non performing).

4. Growth in Main Cities: Ades and Glaeser Revisited

The study of Ades and Glaeser (1995) considers a period of fifteen years (1970-1985) and analyzes the dimension of main cities in a sample of 50 to 85 countries (according to the different regressions). Consequently, it is reasonable to deepen the analysis on main cities to analyze if, considering a longer period of time and a larger group of countries than the study of Ades and Glaeser (1995) and Gaviria and Stein (2000), changes the drivers that govern main cities dimension and growth. Ades and Glaeser's analysis does not consider the size or category of the city, but only the fact of being a main city.

It is important to acknowledge some weaknesses. Models *à la* Glaeser and *à la* Henderson usually work on urban agglomerations when analyzing different regions and have, as a con sequence, different definitions of what an agglomeration is. Secondly, these models (in particular Ades and Glaeser's) explain urban agglomerations (main cities) through national variables (i.e. economic structure,

[7] For a detailed list of the variables used, see Box A3 in appendix.

GDP per capita, trade openness); hence an endogeneity problem can arise. Another potential problem regards collinearities between explanatory variables (economic and institutional, for instance). A fourth problem is the possibility of reverse causality in the relation between economic growth and urban growth. Cross-country estimation strategy surely presents limits to explain causality, and surely there will be room for more econometric work, but we think, following the literature (eg. Gaviria and Stein, 2000), that for testing the emergence of determinant factors the approach of Ades and Glaeser is valid.

Our first group of regressions (see Table 3[8]) presents a "basic" model for explaining main cities dimension[9]. We describe now the main results, as they are showed in Table 3.

Regression (1), which is the most similar to the regression proposed by Ades and Glaeser, shows that several factors -already identified by the mentioned authors- remain valid, in particular the influence of non urban population, trade level (openness) and institutional variables. However, some differences also emerge, in particular the importance of economic development.

The GDP per capita variable presents a positive and significant effect on the dimension of main cities; this is in line with the negative and significant effect of the share of Agriculture in GDP, a variable that in many countries is linked to economic backwardness; hence a rural-based economy reduces main cities dimension.

Trade openness is negatively linked with the dimension of main cities. In this sense, Krugman and Livas (1992) hypothesis is confirmed. Being open to international trade reduces the importance of agglomeration in the main city.

A third element regards (as in Ades and Glaeser) institutional factors*:* good political regimes (democracies) are clearly linked to lower dimension of main cities. Countries with weak institutions tend to have higher main cities sizes. Although our institutional results are coherent with Ades and Glaeser, it is important to mention that our institutional variables differ; we do not have a dictatorship dummy or a "coups and revolutions" variable; we consider a variable

[8] For a detailed analysis of all regressions, see Appendix 3.1.

[9] The dimension of the main city is calculated by the log average of their agglomeration population in 1960, 1970, 1980, 1990 and 2000.

measuring the quality of democracy (composite political regime) and the way through which political executives are recruited (executive recruitment variable).

Another aspect to highlight is the significance of the regional variables. Latin America and Asia-Middle East regions seem to present specific regional characteristics that affects positively their main cities dimension.

In addition, we observe that legal systems matter; a common law system is negatively related with main city dimension. To deepen the analysis, we have considered other institutional dummies, taking into account the past colonial origin of the country. The dummy on Spanish colonies is positive and significant,. Spaniards' colonial institutions exert a high effect on main city dimension.

Other variables such as transport infrastructure, share of informal economy in GDP, Foreign Market Potential and geographic characteristics (except the presence of deserts), do not show any particular effect on main city dimension, once controlled for the previous variables.

In synthesis we can summarize the following effects:

- The dimension of main cities is related to the size of non urban population and of urban population outside of the main city.
- The level of GDP per capita plays a crucial role in explaining the dimension of the main city, while this variable was not significant in Ades and Glaeser analysis.
- The role of institutions (concentration of power) increases and trade openness reduces the agglomerations forces towards the main city.

Table 3. Ades and Glaeser revisited

Dependent Variable: log average **Pop. Main Cities** 1960-2000	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Capital city dummy	ns	ns	ns	ns						
log average Non Urban Population	** (+)	** (+)	** (+)	***(+)	** (+)	** (+)	***(+)	***(+)	***(+)	**(+)
log average Urban Pop. Outside Main City	*** (+)	*** (+)	* (+)	***(+)	***(+)	***(+)	***(+)	***(+)	***(+)	***(+)
log of Land Area	ns	ns	ns	ns						
log average GDP per Capita	** (+)	*** (+)	** (+)	** (+)	***(+)	***(+)	***(+)	***(+)	*(+)	ns
average Share of Agriculture in GDP	** (-)	ns	ns	** (-)	* (-)	* (-)	* (-)	* (-)	** (-)	* (-)
average Share of Trade in GDP	** (-)	*** (-)	ns	** (-)	** (-)	** (-)	** (-)	** (-)	** (-)	ns
average Political Regime	*** (-)	** (-)	** (-)	*** (-)	** (-)	** (-)	*** (-)	*** (-)	*** (-)	** (-)
average Political Executive Recruitment	ns	ns	ns	ns						
average Share Informal Economy in GDP		ns		ns						
log average Foreing Market Potentional		ns								
average Density of Paved Roads			ns							
averate Density of Railways			ns							
Africa dummy	ns	ns	ns		* (+)	ns	* (+)	** (+)		
Latin America and Caribbean dummy	*** (+)	* (+)	** (+)		*** (+)	*** (+)	*** (+)	*** (+)		
Asia and Middle East dummy		** (+)	ns		** (+)	** (+)	** (+)	*** (+)		
Western Europe & Offshoots dummy						ns				
Nearcoast							ns			
Ruggedness								ns		
Desert								** (-)		
Spain colony dummy				** (+)					***(+)	
Great Britain colony dummy				ns					ns	
French colony dummy				ns					ns	
Common law dummy										** (-)
Civil law dummy										ns
Socialist law dummy										* (-)
Number of observations	117	112	87	112	117	117	117	117	117	117
Ajusted R square	0,743	0,752	0,695	0,748	0,757	0,756	0,758	0,763	0,756	0,763

*** significant at 99%; ** significant at 95%; * significant at 90%; ns: non significant

Source: Urban dataset, our elaboration.

Note: Most averages of variables are of their 1960, 1970, 1980, 1990, 2000 values.

5. Mega and Big Cities: Performing or Non-performing Urbanism?

A central issue in our work, is the study of largest agglomerations, which constitute a particular type of main cities. Megacities are attracting the attention of scholars and policymakers, although few studies have been carried out. One limit, certainly, is the number of observations, reason why we test together Big and Mega cities.

A regression of population level in Mega and Big main cities (MB) with Glaeser's specification gives no results. Neither demographic and economic variables (urbanization level, GDP per capita) nor institutional ones are significant. If we use as dependent variable the change in population between 1960 and 2000 (see table 4), we obtain the following results. Firstly, the only positive and significant relation with MBs is the level of informality in the country. Growth in cities of big dimension is connected with urban informal immigration caused by both the search of labor opportunities (in the direction of the Harris-Todaro Model) and a push factor caused by rural insecurity (as in several African and Latin American countries). Economic growth in the period considered is negatively correlated with MBs growth: it isn't economic progress the force that drives their expansion. Also other economic variables: openness and being inserted in the global market (Trade and Foreign market potential variables) go in the direction of a lower MB growth. As we have already noted, openness and integration in international market are linked to a more equilibrated urban system. Finally, as regards geographical variables, the dimension of the country (Land Area) has a negative effect on growth, perhaps because of higher transport and migration costs. Institutional variables are not significant[10].

In synthesis, the growth of MBs seems not driven by positive economic variable; instead it is driven by dysfunctioning markets (informality).

6. Growth in Midsize Cities: A complex Issue

We consider now the dimensional growth of "non main Midsize cities" (NMM). In our database we have 188 midsize cities (in 2000); 56 were of this size in 1960; of these, only 35 remained midsize in 2000 (with a very low growth), 153 have grown to a midsize level from being previously small cities (90) or town (63), with a much higher growth rate. 35 of these 188 midsize cities are main; their analysis – that we do not

[10] This could be the linked to the fact that informality could be a substitute for institutional variables, and also to the kind of institutional variables we use.

report here - shows that their growth is driven by the same factors that explain changes of main cities (see paragraph 4). We then analyze only NMMs.

Table 4. Change in Population in Mega and Big cities (1960-2000)

Dependent Variable: Change **Pop. Mega and Big Cities**	(1)	(2)	(3)
average Share Urban Population	ns	ns	
Share Urban Population 1960			* (-)
change GDP per capita (1960-2000)		** (-)	*** (-)
average GDP per capita (1960-2000)	ns		
log of Land Area	*** (-)	*** (-)	*** (-)
average Political Regime	ns	ns	ns
average Share of Trade in GDP	** (-)	** (-)	ns
average Share of Agriculture in GDP	ns	* (+)	ns
average Informal Economy	** (+)	*** (+)	*** (+)
log average Foreign Market Potential	** (-)	** (-)	** (-)
Number of observations	39	39	39
Ajusted R square	,724	,766	,784

*** significant at 99%; ** significant at 95%; * significant at 90%; ns: non significant
Note: Most averages of variables are of their 1960,
Change indicates the log difference between t
Source: Urban dataset, our elaboration.

Table 5. Drivers behind the change in "non main" Midsize cities population (1960-2000)

Dependent Variable: Change **Pop. Midsize cities "non main"**	(1)	(2)	(3)
average Share Urban Population		ns	** (+)
Share Urban Population 1960	*** (-)		
change GDP per capita (1960-2000)	ns	ns	** (-)
log of Land Area	ns	ns	** (-)
average Political Regime	ns	ns	ns
average Share of Trade in GDP	ns	ns	ns
average Share of Agriculture in GDP	*** (+)	* (+)	*** (+)
Informality		*** (+)	
log average Foreign Market Potential	** (-)	*** (-)	*** (-)
Number of observations	141	139	141
Ajusted R square	,364	,398	,340

*** significant at 99%; ** significant at 95%; * significant at 90%; ns: non significant
Note: Most averages of variables are of their 1960,
Change indicates the log difference between

Also for NMM cities the relation between dimensional growth of cities and economic growth is insignificant or negative when significant (see table 5, eq. 3). A factors that positively affects their growth (remember that more than 80% are cities that have jumped to a midsize dimension from a smaller category) is the share of agricultural activities on GDP[11]. This negative relation is confirmed by the negative and significant coefficient (in eq. 1 of table 5) of the share of urban population at the beginning of the period. The counterintuitive fact that the "average" share of urban population during the period (instead of the initial one) has a positive coefficient (eq. 3) is perhaps linked to the fact that the growth of new cities that entered the midsize category has been very high, conducing to a process of very rapid change in the urbanization level of the countries where there are cities that have entered in the Midsize category and is, in our opinion linked to the positive relation between cities growth and informality (in eq. 2). Land dimension and the fact of being inserted in international markets (foreign market potential) lower their growth (as for MBs). In synthesis, as for bigger cities, also for NMMs the drivers of growth seem not linked with positive economic factors or factors linked to a mature structural change.

7. Growth in Small Cities: Performing Urbanism?

To complete our understanding of the urban system and the drivers that define the growth of the different groups of cities, now we analyze our last group: Small cities (0.5 to 1.5 mill inhabitants) that are "non-main". Their number[12] has doubled from 1960 to 2000 (from 205 to 440). Only 105 of 1960 small cities have remained in the same category: the other have substantially jumped to bigger sizes (also to big and mega dimensions), but 335 1960 towns have grown to this higher size (with a growth rate of more than 250%). So in fact, analyzing small cities in 2000 we are analyzing in particular the group of more than 300 cities that have grown to this size.

We have analyzed, as for the other typologies, the factors that are linked to their growth in the period. Our results are shown in table 6.

The most interesting fact is that Small cities represent the first type of cities that have their growth positively linked to the growth of GDP per capita in the period. Moreover,

[11] The same information come from the negative and significant sign of the share of urban population at the beginning of the period: see eq. 1 in table 5. In eq. 3 the substitution of the urban share at the beginning of the period with the average share in the whole period, generates a positive relation between growth and urbanization. It is, evidently, an effect of reverse causality: it is the strong growth of midsize cities (perhaps in non-big countries) that make the level of urbanization higher.

[12] In our database.

their growth is linked to trade (a second economic factor, which is linked with Krugman and Livas' hypothesis) and to good political regimes. All these dimensions seem to be related to the control of congestion factors through good urbanization policies and gains in the quality of urban services. Geographically, country dimension (Land area) lowers the growth of these cities: the bigger the countries the higher the number of cities with a lower individual growth; the same information comes from the negative coefficient of the variable measuring railway density that is linked, in a well performing urban structure, to a more disperse and less hierarchical urban structure; also to be a small "near-coast" city has a negative effect on growth, we think because in near coast small cities there are no strong first nature factors (e.g. being a "good" natural seaport). So the market and influence area can remain totally local (and perhaps, the hinterland served can be smaller, all other things equal).

Are then the factors that push small cities growth the sign of a performing urbanism? Surely this is a right answer, we think, for a group of small cities and of countries. On the other hand, 75% of 2000 small cities have grown to this size from a previous "town" level, with a very rapid growth and being in countries in development (low and middle income countries). This is why also some variables that are connected to a non complete structural change (like the share of agriculture on GDP and the level of urban and rural informality).

Table 6. Change in Population of Small cities "non-main" (1960-2000)

Dependent Variable: Change **Pop. Small cities "non main"**	(1)	(2)	(3)
average Share Urban Population		* (+)	
log Non Urban Population 1960	ns		
change GDP per capita (1960-2000)	*** (+)	*** (+)	** (+)
log of Land Area	*** (-)	* (-)	*** (-)
average Political Regime		*** (+)	*** (+)
Political Regime 1960	*** (+)		
average Share of Trade in GDP	** (+)	ns	ns
average Share of Agriculture in GDP	ns	*** (+)	* (+)
average Informal Economy		*** (+)	*** (+)
Railway density	*** (-)	*** (-)	*** (-)
Nearcoast		** (-)	** (-)
Number of observations	291	309	309
Ajusted R square	,374	,377	,373

*** significant at 99%; ** significant at 95%; * significant at 90%; ns: non significant

Note: Most averages of variables are of their 1960, 1970, 1980, 1990, 2000 observations. Change indicates the log difference between t and t-1

In synthesis, three elements: good institutions, openness, and economic progress seem to reinforce the growth process of this group of cities. Consequently, we think that in general Small cities growth are more linked to a *performing urbanization* process, where economic progress walk together with urban population changes, providing adequate conditions for economic growth.

There are small cities (in developing countries) that do not follow the described model of performing urbanism, but seem to be on the road of a subsequent growth towards a model of hyperurbanization like the one we found for midsize cities and like the 100 1960 small cities that have jumped to a midsize or even big/mega dimension in the period.

8. Conclusions

These results suggest that perhaps the international classification of cities according to the size should be revisited. We think that the concept of "intermediate cities", which balance the bigger centers in equilibrated urban systems, fits more with the "small city" category (that is centers with a dimension of no more than 1.5 million people) and is not so appropriate for the "midsize" group (with a dimension from 1.5 to 5 million people). As we saw, the midsize group has dimension and growth drivers much more similar to these of the big and mega cities and, in any case, shows signs of non-performing urbanism.

Taking these elements into consideration, our main findings on the analysis of changes in dimension of cities and on the feedback effects of urban structures (considered as a "deep" determinant) on growth, are:

1. The most important drivers behind the dimension of main cities are economic growth and maturity which are positively related to the dimension of main cities and to their growth. The other important economic variable, trade openness, is instead negatively correlated with main cities' dimension and growth. These are, *per se*, results that can be correlated with a performing general structure of the urban system. But there are also negative signals. Dimension and growth of main cities are positively correlated with bad politics and weak institutional systems. High concentration of power impels rural-urban migration towards main cities (usually capital cities) due to the presence of insecurity and other institutional elements that affect the hinterland, creating a

much more hierarchical urban landscape. In defining institutional characteristics, also historical events matter; for example colonial regimes, in particular the Spanish, have created conditions that have led to greater dimensions of main cities. If this tendency is maintained, probably most emerging regions will be facing increasing non-performing urbanization processes.

2. Emerging urbanization processes of large agglomerations (Mega and Big cities) seem to be in prevalence of the "non-performing" type. Growth of large agglomerations is not linked to economic growth; the only economic and institutional variable with a positive coefficient is informality. The dimension of the countries, measured by the extension of land (and related transport/migration costs) reduces MBs growth. So, large agglomerations are growing in presence of dysfunctional markets, which generate highly negative pecuniary externalities and few positive technological ones. The "planning" idea to create large agglomerations in developing countries to enhance economic development is at least debatable, because there is no evidence that this kind of urbanization is of performing type. Increasing urbanization and the rapid growth of the number of mega and big agglomerations can generate a more hierarchical structure of the urban system, which is self-reinforcing and gives raise to different types of diseconomies.
3. The drivers that expand Midsize cities are cumbersome. In general, this group of cities (of a dimension from 1.5 million inhabitants to 5 million) seems to be connected to economic backwardness (no link with variables of economic growth and structural maturity); they show a path similar to that of most main cities in developing regions.
4. Small cities present better signs of performing urbanization processes. Positive changes in GDP per capita, structural economic maturity and trade (openness) are positively linked to their growth. Also the presence of good regimes (and institutions) increase their size. We think that more attention should be given to this type of cities for pursuing less hierarchical urban structures and to avoid non-performing urbanization processes. However, there are also signs of weakness in their growth; the relation with informality suggests that without good urban policies in developing countries also the growth of small cities could follow the path of other centers of greater dimension.
5. Finally, we acknowledge that our research's outcomes cannot be conclusive due the limits of the methods and variable considered. These are: (1) the physical definition

of cities rather than a functional one; (2) the use of national variables to explain the urban agglomerations numbers (and related endogeneity problems); (3) the oversimplification of historical, institutional and social elements that are fundamental to understand different urban shapes; (4) the potential problems of collinearities (at least conceptually) between institutional elements and other economic and urban variables. These questions certainly demand further analysis.

References

Ades A. and Glaeser E. (1995), "Trade and Circuses: Explaining Urban Giants", *The Quarterly Journal of Economics*, vol. 110, no. 1, pp. 195-227.

Antikainen J. (2005). "The Concept of Functional Urban Areas: Findings of the ESPON Project 1.1.1.", *Informationen zum Raumentwicklung*, Heft 7.

Bertaud A. and Brueckner J.K. (2005), "Analyzing building-height restrictions: predicted impacts and welfare costs", *Regional Science and Urban Economics*, vol. 35, pp. 109– 125.

Cheshire, P.C. and Sheppard, S. (2004). *Land markets and land market regulation: progress towards understanding* London: LSE Research Online.

Cheshire, P.C. and Hay D.G. (1989). *Urban Problems in Western Europe: An Economic Analysis*, Unwin Hyman, London.

Christaller, W. (1933), *Die Zentralen Orte in Süddeutschland*, Jena: Gustav Fischer Verlag. Translated from German by C. W. Baskin (1966) The Central Places of Southern Germany, Englewood Cliffs, Prentice-Hall, New Jersey.

Davis J. and Henderson V. (2003), "Evidence on the political economy of the urbanization process". *Journal of Urban Economics*, vol. 53, pp. 98-125.

Erickson R. A. (1976), "The Filtering-Down Process: Industrial Location in a Non Metropolitan Area", *The Professional Geographer*, vol. 28, 3, pp. 254–260.

Fujita M. and Krugman P. (1995), "When is the Economy Monocentric? Thünen and Chamberlin Unified", *Regional Science and Urban Economics*, vol. 25, pp. 505-528.

Gaviria A. and Stein E. (2000), "The Evolution of Urban Concentration around the World: a Panel Approach", Intern-American Development Bank Research Department, Washington.

Gibrat R. (1931). *Les inégalités économiques*, Librairie du Recueil Sirey, Paris.

Glaeser E. and Shapiro J. (2001), "Cities and Warfare: The Impact of Terrorism on Urban Form", *Journal of Urban Economics, symposium on terrorism and the future cities*.

Henderson J. V. (2000), "The Effects of Urban Concentration on Economic Growth", *NBER*, Working Paper No. 7503.

Henderson J. V and Wang H. (2007), "Urbanization and City Growth: The Role of Institutions", *Regional Science and Urban Economics*, vol. 37, pp. 283-313.

Huang J *et. al.* (2007), "A global comparative analysis of urban form: Applying spatial metrics and remote sensing", *Landscape and Urban Planning*, vol. 82 pp. 184–197.

Krugman P. and Livas R. (1992), "Trade Policy and the Third World Metropolis", *Bureau of Economic Research*, Working Paper No. 4238.

OECD (2010), "*Trends in Urbanization and Urban Policies in OECD: What Lessons for China?*", Paris.

Van der Ploeg F. and Poelhekke S. (2008), "Globalization and the rise of Mega Cities in the Developing World", *Cambridge Journal of Regions, Economy and Society*, vol. 1, pp. 477-501.

United Nations (2010), *World Urban Prospects*, on line definitions and data .

United Nation (1974). *Manual VIII. Methods for projections of urban and rural population*, United Nations publication, Sales *No. E.74.XIII.3*No. E.74.XIII.3.

Appendix :

Box A1 – composition of regions

AFRICA
Northern Africa: Algeria, Egypt, Libyan, Morocco, Sudan, Tunisia, Western Sahara.
Eastern Africa: Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, Uganda, Tanzania, Zambia, Zimbawe.
Middle Africa: Angola, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of the Congo, Equatorial Guinea, Gabon.
Southern Africa: Botswana, Lesotho, Namibia, South Africa, Swaziland.
Western Africa: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Saint Helena, Senegal, Sierra Leone, Togo.
ASIA
Eastern Asia: China, Hong Kong SAR, Macao SAR, Dem. People's Republic of Korea, Japan, Mongolia, Republic of Korea.
South-Central Asia: Afghanistan, Bangladesh, Bhutan, India, Iran, Kazakhstan, Kyrgyzstan, Maldives, Nepal, Pakistan, Sri Lanka, Tajikistan, Turkmenistan, Uzbekistan.
South-Eastern Asia: Brunei Darussalam, Cambodia, Indonesia, Lao, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, Vietnam.
Western Asia: Armenia, Azerbaijan, Bahrain, Cyprus, Georgia, Iraq, Israel, Jordan, Kuwait, Lebanon, Palestina, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Turkey, United Arab Emirates, Yemen.
EUROPE
Eastern Europe: Belarus, Bulgaria, Czech Republic, Hungary, Moldova, Poland, Romania, Russian Federation, Slovakia, Ukraine.
Northern Europe: Denmark, Estonia, Faeroe Islands, Finland, Iceland, Ireland, Latvia, Lithuania, Norway, Sweden, United Kingdom.
Southern Europe: Albania, Bosnia and Herzegovina, Croatia, Gibraltar, Greece, Italy, Malta, Montenegro, Portugal, Serbia, Slovenia, Spain, Macedonia.
Western Europe: Austria, Belgium, France, Germany, Luxembourg, Netherlands, Switzerland.
LATIN AMERICA AND CARIBBEAN
Caribbean: Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, British Virgin Islands, Cayman Islands, Cuba, Dominica Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Netherlands Antilles, Puerto Rico, Trinidad and Tobago, Turks and Caicos Islands, Virgin Islands.
Central America: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama.
South America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela.
OFFSHOOTS
Northern America:Bermuda, Canada, Greenland, United States of America
Oceania: Australia, New Zealand, Australia, New Zealand.

Box A2 – Sources for our Urban dataset dataset[13]

Author/year	Type of variables	Dataset
Henderson (2002)	Demographic	World's Cities
Ethnologue Encyclopedia 16th Edition. M. Paul Lewis (ed.), (2009)	Demographic	Language Diversity
World Bank	Economic / Demographic	World Bank Data Catalog
LABORSTAT - International Labour Organization	Economic	LABORSTAT
Angus Maddison (2010)	Economic	Historial Statistics of Maddison
Deininger and Squire (1996)	Economic	Deininger and Squire
Schneider, Buehn and Montenegro (2010)	Economic	Schneider
Centre D'Etudes Prospectives et D'Informations Internationales (CEPII)	Geo-economic	Geo-cepii
Centre D'Etudes Prospectives et D'Informations Internationales (CEPII)	Geo-economic	Dist-cepii
Centre D'Etudes Prospectives et D'Informations Internationales (CEPII)	Geo-economic	Rmp-cepii
Canning and Farahani (2007)	Geo-economic	A Database of World Stocks of Infrastructure
Kim Dongsoo (2007)	Geo-economic	Zipf's parameters
Nunn and Puga (2010)	Geographic / Historical-institutional	Rugged
Polity IV Project (2010)	Historical-institutional	Polity IV

Box A3 – Main variables used in the analysis

Demographic and urban variables (for years from 1960 to 2000 if not otherwise indicated)
City population; Country population, urban and non-urban population; Population density, Primacy rate, Zipf parameter (only for 1995), Language diversity data

Economic variables
GDP and GDP per capita data (PPP), Inequality data (Gini Index), Trade (openness) data ((exports + imports)/GDP), Agricultural and industrial value added data, Shadow economy data.

Geo-economic variables
Internal distances data (a measure of the distance between produces and consumers), Geodesic distance between main cities (from the Dist-cepii dataset), Foreign Market Potential data (from Rmp-cepii dataset), is a proxy of the market potential of a location weighted by transport costs

Geographic variables
Land area, Desert area, Tropical climate area, Ruggedness, Country landlocked data, Railway data, Geographic dummies.

Historical-institutional variables
Legal system (Common law; French civil law: Socialist law; German civil law and Scandinavian law), Colonial origin (Spanish, British, French, Portuguese and Other European), Political regime data: Autocracy (authoritarian regime), Democracy, Composite Political Regime (combine the scores of both: autocracy and democracy) and Executive Recruitment or the way on which authorities arrived to power.

[13] Our urban dataset is available on demand. Please write to: johann.spitzer@unitn.it

Regressions

Table A3. Ades and Glaeser Revisited

Dependent Variable: log average **Pop. Main Cities** 1960-20	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(Constant)	3,783	1,325	2,504	3,309	2,468	2,471	2,113	1,942	3,892	3,973
	(2,054)	(0,548)	(0,948)	(1,693)	(1,391)	(1,387)	(1,174)	(1,079)	(2,395)	(2,723)
Dummy_cap	-,064	,017	-,081	-,091						
	(-0,322)	(0,082)	(-0,307)	(-0,430)						
LNavgnonurbpop60_00	,270	,270	,351	,295	,261	,258	,270	,290	,264	,236
	(2,463)	(2,424)	(2,303)	(2,611)	(2,461)	(2,409)	(2,537)	(2,708)	(2,474)	(2,285)
LNavgpopurboutmain60_00	,303	,298	,263	,289	,296	,296	,303	,269	,303	,361
	(2,781)	(2,653)	(1,679)	(2,634)	(2,983)	(2,973)	(3,047)	(2,633)	(3,030)	(3,673)
LN_landareasqkm	-,020	-,016	-,104	-,017						
	(-0,387)	(-0,283)	(-1,135)	(-0,336)						
LNavgpcGDP60_00	,299	,470	,490	,320	,416	,429	,421	,483	,263	,207
	(1,978)	(2,739)	(2,378)	(1,951)	(2,736)	(2,744)	(2,774)	(3,142)	(1,811)	(1,597)
avgAgr_GDP60_00	-,015	-,015	-,018	-,018	-,014	-,014	-,013	-,012	-,016	-,013
	(-1,969)	(-1,609)	(-1,579)	(-1,967)	(-1,858)	(-1,848)	(-1,714)	(-1,670)	(-2,099)	(-1,758)
avg_trade60_00	-,005	-,007	-,005	-,005	-,005	-,006	-,005	-,005	-,005	-,003
	(-2,247)	(-2,483)	(-1,615)	(-2,116)	(-2,373)	(-2,360)	(-2,311)	(-2,265)	(-2,251)	(-1,066)
avgPolity_6000	-,041	-,034	-,044	-,039	-,029	-,028	-,034	-,035	-,033	-,026
	(-3,193)	(-2,448)	(-2,386)	(-2,897)	(-2,257)	(-2,074)	(-2,488)	(-2,666)	(-2,663)	(-2,039)
avgExec_6000	,004	,005	,008	,005						
	(0,724)	(0,859)	(0,789)	(0,927)						
Informeco_GDP		,009		,006						
		(1,489)		(0,998)						
LNavgFMP_6000		,040								
		(0,3649)								
avgDens_road6000			,012							
			(1,065)							
avgDens_rail6000			-,585							
			(-1,301)							
AFR	,035	,450	,372		,453	,434	,455	,504		
	(0,1543)	(1,503)	(1,051)		(1,706)	(1,601)	(1,717)	(1,870)		
LAC	,537	,701	,740		,765	,719	,741	,813		
	(2,704)	(2,719)	(2,426)		(3,570)	(2,918)	(3,448)	(3,813)		
ASIME		,537	,420		,447	,421	,397	,549		
		(2,263)	(1,371)		(2,186)	(1,952)	(1,898)	(2,648)		
WEUOFF						-,097				
						(0,386)				
Nearcoast							,002			
							(1,125)			
Ruggedness								-,072		
								(-1,302)		
Desert								-,014		
						(-0,386)		(-1,909)		
Colon_SP				,464					,504	
				(2,242)					(2,645)	
Colon_GB				-,168					-,215	
				(-0,990)					(-1,368)	
Colon_FR				,166					,155	
				(0,764)					(0,749)	
Common										-,550
										(-2,238)
Civil										,012
										(0,052)
Socialist										-,468
										(-1,771)
Number of observations	117	112	87	112	117	117	117	117	117	117
Ajusted R square	0,743	0,752	0,695	0,748	0,757	0,756	0,758	0,763	0,756	0,763

t-statistic in parenthesis

Source: Urban dataset, our elaboration.

Note: Most averages of variables are of their 1960, 1970, 1980, 1990, 2000 observations.

Table A4. Change in Population in Mega and Big cities (1960-2000)

Dependent Variable: Change **Pop. Mega and Big Cities**	(1)	(2)	(3)
(Constant)	9,629	7,443	7,176
	(3,670)	(4,068)	(4,108)
avg_shrub6000	0,003	-0,003	
	(0,363)	(-0,554)	
shurb_60			-0,0106
			(-1,703)
LNavgpcGDP60_00	-0,162		
	(-0,898)		
ChLNpcGDP00_LNpcGDP60		-0,182	-0,250
		(-2,032)	(-2,609)
LN_landareasqkm	-0,288	-0,240	-0,213
	(-5,549)	(-4,716)	(-4,102)
avgPolity_6000	-0,008	-0,008	-0,003
	(-0,761)	(-0,842)	(-0,312)
avg_trade60_00	-0,013	-0,010	-0,008
	(-2,308)	(-1,882)	(-1,466)
avgAgr_GDP60_00	0,0186	0,021	0,011
	(1,411)	(1,902)	(1,076)
Informeco_GDP	0,014	0,015	0,0143
	(2,247)	(3,179)	(3,130)
LNavgFMP_6000	-0,270	-0,232	-0,207
	(-2,527)	(-2,271)	(-2,083)
Number of observations	39	39	39
Ajusted R square	,724	,766	,784

t-statistic in parenthesis
Most averages of variables are of their 1960, 1970, 1980, 1990, 2000 observations.
Source: Urban dataset, our elaboration.

Table A5. Change in Population of "non-main" Midsize cities (1960-2000)

Dependent Variable: Change **Pop. Midsize Cities "non main"**	(1)	(2)	(3)
(Constant)	8,685	3,745	6,068
	(4,137)	(1,692)	(2,707)
LNnonurbp_60	-,234		
	(-3,243)		
avg_shrub6000		,005	,019
		(0,508)	(2,299)
ChLNpcGDP00_LNpcGDP60	-,122	-,132	-,330
	(-0,703)	(-0,768)	(-2,153)
LN_landareasqkm	-,031	-,020	-,143
	(-0,403)	(-0,280)	(-2,132)
avgPolity_6000	-,009	-,005	-,021
	(-0,751)	(-0,336)	(-1,562)
avg_trade60_00	-,007	,005	-,001
	(-1,082)	(0,768)	(-0,130)
avgAgr_GDP60_00	,037	,026	,051
	(4,966)	(1,668)	(3,813)
LNavgFMP_6000	-,242	-,270	-,318
	(-2,188)	(-2,537)	(-2,882)
		,030	
		(3,750)	
Number of observations	141	139	141
Ajusted R square	,364	,398	,340

t-statistic in parenthesis
Most averages of variables are of their 1960, 1970, 1980, 1990, 2000 observations.
Source: Urban dataset, our elaboration.

Table A6. Change in Population of Small cities “non-main” (1960-2000)

Dependent Variable: Change **Pop. Small cities "non main"**	(1)	(2)	(3)
(Constant)	4,957	2,923	3,750
	(5,119)	(2,161)	(2,957)
avgnonurbpop60_00		,000	
		(-1,716)	
LNnonurbp_60	-,028		
	(-0,418)		
ChLNpcGDP00_LNpcGDP60	,393	,276	,208
	(3,211)	(2,802)	(2,297)
LN_landareasqkm	-,240	-,141	-,191
	(-2,906)	(-1,882)	(-2,736)
avg_trade60_00	,008	-,001	-,001
	(1,948)	(-0,206)	(-0,288)
avgAgr_GDP60_00	,007	,015	,006
	1,024	(2,481)	(1,879)
Dens_rail60	-1,946		
	(-6,735)		
avgDens_rail6000		-1,579	-1,812
		(-4,474)	(-5,547)
Polity_60	,045		
	(6,644)		
avgPolity_6000		0,020	0,024
		(2,672)	(3,504)
Nearcoast	-,009	-,005	-,004
	(-4,347)	(-2,316)	(-2,093)
Informeco_GDP		,014	,015
		(2,560)	(2,815)
Number of observations	291	309	309
Ajusted R square	,374	,377	,373

t-statistic in parenthesis

Most averages of variables are of their 1960, 1970, 1980, 1990, 2000 observations.

Source: Urban dataset, our elaboration.