Political Centralization and Urban Primacy:

Evidence from National and Provincial Capitals in the Americas

Sebastian Galiani

Washington University in St. Louis

and

Sukkoo Kim

Washington University in St. Louis and NBER

August 2010

We are grateful to Ed Leamer, Naomi Lamoreaux, two anonymous referees and participants of the conference honoring the contributions of Kenneth Sokoloff at UCLA for their comments. Maximiliano Appendino, Andres Drenik, Fernando Yu and Ivan Torre provided excellent research assistance. We thank the Weidenbaum Center at Washington University in St. Louis and the Bradley Foundation for invaluable research support.

Abstract: In this paper, we explore the causes of urban primacy in the Americas using the insight that primate cities are often political capitals. Using extensive data on cities, we estimate the impact of capital city status on urban concentration after controlling for geographic, climatic and economic factors. We find that political capitals, both national and provincial, contribute significantly more to urban concentration in Latin America than in the U.S. We suggest that one possible cause of the differing patterns of urban development in the Americas is the differences in the centralization of political power, a factor which has deep colonial roots.

"All over the world it is the Law of the Capitals that the largest city shall be super-eminent, and not merely in size, but in national influence." Jefferson (1939) "The Law of the Primate City"

1. Introduction

In his pioneering article, Jefferson (1939) extolled the virtues of the largest or the primate city of each nation. For Jefferson, in almost every country, the primate city, usually a capital city, housed the finest wares, the rarest articles, the greatest talents and skilled workers and, more importantly, was the center of its national culture, pride and influence. According to Jefferson's calculations, the national capitals of many Latin American nations such as Mexico, Peru, Argentina, Cuba, Bolivia and Chile followed this pattern as did those of many European nations. Jefferson was also aware that America was a major exception to this rule. While "capital" was synonymous with "primate city" almost everywhere else, it was not so in America. In America, the word "capital" was limited to political capitals, often very unimportant towns. But at the same time that America distinguished itself from the rest of the countries -or, at least those of its same hemisphere- because of the unimportant cities where political authorities had their seat, it also enjoyed a highly superior level of welfare. Could these two facts be related?

In this paper we intend to present an answer to that question by exploring the causes of urban primacy in the Americas and linking them to the long-run determinants of growth. To study these issues we use Jefferson's general insight that urban primacy is often characterized by a disproportionate concentration of population in capital cities.[1] However, unlike Jefferson's and

1 In Latin America, Morse (1971), using the share of the population of the largest city as a measure of primacy, finds that urban primacy arose in Argentina and Cuba around 1800, in Coloumbia, Mexico, and Peru in 1850, and in Brazil and Venezuela by 1900. In all of these cases, the primate city was also the national capital. McGreevey (1971), using a measure based on the Pareto distribution of city sizes, dates the rise of urban primacy in Mexico to as early as 1750, Cuba to 1825, Chile to 1830, Argentina to 1850, Brazil to 1880, Peru to 1925, and Venzuela and Colombia to 1950. By 1970, Portes (1976) argues that most Latin American countries, except perhaps Brazil and Colombia, exhibited significant urban primacy charateristics. In the U.S., by contrast, urban primacy is rarely seen

most other studies which focus on the impact of national capitals, we also investigate the role of provincial or state capitals in Latin America and the U.S. In Latin America, not only is the national capital often the largest city in the nation, its provincial capitals are also often the largest cities in its provinces. By contrast, in the U.S., where urban primacy is not a major feature of its urban development, its national capital is not the largest city in the nation and the majority of its state capitals are often quite small.

We suggest that these differing patterns of capital city development in the Americas is most likely caused by differing levels of political centralization that can be traced back to colonial times. When political power is centralized in the executive branches of the federal and provincial governments, as is the case in much of Latin America, government resources and regulations are most likely to benefit the capital cities at the expense of noncapital cities and rural areas. On the contrary, when political power is decentralized in state and local governments, as is the case in the U.S., the distribution of government resources will often depend on the competitive ability of local and state governments to raise revenues from their economic bases. In the U.S., the devolution of political power has also tended to redistribute incomes from the wealthy to poor areas. To the point that urban primacy boosted by centralized regimes may entail productivity losses –namely, by misallocating resources, it is clear that certain institutional arrangements may be less conducive to growth in the long-term. In fact, urban primacy may be one of the factors that account for the persistence of institutions across time: Acemoglu et al. (2001) have shown that the present institutional structure in most developing countries mirrors the one set up by European colonial empires between the sixteenth and the eighteenth centuries and is responsible for present differences in income between

---

as a key feature of its urban development; the distribution of city sizes have favored the medium to small size cities over time (Kim (2000)).

countries. In terms of our analysis, it could be said that centralized colonial regimes resulted in unbalanced and inefficient distributions of population that, at the same time that hindered growth, conditioned and limited further institutional change.

We motivate our empirical study by considering some theoretical arguments that suggest that urban primacy depends on productivity and political centralization. On the one hand, assuming a politically decentralized region where the mainland and the hinterland independently choose their level of taxes and of public goods investment, primacy only arises if the mainland is more productive than the hinterland. On the other hand, in a nation/region said to be politically centralized –where the mainland government has the power to set taxes and levels of expenditures on the public goods of both mainland and hinterland economies-, primacy depends on productivity and on the relative importance the government gives to the welfare of each location's residents. If mainland citizens are considered more important than hinterland citizens, then urban primacy will arise; however, if the government is more balanced in its valuation of the different citizens' welfare, then urban primacy is lower than in the decentralized scenario. Thus, we suggest that the relationship between political centralization and urban primacy depends critically on the relative weight given to the mainland relative to the hinterland economy in a central government's welfare function. We also sketch some arguments that explain why urban primacy may be associated to resource misallocation and, in the long run, productivity losses. This is particularly important since it may partly explain differences in long term growth performance between British North America and Latin America after both regions gained independence from their metropolis.

In order to estimate the impact of capital cities on urban primacy in the Americas, we construct extensive data on all cities greater than 2,500 and 25,000 for 7 Latin American

countries in 1900 and for 18 Latin American countries and the U.S. in 1990. It is important to note that our data set differs significantly from those of earlier studies such as Ades and Glaeser (1995) and Henderson (2002) whose samples consist only of the largest national capital and noncapital cities around the world. Unlike these studies, we are able to estimate the impact of national and provincial capital city status on population in comparison to the full sample of noncapital cities within each country controlling for other factors which might cause population concentration.[2] As controls, we include geographic variables such as land area, longitude, latitude, coastal perimeter, and nearness to port or navigable river, climate variables such as temperature, rainfall, and sunshine and, in the case of U.S., some economic variables as well.

Our estimates indicate that the impact of national capital status on population concentration in Latin America was already quite significant by the beginning of the twentieth century and only grew in importance over time. Using only land area as the control variable to maintain consistency across countries, we find that in 1900, the national capital status increased population by 523%, but by 1990, the figure rose to 677% for the same sample (919% for the full sample) in 1990.[3] On the other hand, the impact of provincial capital status in Latin America was quite modest in 1900 as it increased population by 70%; however, its impact rose to 353% by 1990 (232% for the full sample).

The relative importance of national and provincial capital statuses on population concentration also varied by countries in Latin America. In 1900, the national capital city status

2 For example, in Ades and Glaeser's (1995) sample, 77 out of 85 cities are national capitals; thus, when they drop noncapital cities from their analysis, their results are unchanged.

3 In general, the estimated coefficients on capital city dummy variable is relatively robust to the inclusion of other control variables. While the use of land area as a control variable might be seen as problematic as land area is partly endogenous, our results are even sharper if land area is excluded. In addition, most other studies such as Ades and Glaeser (2005) and Henderson (2002) also include land area as one of the independent variables. More recently, Campante and Do (2009) propose a new method for studying the impact of spatial concentration around a center or capital point. For important earlier cross-country studies on urban primacy, see Rosen and Resnick (1980) and Wheaton and Shishido (1981).

increased population concentrations by extraordinary amounts for Argentina and Brazil but slightly less so for Cuba, Chile and Uruguay. However, for provincial capitals, the impact was only significant for Brazil. In 1990, for which we have data for a larger sample, the national capital city effect was most significant for Mexico followed by Argentina, Paraguay, Colombia and Peru. The provincial capital city effect generally increased for most countries over time, but it was much more significant for Brazil, Colombia, and Mexico than countries like Nicaragua, Guatemala, El Salvador, Paraguay, Honduras, and Panama.

For the U.S., by contrast, the impact of national and state capital statuses on population concentration was quite modest in 1900 as they increased population by 70% and 15-29%, respectively. However, by 1990, the impact of the national capital status on population grew sharply to 475% whereas the figure remained relatively modest for state capital status at only 38%. Thus, according to our estimates, the main difference between U.S. and Latin America by the end of the twentieth century was in the differing importance of provincial or state capital status on population concentration.

The fact that differences in the degrees of urban primacy between U.S. and Latin America grew over time is particularly interesting since it is correlated with the growing income gap between the same regions during the same period. In fact, whilst in 1900 the U.S. income per capita was about 3.67 times the Latin American one, in 1990 it was 4.57 times (data from Maddison, 2003).

While the lack of generally accepted measures of political centralization makes it extremely challenging to link this factor to our empirical evidence on national and state capital statuses, we believe that there is a variety of evidence which can be used to support our hypothesis that urban primacy is caused by political centralization. With some important

variations, whether unitary or federal, most scholars believe that political power is highly centralized in the executive branches of federal and provincial governments in Latin America (Nickson (1995)). First, most of the powerful political and economic elites, including large landowners, live, work and socialize in capital cities. Second, the power to generate tax revenue is highly centralized in the federal government and the provincial and local governments rely on national transfers which are determined politically rather than economically (Sokoloff and Zolt (2006)). Third, until recent times, the political and policing powers of the national capital city was under the control of the president and the federal government in many countries (Meyers and Dietz (2002)).

Moreover, as we suggest in our theoretical section, there is considerable evidence that political centralization in the national and provincial capitals led to a significant bias in the distribution of government resources to the capital cities in Latin America (Myers (2002)). Most scholars consider Mexico to be one of the most politically centralized in Latin America as the federal government collects more than 90% of government revenues. Most of the revenues were likely to be funneled to capital cities and the remaining local governments received only 4% of those revenues in 1990 ((Nickson (1995), (Diaz-Cayeros (2006)). In the earlier period under Porfirio Díaz, the era between 1876-1911, it is estimated that Mexico City received more than 80% of all government investments in infrastructure (Kandell (1988)). While Argentina is seen to be less centralized than Mexico (Diaz-Cayeros (2006)), economic development was also severely biased in favor of capital cities due to centralized government decisions.

In the U.S., by contrast, political power was highly decentralized toward states and localities until the second half of the twentieth century when the federal government became more centralized (Skowronek (1982)). However, U.S. state governments, unlike Latin American

provincial governments, remain relatively decentralized as state legislatures continue to be strongly influenced by state-wide constituents. Political decentralization, as predicted by our model, also led to the competitive distribution of public goods across localities. Thus, between 1840 and 1990, local government expenditures represented the highest shares of government expenditures in the U.S. (Wallis (2000)). In the second half of the twentieth century, federal taxes and expenditures rose significantly, suggesting the growing centralization of power in the federal government. However, due to checks and balances on executive power stemming from local Congressional representation, the relative weight given to states and localities is likely to be much more balanced in the U.S. than in most of Latin America.

Finally, a last concern for our paper is the fact that the "capital city" effect we capture in our regression may be, nevertheless, subject to endogeneity issues. To deal with them we show evidence that, unlike Europe and elsewhere, where endogeneity of the location of capital cities may be a major problem (Ades and Glaeser (1995)), the forces which led to the location of political capitals in the Americas were largely exogenous from an economic point of view. In Latin America, national and provincial capitals were almost always important political capitals of the Spanish and Portuguese empires, most of which were initially chosen for military reasons (Portes (1976), Cortés Conde (2008)). In the U.S., by contrast, the majority of capitals were founded or relocated in geographically central but undeveloped areas for political reasons. To illustrate our case, we trace the political factors which led to the founding of the locations of political capitals in Argentina and the U.S.

This paper is organized as follows. In section 2, we present our theoretical arguments about political centralization and population distribution. In section 3, we estimate the impact of national and state/provincial capital statuses on population concentration for Latin America and

the United States between 1900 and 1990. In section 4, we explore the historical link between political centralization, capital city concentration and urban primacy. In section 5, we examine in some detail the forces which led to the founding of capital cities in the U.S. and Argentina. In section 6, we conclude our paper with a summary.

2. Centralization and Urban Primacy – an analytical framework

In this section we will discuss theoretical considerations based on a model of political centralization and population distribution that is presented in the appendix of this paper.

First of all, suppose a political region divided into two locations -the main city and the hinterland- in which a central government doesn't exist – an arrangement akin to a loose confederation that is fully economically integrated and where migration between locations is costless. Which should be the pattern of distribution of the population? As there is complete labor mobility, wages are expected to be the same across the region – to achieve that, initial differentials in productivity should be compensated by population movements. Therefore, intrinsically more productive locations –because of geographical reasons, for instance- are expected to be relatively more populated than less productive locations. This result also holds if we include in our analysis local governments that tax and provide public goods; as long as they perform those activities within their location –that is, the hinterland or the mainland governments only tax their respective inhabitants and provide public goods only to them-, the population will distribute according to differences in productivity; the level of public goods provision in the more productive region is expected to be higher as the level of taxes that can be withstood is higher. Initial productivity differentials may remain unaltered or be magnified – but never reversed.

The situation is different when local governments are replaced by a unique central government, which taxes economic activity across the region and decides the distribution of public goods across locations. This last issue is crucial to our analysis: as long as public goods have a positive effect on productivity, some particular patterns of allocation in their provision may reverse geographically-driven differences in productivity, thus having consequences on the distribution of population. This brings us to a fundamental question: which are the determinants of public goods allocation across a political region? A simple political economy assumption would be to consider a central government with a welfare function that includes both the welfare of hinterland and mainland citizens. The importance the central government gives to each one will necessarily impact on the allocation of public goods: if the welfare of mainland citizens is considered to be more important to the central government than that of hinterland citizens, the practical consequence would be that mainland inhabitants will be provided with a relatively higher level of public goods than residents of the hinterland. If the mainland is initially more productive than the hinterland, then the productivity gap between them would be exacerbated and, consequently, the population will move accordingly. If, in a similar initial context, the central government is more worried about the hinterland residents' welfare, then the situation would be opposite: public goods provision would be greater in the hinterland, something that would contribute to a reversal in the productivity differentials and, therefore, a distribution of population biased towards the hinterland. Within the framework we have just sketched, then, urban primacy may arise from a centralized government that caters mainland citizens in a disproportionate way, exacerbating or even reversing productivity differentials in favour of capital cities and thus triggering incentives for the population to establish themselves physically close to political authorities.

Central governments that care about the mainland more than the hinterland not only cause urban primacy but also have economic consequences in the long run: in fact, they may entail an inefficient distribution of population. Suppose a case where the hinterland is vastly more productive than the mainland: in a decentralized regime, the former would be expected to be more populated than the latter. If, then, a centralized government emerges and taxes equally all the country but concentrates its investment in the mainland, what happens is practically a transfer of resources from the more productive region to the less productive one. The capital city becomes crowded with migrants coming from the hinterland, which leave their original site in order to have a better access to public goods. But if the productivity-enhancing effect of public goods is assumed to be variable -for instance, high productivity locations may benefit more from an additional unit of public good than low productivity locations-, then there may be an efficiency loss in reducing the provision of public goods in the hinterland and raising it in the mainland; the transfer implies thus a misallocation of resources. In particular, suppose the productivity-enhancing effect of public goods has the shape of an inverted U – very low and very high productivity locations enjoy a small effect, whilst middle productivity locations benefit the most from public goods provision. In this sense, reallocating public goods provision away from the hinterland can entail efficiency costs both in situations where the mainland is comparatively more productive or less productive. As long as these efficiency costs persist in time, the urban primacy that emerges from a centralized regime may be partly responsible for long-term differences in productivity across countries with different political regimes. The case of British North America and Latin America, as we present in section 4, is particularly relevant in that respect.

3. Capital Cities and Urban Primacy

The analytical framework sketched in the previous section suggests that urban primacy is due to two important factors: economic factors which affect productivity and political factors which affect the geographic distribution of public goods. In this section, we attempt to identify the impact of political factors by estimating the influence of capital city status, both national and state/provincial, on population concentration after controlling for other factors which might affect productivity. In nations with centralized political power, the political and economic elites often reside in political capitals and have the means and the incentives to place a higher weight, γ, which increases urban primacy. Thus, capital city status is likely to capture the influence of political centralization on population.

The literature on urban primacy also provides a variety of reasons for why capital cities contribute to primacy. Capital cities may become significantly larger due to their advantage as the centers of governments.[4] First, government agencies and workers are concentrated in capital cities. Second, since governments make laws and redistribute income, capital cities may attract significant lobbying activity. To the extent that political corruption or rent seeking behavior contributes to primacy, their impact is likely to be manifested in the growth of capital cities.[5] Finally, capital cities may attract a disproportionate share of government resources for local infrastructure and amenities. In many Latin American countries, the political and economic elites

4 Ades and Glaeser (1995) argue that the political power of the capital city is greater when governments are weak and respond to local pressure, have large rents to dispense, and do not respect the political rights of the hinterland. They also argue that the benefits of proximity to political actors are likely to increase when influence comes from the threat of violence, distance makes illegal action more difficult to conceal, and distance lowers access to information and communication between political agents and government.

5 The primacy of Seoul, Korea has been associated with the need to locate in the capital city to lobby and obtain export and import licenses and loans from the Korean government bureaucracy (Henderson (2002)).

who disproportionately reside in capital cities may have little political incentives to distribute resources to smaller cities.[6]

We estimate the following equation:

(5) $\ln(pop)_i = \alpha_1 + \beta_1 Ncapital_i + \beta_2 Pcapital_i + \beta_3 Excapital_i + \beta_3 \ln(landarea_i) + \beta_4 X_i + \varepsilon_i$

where the Ncapital and Pcapital are dummy variables for whether a city is a national or provincial/state capital, Excapital for whether a city was a ex-national capital, landarea is the area of the city in km^2, and X_i are exogenous controls. For Latin America, the X_i control variables consist of the positional variables, latitude, longitude, altitude; the geographic variables, coastline and river dummies; and the climate variables, January, July, annual average temperatures and annual average precipitation. For the U.S., our control variables differ somewhat due to data availability.

The data consist of all cities with populations greater than 25,000 for 7 Latin American countries and U.S. circa 1900, and for 18 Latin American countries and U.S in 1990. For Latin Ameican countries, we also have data for cities with populations greater than 2,500. Cities in general are defined as municipalities rather than as urban or metropolitan areas. In Latin America, we use the second administrative division; in the U.S., we use the municipality. We provide detailed information on definitions and sources of our data in the appendix.

Table 1 presents the basic descriptive information on the provinces and states of the countries in the Americas. There were considerable variations in the number, average population and land area of provinces/states across the countries. In general, the larger countries such as the

6 In Argentina, for example, Walter (1993) writes that economic and political elites, including the agricultural land owners of the Pampas, live in their capital city of Buenos Aires. A similar story unfolds in Chile where the landed and capitalist elites intermarried and formed tight political bonds in their capital city of Santiago (Zeitlin and Ratcliff (1988), Walter (2005)).

U.S., Brazil and Mexico generally had a greater number of provinces/states as well as higher average population per province/state.

Table 2 reports descriptive statistics of the cities in our regression data sample. As expected, the data suggest an increase in the urban concentration of population in the largest cities in Latin America as compared to those in U.S. over time. In 1900, for cities with populations greater than 25,000, the average size of cities in Latin America was less than half of those in the U.S.; however, by 1990, it was larger than those of U.S. In addition, whereas the number of cities in this size-category rose over 9 fold for the U.S. during this period, the increase in the number of cities in Latin America was much more modest.

In Table 3, we report the regression estimates for the pooled sample of Latin American countries for the period around 1900 and 1990. In Tables 4 and 5, we present similar regressions for the U.S. and the individual countries in Latin America, respectively.

The national and provincial capital statuses increased population in all countries but did so to a much greater extent in Latin America than in the U.S. Based on the 7 subset of Latin American countries in 1900, the data show that the importance of national capital status on population was already very high in 1900 and remained so through 1990; however, the relative importance of provincial capital status rose significantly over this period. By contrast for the U.S., the importance of national capital status rose over time but that of state capital status remained relatively unimportant over time.

The absolute values of the capital city coefficients were sensitive to the choice of sample size (population greater than 2,500 or 25,000). When cities are defined as having a population greater than 2,500, the national capital and provincial capital coefficients were much larger, especially for the latter.

The national capital status increased population by 523% for the 7 Latin American countries in 1900; in 1990, for the same sample of countries as in 1900, the figure rose slightly to 677%, whereas for the full sample of the 18 Latin American countries, the national capital status increased population by 918%. By contrast, the U.S., national capital status increased population by only 70% in 1900 but by 493% (216% for 1900 sample) in 1990.

Provincial capital status increased population by 70-127% for the 7 Latin American countries in 1900, but the figure rose to markedly to 353% in 1990 for the same sample of cities. For the full sample of 18 countries in 1990, the impact was slightly smaller at 232%. For the U.S., state capitals remained a much less influential magnet for population as their impact rose from 15% to 42% between 1900 and 1990. However, for the sample sample of 1900 cities, the impact of state capitals on population continued to remain tiny at 11% even in 1990.

As shown in Table 6, there were significant variations with the Latin American countries. For the smaller sample of countries in 1900, national capital city effect was already quite significant for Argentina and Brazil and, to a lesser extent for Cuba, Chile and Uruguay. On the other hand, provincial capital effect was only sizeable for Brazil. By 1990, the data indicate that the national and provincial capital city effects for a great majority of Latin American countries were greater than those for the U.S. In some countries like Mexico, Colombia and Peru, both national and provincial capitals played important roles; in Argentina and Chile, national capitals were more important than provincial capitals; and in Bolivia and Brazil, provincial capitals were more important than national capitals. However, Brazil's case is rather unusual since its national capital was changed from Salvador to Rio de Janeiro and then to Brasilia. In general, the importance of provincial capitals in Latin America seems have grown over time. This result is particularly important since it can be considered a proof of the historical persistence of urban

primacy; as long as the determinants of population distribution haven't changed during the twentieth century, the empirical evidence can also be the reflection of a set of institutional incentives that has remained unchanged – something in line with the arguments of Acemoglu et al. (2001) about the colonial origins of present differences in income.

In 1990, the impact of national capital status on population was the highest for Mexico (Mexico City) at 14,017% and then for Peru (Lima), Colombia (Bogota) and Argentina (Buenos Aires) at over 2,281%; by contrast, capitals in El Salvador (San Salvador), Brazil (Brasilia), Bolivia (Santa Cruz) and Costa Rica (San Jose) had lower impact than those of the United States (Washington D.C.) and Canada (Ottawa). Interestingly, Brazil's previous capital, Rio de Janeiro, enjoyed greater ex-capital status benefits than its current capital. For the same year, provincial capital status increased population by 1,167% in Brazil, 617% in Mexico, 464% in Colombia and 376% in Cuba. In Bolivia, Venezuela and Peru, the figure was around 282%; Argentina, Ecuador, and Chile was around 200%; only Honduras and Panama's provincial capitals had smaller impacts than the U.S. state capitals.

5. The historical roots of urban primacy in the Americas

Having presented the empirical results of our study, it is useful now to explore the historical process that is behind the present outcome. To do so, in this section we compare and contrast the forces which led to differences in political centralization in the Americas and, ultimately, to divergent patterns in urbanization. Central and South America had historically more centralized regimes than North America, which is deeply decentralized – even at municipal levels. As we will see, these differences may have probably emerged from different patterns of

colonial administration, which at the same time have been also determined by factor endowments as Engerman and Sokoloff (1997) suggest.

The modern United States were, in the sixteenth century, a vast and scarcely populated territory deprived of mineral resources considered valuable in the European continent in those times – the soil quality and climate made the region apt only for grain cultivation and livestock raising. Given the set of relative prices existent in that period -with precious metals and tropical products being highly valuated- those activities were not particularly profitable and, therefore, the flow of resources towards British North America was significantly lower than the one directed to the silver-mining regions of Mexico and Bolivia or to the coffee plantations in Brazil. In fact, the first settlers of North America were not economic migrants but, rather, political migrants, whilst the millions of Africans brought to Central and South America were used as slaves in mines and plantations. In this context, British North America saw the emergence of a *market-preserving federalism*, in terms of North et al. (2000). Northern American colonies faced strong competition between one another for scarce capital and labor and any colony which failed to promote and protect markets simply failed to grow and was ultimately lead to disappear; as North et al. indicate, successful colonies adapted local institutions to suit local needs. Colonial assemblies –where settlers were represented- were central in the administration system, which was funded with local taxes and provided for economic and religious freedom to the inhabitants. When Independence was achieved in the late eighteenth century, the newly founded United States were organized as prescripted by market-preserving federalism: the national government's powers were limited to truly national public goods such as national security, market integration and monetary stability - decisions influencing everyday economic and social issues were reserved to the states, whose different preferences could allow them to enact different laws. In

terms of the theoretical arguments mentioned in previous sections, then, the value given to the mainland's welfare by the federal authorities was quite low: the hinterland's welfare was key for the political stability of the country, given the great deal of autonomy the states enjoyed under the British Empire and expected to preserve after Independence. In fact, as North et al. point out, the revolutionary wars were triggered by the sudden eagerness for funding by the Crown after the Seven Years War – something seen by Americans as a challenge to their financial autonomy. If such pattern was to be reproduced at the federal level -a central government eager for taxes collected from the states-, then the stability of the union itself could be threatened. Urban primacy in the United States was limited not only by the relatively balanced interest of the authorities on the welfare of its citizens but also by the rather uniform productivities across the original thirteen colonies: in fact, *market-preserving federalism* resulted in the failure of unproductive colonies and, ultimately, in the survival of the most productive ones – whose productivity should have been similar in a competitive common market.

The pattern for Spanish America was radically different. As indicated by Cortés Conde (2008), the Spanish colonial administration was completely centered on the exploitation of silver mines in New Spain (modern Mexico) and the Upper Perú (nowadays Bolivia): as the mines were located far from coasts and navigable rivers, the Spanish were forced to establish a transport network formed by several cities that served both as waypoints on the long journeys and also provided the mining areas with basic supplies. The centrality of silver mining owed not only to the high intrinsic value of its produce, but also to the short-term horizon of the Spanish Crown, not interested in long-term economic development of its colonies. All these geographical and political considerations resulted in a large and heavily centralized administration. In order to ensure the flow of bullion to Spain, the Crown concentrated trade only in four ports across two

continents (one in Spain and three in the Americas) and restricted intercolonial trade. As Cortés Conde points out, the local representative of the King –the Viceroy- did not share his power with local assemblies, which lacked any autonomy. Taxes were decided by officials appointed in Spain and its revenues were sent to the Crown after deducting the expenses of local administration. When the Spanish American colonies became independent in the early nineteenth century, the institutional organization they inherited was, thus, heavily centralized: as the colonial political system was based on the exchange of economic and political rights by support and loyalty to the Crown (North et al., 2000), rent-seeking lobbyist were expected to locate themselves close to the Viceroy's seat. The cities that were the seat of Viceroys and General Captains during the Spanish domination became the capitals of the new countries, whose organization intended to reproduce at local scale the old colonial system. In this sense, the welfare of the mainland –as opposed to the hinterland's one- was of special importance for the new independent authorities, since the most important corporations and lobbyists which the previous regime had catered for with privileges in exchange for loyalty were located in the national capitals. The organization of Latin American states was nevertheless not a rapid process: in spite of the centralizing forces of the new institutional regime, the disappearance of the Spanish colonial authority led many sub-national entities to revolt and claim for their autonomy – only after several years of internal fighting did the new nations find a stable political equilibrium which, in almost all of the cases, mirrored the colonial organization. Except for Mexico, Argentina and Venezuela, the rest of the Spanish Latin American countries organized themselves in a unitary system. And even in the federal countries, the capital cities were among the winner parties of the civil wars.

After the dust had settled, the historical comparison of the economic development of the United States and Latin America showed a strikingly growing gap between them: in 1700, the per capita income of both regions was the same; in 1820 the U.S. one was 1.81 times the Latin American average, in 1870 it was 3.61 times, in 1900 3.67 times and in 1990 4.57 times (data from Maddison, 2003). If the different institutional arrangements of both regions may explain this growing income gap over time, then the politically-driven patterns of population distribution can account for a share of that difference. As we have described in the previous paragraphs, the institutional settings of British North America and Latin America were radically different and, whilst the former favored a more balanced distribution of population, the other one laid incentives towards concentration around the capital city.

6. Case Studies: United States and Argentina

One last point issue of concern to our analysis is the fact that political capitals may have been chosen because of particular economic characteristics that we didn't take into account in our empirical analysis carried out in section 3. In order to rest assured that it wasn't the case, in this section we describe the historical process by which two different countries in the region – the United States and Argentina – determined both their national and provincial capitals, showing that mainly political factors –and not economical ones- were behind those decisions. The events surrounding the establishment of the national capitals of the United States and Argentina are a clear depiction of their different political and economic settings. In the first case, market-preserving federalism had created a series of productive and autonomous colonies, whereas in the second case the old viceroyal seat, Buenos Aires, was the center of all the

economic and political activity of the country, with the rest of the urban agglomerations being almost deprived of resources.

In the United States, the representatives of the newly formed thirteen states debated repeatedly and contentiously over the location of the nation's capital between 1774 and 1790. The debate pitted the northern federalists who desired a strong federal government against southern antifederalists who favored a loose federation of decentralized state governments. Several factors militated against locating the capital in a major commercial center. Because of a famous incident in Philadelphia, the Congress unanimously agreed that the federal government rather than the state in which it is located would have complete jurisdiction of the federal city.[7] Given the lack of representation of the citizens of the federal district, many antifederalists feared the corrupting influences of locating the capital in a major commercial center.[8] Moreover, locating a federal district in a major commercial center created greater conflicts with the state in which it is located. Indeed, Philadelphia was removed as a candidate because Pennsylvania refused to yield its jurisdiction over its major port city.In the end, in 1790 James Madison, in a political bargain with Alexander Hamilton, secured the national capital in the South.

The Compromise of 1790 which established the location of the U.S. capital is well known. Hamilton, desiring a strong central government, desperately wanted the new national government to assume the state debts incurred during the Revolutionary War. The assumption of state debts, Hamilton believed, would align the incentives of the creditors with a strong federal government. However, Madison and other southerners viewed assumption as usurpation of state

7 In 1774, when the Continental army soldiers with arms demanded their pay and surrounded the Philadelphia State House where the Congress met, the congressmen requested the Philadelphia Council to disband the soldiers using their state militia. However, the Council refused and the Congress adjourned to Princeton, New Jersey. This famous incident caused Congress to seek exclusive jurisdiction over the federal district.

8 When Congress voted in 1783 to create a federal district with exclusive jurisdiction over no more than thirty-six square miles, antifederalists feared that the nation's capital would be larger and potentially more corrupt than Philadelphia or even London (see Bowling (1988)).

authority by the federal government and blocked it accordingly. In a well known dinner mediated by Thomas Jefferson, Madison and Hamilton reached a compromise. If Hamilton could deliver the location of the nation's capital in the South along the Potomac, Madison would allow the assumption bill to go through the House.

In Argentina, the fight over the location of the national capital was less about where to locate it than who would rule it as few places could compete against Buenos Aires. From its early beginnings, Buenos Aires was a commercial and administrative center for Spain. In 1618, it became the seat of a governorship over a vast territory; in 1776, it became a viceroyal capital that controlled the present-day areas of Argentina, Bolivia, Paraguay, Uruguay and northern parts of Chile. The primacy of Buenos Aires was based on the control of the Potosi silver trade through its port which was, nevertheless, not the best one in the Rio de la Plata Basin due to its extremely shallow draft. With the concentration of lawyers, bureaucrats, priests, military officers, artisans, soldiers, laborers and slaves, Buenos Aires possessed 40,000 inhabitants by the end of the eighteenth century. Thus, when Argentina became independent in the early nineteenth century, Buenos Aires had been the dominant political capital of region for almost 200 years.

With independence from Spain in 1810, the federalists of the hinterland provinces and the centralists of the Buenos Aires province fought repeatedly for the control of the city of Buenos Aires. Yet, no matter who won, the city of Buenos Aires remained the de facto capital. The collapse of the central government in 1820 led to more than thirty years of a virtual acephalic government, in which the powerful governor of Buenos Aires, Juan Manuel de Rosas, exercised most of the ordinary powers attributed to national authorities. When Argentineans established a constitutional government with strong centralized powers in the office of the presidency in 1853, presidents consistently vetoed attempts to locate the capital in Córdoba or Rosario –a port city

with even better conditions for the docking of ships than Buenos Aires- and chose Buenos Aires as the capital city (Rock (1987)). Since the only substantial and reliable government revenue came from duties and tariffs collected at the port in Buenos Aires, Scobie (1974, p.105) writes that the "control of the city became virtually synonymous with control of the nation, and any truly national authority took the city as its seat."[9] Initially, the constitution also designated the city of Buenos Aires as the federal capital to be independent of the province of Buenos Aires. But when Buenos Aires province refused to cede the control of its port city, the two governments shared the capital. When the dual use of the capital city proved unsatisfactory, the issue was finally resolved militarily as the federal forces claimed the city of Buenos Aires and detached it from the province of Buenos Aires in 1880.

In the U.S., political decentralization was a major force at both the national and at the state level in the choice of capital city locations. In the national sphere, states' rights decentralized power to the states, and in the state arena, power was further decentralized to small towns and rural areas as state legislatures limited the powers of the executive branch by locating capitals away from population centers and by implementing apportionment schemes favoring small localities. In the American colonies prior to independence, legislatures often met in major coastal cities such as Boston, New York and Philadelphia. With independence, however, the antifederalist state legislatures fought successfully to move state capitals to central locations

9 In 1790, New York city, like Buenos Aires in 1880, was a major commercial port city with a rich agricultural hinterland. It also possesed a sizeable potential government income from taxes on foreign trade. Why did New York city not evolve into a major political capital city like Buenos Aires? First, unlike Buenos Aires city which wielded significant influence over its province, New York city was a creature of the New York state. In the colonial period, the actions of the city council needed the approval of the governor (Burrows and Wallace (1999)). Second, the state's tax policies were dominated by small towns and farms who controlled the state assembly (Brown (1993)). Import taxes acted as a subsidy to the hinterland in terms of lower property taxes. Indeed, New York city could not even maintain its standing as its own state capital. Third, New York city, unlike Buenos Aires, could not create an artificial monopoly because it could not hinder trade to other port cities.

which were largely rural.[10] Thus, except for Massachusetts and Maryland, the other eleven former colonies moved their state capitals from the eastern coast to a geographically more central location.

In Argentina, many of the cities which became provincial capitals after independence, like Buenos Aires, were initially located by the Spanish Crown to serve as administrative and military centers. Because the Potosi silver mines in Upper Peru were in a remote location, these network of cities located in intervals of 150 miles started with fewer than 100 settlers each (Cortés Conde (2008), (Scobie (1988)). However, with the growth of the silver trade, these Spanish cities grew in administrative and commercial importance. At the time of independence from Spain, because of their size and political influence, these cities acquired territorial hegemony over its provincial area and essentially became de facto provincial capitals. As in Buenos Aires, the provincial landowners and elites resided in the capital and used their power to concentrate provincial resources in their city. But, unlike Buenos Aires, these provincial capitals often lacked sufficient fiscal resources and relied on provincial and national governments for expenditures of local public goods (Scobie (1988)). In most provinces, except for their capital, there were no other competing secondary cities.

In the United States, cities were creatures of states and state governments possessed authority over cities and other local governments. In Argentina, as elsewhere in Latin America, cities began as military outposts designed to control the indigenous population in the countryside. Thus, the jurisdiction of the city was not restricted to a specific area and often extended to the rural countryside (Portes (1976)). In Argentina, the capital cities controlled the

10 James Madison in 1790: "In every instance where the seat of Government has been placed in an uncentral position, we have seen people struggling to place it where *it ought to be*." Because travel in eighteenth century was difficult and time consuming, equal rights of inhabitants required the government to be as central as possible. See Zagarri (1987).

hinterlands; in the U.S., hinterlands often controlled the capital cities. In both cases, nevertheless, capital cities were chosen not because of economic considerations – but, rather, by political considerations. This allows us safely to conclude that, for the cases of the United States and Argentina, the long-run economic consequences of having a determined political regime – decentralized in one case, centralized in the other- are independent of the particular cities which were to become their national and provincial capitals.

7. Conclusion

This paper examines the causes of urban primacy in the Americas using the insight that the law of primacy is highly correlated with the "Law of Capitals." Using extensive data on cities in Latin America and North America, we estimate the impact of national and provincial capital city dummies on population controlling for a variety of factors which might contribute to urban productivity. We find that national and provincial capital city statuses played a much greater role in causing population concentration in Latin America than in North America. However, there were important variations across the countries within Latin America. The "Law of Capitals" seems to have held to a much greater extent in countries like Mexico, Argentina and Brazil but to a lesser extent in countries like Paraguay and El Salvador.

Our findings suggest that urban primacy in major Latin American countries such as Mexico, Argentina, Chile and others were caused by political centralization which placed greater weight on the welfare of capital city residents. In many Latin American countries, especially in those whose landownership was concentrated, major landowners often resided permanently in the national and provincial capitals. In these places, the political and economic interests of landowners and capitalists were intimately intertwined by marriage and many sought to control national and provincial affairs from their capital cities (Zeitlin and Ratcliff (1988)). For example,

in Argentina, the powers of the federal government were centralized in Buenos Aires as the capital city had substantial representation in national politics as it elected 20% of the congressional deputies and 2 of 30 senators. The president was the "immediate and local head of the Capital of the Nation" and appointed the municipal executive or the intendente (Walter (1993)).

In the U.S., by contrast, political and economic elites rarely resided in capital cities. Washington D.C. remained dismally backward and small well into the nineteenth century and has only recently become a major center of political lobbyists (Green (1962)). In most states, capitals were intentionally located in the small towns and rural areas in geographically central locations. Because rural and small town interests were often over-represented in state legislatures, the large urban centers, unlike their counterparts in Latin America, did not possess disproportionate political advantages. Consequently, national and state expenditures on infrastructures such as roads and highways and education were often biased toward rural areas and small towns and fostered the growth of smaller municipalities.

The variations in political centralization in the Americas is likely to have deep colonial roots (North (1991), Engerman and Sokoloff (1997, 2002), Acemoglu, Johnson and Robinson (2001)). In colonial Iberian Latin America, in contrast to colonial British North America, many contend that the Spanish and, to a lesser extent, the Portuguese, left a deep imprint of strong central governments and weak local governments (Portes (1976), Nickson (1995)). Whereas the cities and towns in the British American colonies, especially in the North, possessed considerable political autonomy in the election of city leaders, those in Latin America were often appointed or auctioned. Sokoloff and Zolt (2006) argue that the differences in early colonial inequality influenced the sources of revenues and expenditures for federal, state and local

governments in the Americas. In the U.S., localities were allowed to choose instruments of taxation such as property tax (Becker (1980)) whereas those in Latin America possessed a weak capacity to raise revenues as direct taxes on property were not allowed (Nickson (1995)).

References

Acemoglu, Daron, Simon Johnson and James A. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation," *American Economic Review* 91: 1369-1401.

Adelman, Jeremy. 1999. *Republic of Capital: Buenos Aires and the Legal Transformation of the Atlantic World*. Stanford: Stanford University Press.

Ades, A.F. and E.L. Glaeser. 1995. "Trade and Circuses: Explaining Urban Giants," *Quarterly Journal of Economics* 110: 195-227.

Allen, William C. 2001. *History of the United States Capitol: A Chronicle of Design, Construction, and Politics*. Washington DC: U.S. GPO.

Becker, Robert A. 1980. *Revolution, Reform, and the Politics of American Taxation, 1763-1783*. Louisiana State University Press.

Bowling, Kenneth R. 1988. *Creating the Federal City, 1774-1800: Potomac Fever*. Washington D.C.: American Institute of Architects Press.

Campante, Filipe R. and Quoc-Anh Do.2009. "A Centered Index of Spatial Concentration: Expected Influence Approach and Application to Population and Capital Cities," mimeo.

Carroll, Glenn R. and John W. Meyer. 1983. "Capital Cities in the American Urban System: The Impact of State Expansion," *American Journal of Sociology* 88 (3): 565-578.

Chase-Dunn, Christopher. 1985. "The Coming of Urban Primacy in Latin America," *Comparative Urban Research* 11: 14-31.

Coniff, Michael. 1981. *Urban Politics in Brazil: The Rise of Populism, 1925-1945*. Pittsburgh: University of Pittsburgh Press.

Cortés Conde, Roberto. "Spanish America Colonial Patterns: The Rio de la Plata" Departamento De Economia, Universidad de San Andrés.

Davis, Diane E. 1994. *Urban Leviathan: Mexico City in the Twentieth Century*. Philadelphia: Temple University Press.

De Luca, Miguel, Mark P. Jones and Mariá Inés Tula. 2002. "Buenos Aires: The Evolution of Local Governance," in *Capital City Politics in Latin America: Democratization and Empowerment*, edited by D. Myers and H. Dietz. Boulder: Lynne Rienner Publishers.

Diaz-Cayeros, Alberto. 2006. *Federalism, Fiscal Authority, and Centralization in Latin America*. Cambridge: Cambridge University Press.

Eisenstadt, Shmuel N. and A. Shachar. 1987. "Urbanization in Colonial Latin America," in *Society, Culture and Urbanization*, edited by S. Eisenstadt and A. Schachar. Newbury Park: Sage Publications.

Engerman, Stanley L. and Kenneth L. Sokoloff. 1997. "Factor Endowments, Institutions, and Differential Paths of Growth Among New World Economies: A View From Economic Historians of the United States," in *How Latin America Fell Behind: Essays on the Economic Histories of Brazil and Mexico 1800-1914*. Stanford University Press.

Engerman, Stanley L. and Kenneth L. Sokoloff. 2002. "Factor Endowments, Inequality, and Paths of Development Among New World Economies," *Economia* 3: 41-102.
Ennis, Huberto M., Santiago M. Pinto, and Alberto Porto. 2006. "Choosing a Place to Live and a Workplace," *Económica*, La Plata 52 (1-2): 15-50.
Gibson, Edward L. and Tulia G. Falleti. 2004. "Unity by the Stick: Regional Conflict and the Origins of Argentine Federalism," in *Federalism and Democracy in Latin America*, edited by E. Gibson. Baltimore: Johns Hopkins Press.
Green, Constance M. 1962. *Washington: Village and Capital, 1800-1878*. Princeton: Princeton University Press.
Henderson, J. Vernon. 2002. "Urbanization in Developing Countries," *World Bank Research Observer*, vol. 17, no. 1: 89-112.
Jefferson, Mark. 1939. "The Law of the Primate City," *Geographical Review* 29: 226-232.
Kandell, Jonathan. 1988. *La Capital: The Biography of Mexico City*. New York: Random House.
Kim, Sukkoo. 2000. "Urban Development in the United States, 1690-1990," *Southern Economic Journal* 66 (4): 855-880.
Kim, Sukkoo. 2009. "Institutions and U.S. Regional Development: A Study of Massachusetts and Virginia," *Journal of Institutional Economics* 5 (2): 181-205.
Lockhart, James and Stuart B. Schwartz. 1983. *Early Latin America: A History of Colonial Spanish America and Brazil*. Cambridge: Cambridge University Press.
McGreevey, William P. 1971. "A Statistical Analysis of Primacy and Lognormality in the Size Distribution of Latin American Cities, 1750-1960," in Morse, Richard, editor, *The Urban Development of Latin America 1750-1920*. Stanford: Stanford University.
Morse, Richard M. 1971. "Latin American Cities in the 19th Century: Approaches and Tentative Generalizations," in Morse, Richard, editor, *The Urban Development of Latin America 1750-1920*. Stanford: Stanford University.
Myers, David J. 2002. "The Dynamics of Local Empowerment: An Overview," in *Capital City Politics in Latin America: Democratization and Empowerment*, edited by D. Myers and H. Dietz. Boulder: Lynne Rienner Publishers.
Nickson, R. Andrew. 1995. *Local Government in Latin America*. Boulder: Lynne Rienner Publishers.
North, Douglass C. 1991. *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.
North, Douglass C., William Summerhill and Barry R. Weingast. 2000. "Order, Disorder and Economic Change: Latin America vs. North America" in *Governing for Prosperity*, edited by Bruce Bueno de Mesquita and Hilton Rooits. Yale: Yale University Press
Portes, Alejandro. 1976. "The Economy and Ecology of Urban Poverty," in *Urban Latin America*, edited by A. Portes and J. Walton. Austin: University of Texas Press.
Rock, David. 1985. *Argentina 1516-1987: From Spanish Colonization to Alfonsin*. Berkeley: University of California Press.
Rosen, Kenneth T. and Mitchel Resnick. 1980. "The Size Distribution of Cities: An Examination of the Pareto Law and Primacy," *Journal of Urban Economics* 8: 165-86.
Scobie, James R. 1974. *Buenos Aires: Plaza to Suburb, 1870-1910*. New York: Oxford University Press.
Scobie, James R. 1988. *Secondary Cities of Argentina: The Social History of Corrientes, Salta, and Mendoza, 1850-1910*. Stanford: Stanford University Press.

Siavelis, Peter M., Esteban Valenzuela Van Treek, and Giorgio Martelli. 2002. "Santiago: Municipal Decentralization in a Centralized Political System," in *Capital City Politics in Latin America: Democratization and Empowerment*, edited by D. Myers and H. Dietz. Boulder: Lynne Rienner Publishers.

Skowronek, Stephen. 1982. *Building a New American State: The Expansion of National Administrative Capacities 1877-1920*. Cambridge: Cambridge University Press.

Smith, Carol A. 1985. "Class Relations and Urbanization in Guatemala: Toward an Alternative Theory of Urban Primacy," in *Urbanization in the World-Economy*, edited by M. Timberlake. New York: Academic Press.

Solberg, Carl. 1970. *Immigration and Nationalism: Argentina and Chile, 1890-1914*. Austin: University of Texas Press.

Soo, Kwok Tong. 2005. "Zipf's Law for Cities: A Cross-Country Investigation," *Regional Science and Urban Economics* 35: 239-63.

Sokoloff, Kenneth L. and Eric. M. Zolt. 2006. "Inequality and the Evolution of Institutions of Taxation: Evidence from the Economic History of the Americas," mimeo.

Wallis, John J. 2000. "American Government Finance in the Long Run: 1790 to 1990," *Journal of Economic Perspectives* 14: 61-82.

Walter, Richard J. 1985. *The Province of Buenos Aires and Argentine Politics, 1912-1943*. Cambridge: Cambridge University Press.

Walter, Richard J. 1993. *Politics and Urban Growth in Buenos Aires: 1910-1942*. Cambridge: Cambridge University Press.

Walter, Richard J. 2005. *Politics and Urban Growth in Santiago, Chile 1891-1941*. Stanford: Stanford University Press.

Weingast, Barry R. 2009. "Second Generation Fiscal Federalism: The Implications of Fiscal Incentives," *Journal of Urban Economics* 65: 279-293.

Wheaton, W. and H. Shishido. 1981. "Urban Concentration, Agglomeration Economies and the Level of Economic Development," *Economic Development and Cultural Change* 30: 17-30.

Wiesner, Eduardo. 2003. *Fiscal Federalism in Latin America: From Entitlements to Markets*. Washington DC: Inter-American Development Bank.

Willis, Eliza, Christopher da C.B. Garman, and Stephen Haggard. 1999. "The Politics of Decentralization in Latin America," *Latin American Research Review* 34: 7-56.

Wilkie, James, Eduardo Aleman and Jose G. Ortega. 2000. *Statistical Abstract of Latin America*. Volume 36. Los Angeles: UCLA Latin American Center Publications.

Wilkie, Richard W. 1984. *Latin American Population and Urbanization Analysis: Maps and Statistics 1950-1982*. Los Angeles: UCLA Latin American Center Publications.

Young, James S. 1966. *The Washington Community 1800-1828*. New York: Columbia University Press.

Zagarri, Rosemarie. 1987. *The Politics of Size: Representation in the United States, 1776-1850*. Ithaca: Cornell University Press.

Zeitlin, Maurice and Richard E. Ratcliff. 1988. *Landlords and Capitalists: The Dominant Class of Chile*. Princeton: Princeton University Press.

Data appendix: Definitions and Sources

I. Latin America
Population is the total for second administrative division (municipality in general).
Sources for 1900: Argentina: National Census (1914); Brasil: National Census (1937); Chile: National Census (1907); Costa Rica: National Census (1892); Cuba: National Census (1097); El Salvador: National Census (1930); Uruguay: National Census (1908).
Sources for 1990: Argentina: INDEC, Censo Nacional de Población, Hogares y Viviendas (2001); Bolivia: INE, Censo Nacional de Población y Vivienda (2001); Brazil: IBGE, Contagem da População (2007) y Estimativas da População (2007); Chile: INE, XVII Censo Nacional de Población y VI de Vivienda (2002); Colombia: DANE, Censo General (2005); Costa Rica: INEC, IX Censo Nacional de Población y V de Vivienda (2000); Cuba: ONE, Anuario Estadístico Cuba (2006); Ecuador: INEC, VI Censo de Población y V de Vivienda (2001); El Salvador: DIGESTYC, VI Censo Nacional de Población y V de Vivienda (2007); Guatemala: INE, XI Censo Nacional de Población y VI de Habitación (2002); Honduras: INE, Censo de Población y Vivienda (2001); Mexico: INEGI, II Conteo de Población y Vivienda (2005); Nicaragua: INEC, VIII Censo Nacional de Población y IV de Vivienda (2005); Panama: DEC, X Censo de Población y VI de Vivienda (2000); Paraguay: DGEEC, Censo Nacional de Población y Viviendas (2002);Peru: INEI, X Censo de Población y V de Vivienda (2005); Uruguay: VIII Censo General de Población, IV de Hogares y VI de Viviendas - Fase I (2004); Venezuela: INE, XIII Censo General de Población y Vivienda (2001).
Landarea is squared kilometers for second administrative division.
Sources for 1900: Except for the case of Brazil, where the data were available, the land area of other countries was estimated using that of the contemporary second administrative division.
Sources for 1990: Argentina: INDEC, Censo Nacional de Población, Hogares y Viviendas (2001); Bolivia: INE, Estadísticas Departamentales 2005; Brazil: IBGE; Chile: INE, División Político-Administrativa y Censal 2001; Colombia: DANE, Costa Rica: Non Official Web Site (www.sitiosdecostarica.com) ; Cuba: ONE, Anuario Estadístico (2007); Ecuador: INEC; El Salvador: DIGESTYC; Guatemala: INE; Honduras: Asociación de Municipios de Honduras; Mexico: INEGI; Nicaragua: Instituto Nicaragüense de Estudios Territoriales; Panama: DEC; Paraguay: DGEEC; Peru: INEI; Venezuela: INE.
Latitude, Longitude, Altitude.
Sources: Google Earth: Release 4.3. Sea dummy, coastal perimeter (coast perimeter divided by total perimeter), river dummy were defined using country maps.
Average summer temperature (January), average winter temperature (July), average annual temperature, precipitation (mm).
Sources: World Meteorological Organization and National Statistical Institutes.

II. United States
1900: U.S. Census Bureau, Abstract of the 12th Census 1900. The river and port variables constructed using Google. map. Longitude, latitude from various websites.
1950: U.S. Census Bureau, Statistical Abstract of the U.S., 1955
1990: U.S. Department of Commerce, City and County Data Book, 1994

Table 1

Descriptive Statistics of the Provinces/States in the Americas

	Number	Population (1,000) Average (sd)
Argentina	24	1510.8 (2757.6)
Bolivia	9	919.4 (820.0)
Brazil	27	6809.7 (8184.0)
Chile	53	285.2 (647.1)
Colombia	32	1295.9 (1831.2)
Costa Rica	7	544.3 (382.0)
Cuba	15	749.3 (467.0)
Ecuador	24	503.5 (704.7)
El Salvador	14	410.3 (365.1)
Guatemala	22	510.0 (497.4)
Honduras	18	337.6 (298.4)
Mexico	32	3228.6 (2793.7)
Nicaragua	17	300.7 (268.6)
Panama	12	236.6 (376.4)
Paraguay	18	286.8 (315.6)
Peru	26	1003.8 (1289.1)
Uruguay	-	
Venezuela	24	960.5 (756.9)
United States	49	5042.0 (5486.6)

Table 2

Descriptive Statistics: Cities in the Americas

	1910* Urbanization	2000	c1900 (2,500+) Number	Average (sd)	c1900 (25,000+) Number	Average (sd)	c1990 (2,500+) Number	Average (sd)	c1990 (25,000+) Number	Average (sd)
Argentina	31.2%	89.4%	365	21257 (84654)	73	67779 (182644)	489	74074 (180553)	245	136022 (239671)
Bolivia	4.3	64.8	-		-		109	75865 (190537)	68	113769 (233706)
Brazil	10.7	81.3	1469	28764 (60656)	566	51163 (93238)	5270	34777 (203018)	1222	116848 (411056)
Chile	14.5	84.6	79	41016 (48918)	50	54250 (57539)	52	290655 (652191)	44	341547 (698033)
Colombia	7.1	74.9	-		-		1054	39256 (237976)	251	130904 (476827)
Costa Rica	9.0	51.9	29	8261 (7887)	2	32505 (9344)	81	47039 (49751)	49	67783 (54715)
Cuba	15.1	75.3	124	17418 (29380)	17	60058 (64878)	155	72510 (180618)	134	80959 (192978)
Ecuador	9.1	62.4	-		-		214	56454 (191369)	97	110426 (275365)
El Salvador	6.3	46.6	159	7986 (10577)	5	53572 (30379)	244	23425 (38601)	54	71327 (60901)
Guatemala	5.1	40.4	-		-		327	34294 (62755)	141	61554 (88378)
Honduras	3.9	46.9	-		-		285	21235 (61564)	46	82289 (138620)
Mexico	7.6	74.4	-		-		2049	50174 (228685)	689	128414 (382572)
Nicaragua	7.0	64.7	-		-		151	33847 (79242)	61	65866 (117904)
Panama	11.1	57.7	-		-		72	39354 (92250)	20	111664 (155245)
Paraguay	14.1	56.0	-		-		217	23740 (45541)	47	72851 (80402)
Peru	5.0	72.8	-		-		195	133843 (508984)	162	158037 (555587)
Uruguay	28.7	91.3	19	54878 (63493)	17	59216 (65916)	19	170579 (295890)	19	170579 (295890)
Venezuela	3.6	87.4	-				322	71549 (188929)	179	116782 (244356)
Latin America			2244	25831 (61622)	730	53396 (102350)	11305	44463 (213113)	3528	119283 (370595)
United States	45.6	79.2	-		160	123243 (322758)	-		1066	97697 (289637)

Sources: Urbanization for circa *1910-1914 is defined as proportion of population living in major cities; in 2000, as proportion living in urban areas by various national definitions: see Bulmer-Thomas (2003, 7, 85)

Table 3

Log of Population on Capital City Status for Pooled Latin America: 1900 and 1990

	1900				1990 (1900 sample)				1990			
	2,500+		25,000+		2,500+		25,000+		2,500+		25,000+	
National Capital	**2.69*****	**2.81*****	**1.83*****	**2.05*****	**2.67*****	**2.71*****	**2.05*****	**2.06*****	**2.78*****	**2.74*****	**2.32*****	**2.29*****
	(0.60)	(0.50)	(0.56)	(0.43)	(0.64)	(0.48)	(0.52)	(0.42)	(0.34)	(0.32)	(0.29)	(0.27)
Provincial Capital	**0.82*****	**1.14*****	**0.53*****	**0.75*****	**2.72*****	**2.32*****	**1.51*****	**1.48*****	**2.14*****	**1.93*****	**1.20*****	**1.22*****
	(0.13)	(0.11)	(0.11)	(0.12)	(0.12)	(0.13)	(0.12)	(0.11)	(0.07)	(0.07)	(0.07)	(0.07)
Ex. National Capital	-	-	-	-	-	3.03***	-	3.16***	-	3.58***	-	3.32***
						(0.20)		(0.20)		(0.13)		(0.13)
ln(landarea)	0.14***	0.11***	0.01	0.05***	0.18***	0.13***	-0.04***	-0.06***	0.19***	0.18***	-0.006	-0.03***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.009)	(0.01)
Latitude	-	0.02***	-	0.02***	-	0.02***	-	0.02***	-	-0.005**	-	0.010***
		(0.00)		(0.01)		(0.003)		(0.004)		(0.002)		(0.002)
Longitude	-	-0.02***	-	-0.02***	-	-0.001	-	-0.012***	-	0.003***	-	-0.004***
		(0.00)		(0.00)		(0.001)		(0.001)		(0.001)		(0.001)
Altitude	-	-0.00***	-	-0.00	-	-0.00***	-	-0.00	-	-0.00*	-	-0.00
		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)
Coastline dummy	-	0.16**	-	0.11	-	0.72***	-	0.19**	-	0.77***	-	0.21***
		(0.07)		(0.11)		(0.09)		(0.09)		(0.07)		(0.07)
Coast line perimeter (0-1)	-	-0.49**	-	0.06	-	-0.24	-	-0.42	-	-0.43**	-	-0.25
		(0.21)		(0.37)		(0.27)		(0.28)		(0.21)		(0.21)
River dummy	-	0.05	-	0.01	-	0.31***	-	0.17***	-	0.07***	-	-0.01
		(0.04)		(0.04)		(0.04)		(0.04)		(0.02)		(0.03)
Summer avg. temperature	-	-0.04***	-	0.01	-	0.03***	-	-0.02	-	-0.007	-	0.008
		(0.01)		(0.01)		(0.01)		(0.01)		(0.006)		(0.007)
Winter avg. temperature	-	0.04***	-	0.01	-	-0.02***	-	0.00	-	-0.011**	-	-0.02***
		(0.01)		(0.01)		(0.006)		(0.00)		(0.004)		(0.005)
Average annual temperature	-	-0.04***	-	-0.00	-	0.04***	-	0.01	-	0.002	-	0.007
		(0.01)		(0.01)		(0.008)		(0.01)		(0.005)		(0.007)
Average annual precipitation	-	0.00***	-	0.00	-	0.00	-	-0.00***	-	-0.000***	-	-0.000***
		(0.00)		(0.00)		(0.00)		(0.00)		(0.000)		(0.000)
R^2	0.15	0.42	0.24	0.31	0.16	0.22	0.21	0.29	0.20	0.24	0.22	0.27
Number of Observations	2232	2222	728	726	6309	6307	1767	1767	11300	11286	3528	3525
F-test	-	117.90	-	3.67	-	44.23	-	16.59	-	68.25	-	20.15

Notes: Robust standard errors are shown in parethesis. The F-test tests the joint significance of the controls included in the regression.
*Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level.

Table 4

Log of Population on Capital City Status for United States: 1900 and 1990

United States	1900		1990 (1900 sample)		1990	
	25,000+		25,000+		25,000+	
National Capital	**0.53*** **	**0.52** **	**1.15*****	**0.80*****	**1.78*****	**1.82*****
	(0.18)	(0.26)	(0.10)	(0.23)	(0.05)	(0.05)
State Capital	**0.14**	**0.26****	**0.10**	**0.20***	**0.35*****	**0.37*****
	(0.13)	(0.11)	(0.14)	(0.11)	(0.11)	(0.11)
ln(landarea)	0.58***	0.58***	0.66***	0.72***	0.52***	0.48***
	(0.08)	(0.08)	(0.07)	(0.09)	(0.03)	(0.03)
Latitude	-	0.02	-	0.11*	-	0.02***
		(0.04)		(0.06)		(0.01)
Longitude	-	-0.02***	-	-0.03***	-	-0.01***
		(0.01)		(0.01)		(0.00)
Port dummy	-	0.50***	-	0.44***	-	0.71***
		(0.14)		(0.15)		(0.09)
River dummy	-	0.21**	-	-0.03	-	0.22***
		(0.10)		(0.10)		(0.06)
Precipitation (annual avg)	-	-0.00	-	-0.00***	-	-0.00***
		(0.00)		(0.00)		(0.00)
Temperature (annual avg)	-	0.06	-	0.16**	-	0.03***
		(0.05)		(0.08)		(0.01)
R^2	0.44	0.54	0.59	0.69	0.46	0.54
Number of Observations	160	160	157	157	1066	1066
F-test	557	217	531	284	8875	3632

Notes: Robust standard errors are shown in parethesis. The F-test tests the joint significance of the controls included in the regression.
*Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level.

Table 5

Log of Population on Capital City Status by Country in Latin America: 1900 and 1990

Country		1900				1990			
		2500+		25000+		2500+		25000+	
		(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Argentina	National Capital	4.95***	4.52***	3.54***	3.42***	3.93***	3.82***	3.17***	3.56***
	Provincial Capital	0.59**	0.69***	0.49**	0.65***	2.02***	2.05***	1.10***	1.17***
	R^2	0.11	0.32	0.56	0.66	0.25	0.35	0.35	0.41
	Number of Observations	365	365	73	73	489	489	245	245
	F-test	-							
Bolivia	National Capital					1.11	0.58	1.12	1.14
	Provincial Capital					1.97***	2.20***	1.35***	1.43***
	R^2					0.31	0.51	0.45	0.51
	Number of Observations					109	106	68	67
	F-test								
Brazil	National Capital	4.48***	4.85***	3.81***	3.94***	0.89***	1.87***	1.39***	1.30***
	Provincial Capital	1.72***	1.89***	1.14***	1.30***	3.89***	3.46***	2.54***	2.46***
	R^2	0.13	0.30	0.30	0.36	0.13	0.23	0.23	0.28
	Number of Observations	1469	1459	566	564	5269	5267	1222	1222
	F-test	-							
Chile	National Capital	2.20***	2.00***	2.05***	1.97***	2.35***	2.12***	2.33***	2.00***
	Provincial Capital	0.62***	0.60***	0.38***	0.41***	1.51***	1.44***	0.95***	1.13***
	R^2	0.39	0.52	0.45	0.55	0.33	0.75	0.46	0.70
	Number of Observations	79	79	50	50	52	52	44	44
	F-test	-							
Colombia	National Capital					3.50***	3.34***	3.31***	3.03***
	Provincial Capital					2.49***	2.64***	1.73***	1.87***
	R^2					0.26	0.42	0.46	0.50
	Number of Observations					1052	1051	251	251
	F-test								
Costa Rica	National Capital	1.10***	1.08***			1.07***	1.19***	1.01***	0.95***
	Provincial Capital	0.94**	0.96***			1.31***	1.11***	0.80***	0.77***
	R^2	0.66	0.80			0.25	0.41	0.37	0.61
	Number of Observations	29	29			81	81	49	49
	F-test	-							

Notes: The F-test tests the joint significance of the controls included in the regression. *Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level.

Table 5 - continued

Log of Population on Capital City Status by Country in Latin America: 1900 and 1990

Country		1900				1990			
		2500+		25000+		2500+		25000+	
Cuba	National Capital	2.23***	2.11***	1.96***	1.45	2.28***	2.33***	2.28***	2.36***
	Provincial Capital	1.42***	1.49***	0.40***	0.77	1.70***	1.71***	1.56***	1.55***
	R^2	0.42	0.47	0.63	0.96	0.60	0.62	0.71	0.73
	Number of Observations	120	120	16	16	155	155	134	134
	F-test								
Equador	National Capital					2.78***	3.19***	2.66***	2.73***
	Provincial Capital					1.54***	1.47***	1.04***	1.15***
	R^2					0.29	0.50	0.42	0.53
	Number of Observations					214	212	97	96
	F-test					-			
El Salvador	National Capital	1.84***	1.67***			1.90***	1.45***	1.45***	1.20***
	Provincial Capital	1.11***	1.02***			1.31***	1.11***	0.40*	0.42**
	R^2	0.52	0.67			0.31	0.54	0.21	0.44
	Number of Observations	151	151			244	244	54	54
	F-test	-							
Guatemala	National Capital					2.79***	2.53***	2.63***	2.34***
	Provincial Capital					0.89***	0.84***	0.45***	0.46***
	R^2					0.41	0.50	0.30	0.43
	Number of Observations					327	327	141	141
	F-test					-			
Honduras	National Capital					2.49***	2.48***	2.30***	2.19***
	Provincial Capital					0.87***	0.70***	0.31	0.36
	R^2					0.53	0.73	0.47	0.65
	Number of Observations					284	284	46	46
	F-test								
Mexico	National Capital					5.86***	5.52***	4.95***	5.09***
	Provincial Capital					2.94***	2.88***	1.97***	1.94***
	R^2					0.22	0.32	0.25	0.31
	Number of Observations					2049	2049	689	689
	F-test					-			

Notes: The F-test tests the joint significance of the controls included in the regression. *Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level.

Table 5 - continued

Log of Population on Capital City Status by Country in Latin America: 1900 and 1990

Country		1900		1990			
		2500+	25000+	2500+		25000+	
Nicaragua	National Capital			2.87***	2.01***	2.69***	2.06***
	Provincial Capital			1.21***	1.13***	0.57***	0.60***
	R^2			0.51	0.64	0.59	0.70
	Number of Observations			151	151	61	61
	F-test			-			
Panama	National Capital			2.80***	2.34***	2.46***	1.88***
	Provincial Capital			0.89***	0.81*	0.25	0.80**
	R^2			0.28	0.49	0.52	0.90
	Number of Observations			72	72	20	20
	F-test			-	-		
Paraguay	National Capital			3.76***	3.93***	2.25***	2.30***
	Provincial Capital			1.25***	1.30***	0.34	0.57**
	R^2			0.17	0.34	0.34	0.52
	Number of Observations			217	214	47	47
	F-test			-			
Peru	National Capital			3.44***	2.97***	3.40***	3.03***
	Provincial Capital			1.58***	1.52***	1.30***	1.28***
	R^2			0.39	0.55	0.48	0.57
	Number of Observations			195	193	162	161
	F-test			-			
Uruguay	National Capital	2.12**	3.44**	1.71	3.61*	1.71	3.61*
	Provincial Capital	-	-	-	-	-	-
	R^2	0.62	0.87	0.57	0.85	0.57	0.85
	Number of Observations	19	19	19	19	19	19
	F-test	-	-	-		-	
Venezuela	National Capital			2.66***	2.49***	2.54***	2.38***
	Provincial Capital			1.89***	1.90***	1.34***	1.41***
	R^2			0.27	0.35	0.38	0.45
	Number of Observations			321	320	179	179
	F-test			-			

Notes: The F-test tests the joint significance of the controls included in the regression. *Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level.

Table 6

Rank Order of National and Provincial/State Capital Coefficients, 1900 and 1990

1900	N. Capital (≥ 2,500)	P. Capital (≥ 2,500)		N. Capital (≥ 25,000)		P. Capital (≥ 25,000)	
Argentina	4.95	Brazil	1.72	Brazil	3.81	Brazil	1.14
Brazil	4.48	Cuba	1.42	Argentina	3.54	Argentina	0.49
Cuba	2.23	El Salvador	1.11	Chile	2.05	Cuba	0.40
Chile	2.20	Costa Rica	0.94	Cuba	1.96	Chile	0.38
Uruguay	2.12	Chile	0.62	**U.S.**	**0.53**	**U.S.**	**0.14**
El Salvador	1.84	Argentina	0.59				
Costa Rica	1.09						
1990	**N. Capital (≥ 2,500)**	**P. Capital (≥ 2,500)**		**N. Capital (≥ 25,000)**		**P. Capital (≥ 25,000)**	
Mexico	5.86	Brazil	3.89	Mexico	4.95	Brazil	2.54
Argentina	3.93	Mexico	2.94	Peru	3.40	Mexico	1.97
Paraguay	3.76	Colombia	2.49	Colombia	3.31	Colombia	1.73
Colombia	3.50	Argentina	2.02	Argentina	3.17	Cuba	1.56
Peru	3.44	Bolivia	1.97	Nicaragua	2.69	Bolivia	1.35
Nicaragua	2.87	Venezuela	1.89	Ecuador	2.66	Venezuela	1.34
Panama	2.80	Cuba	1.70	Guatemala	2.63	Peru	1.30
Guatemala	2.79	Peru	1.58	Venezuela	2.54	Argentina	1.10
Ecuador	2.78	Ecuador	1.54	Panama	2.46	Ecuador	1.04
Venezuela	2.66	Chile	1.51	Chile	2.33	Chile	0.95
Honduras	2.49	El Salvador	1.31	Honduras	2.30	Costa Rica	0.80
Chile	2.35	Costa Rica	1.31	Cuba	2.28	Nicaragua	0.57
Cuba	2.28	Paraguay	1.25	Paraguay	2.25	Guatemala	0.45
Brazil*	2.19	Nicaragua	1.21	Brazil*	2.24	El Salvador	0.40
El Salvador	1.90	Panama	0.89	**U.S.**	**1.78**	**U.S.**	**0.35**
Bolivia	1.11	Guatemala	0.89	El Salvador	1.45	Paraguay	0.34
Costa Rica	1.07	Honduras	0.87	Brazil	1.39	Honduras	0.31
Brazil	0.89			Bolivia	1.12	Panama	0.25
				Costa Rica	1.01		

Regression coefficient of the log of population on capital dummies with land area control;* Ex-national capital

Appendix.

A Simple Model of Political Centralization and Urban Primacy

In this section we propose a simple model of political centralization and population distribution. As in Ades and Glaeser (1995), we will divide each political region into two locations, the main city and the hinterland, and model the behavior of the local governments. However, and in line with our empirical strategy, a political region may not necessarily mean a country, but can also imply a province and its municipalities. Following Ennis, Pinto and Porto (2006), each agent has an endowment of one unit of labor that they supply inelastically, and derives utility from its net income (wage minus taxes). Each of the two locations produces the same homogeneous good with a Cobb-Douglass production function:

$$q_i = A_i L_i^{\alpha} G_i^{1-\alpha} \qquad \alpha \in (0,1) \quad i = M, H$$

where M implies mainland, H means hinterland, A_i is the productivity of each location, L_i is the population and G_i is the level of a public good that contributes to the production of the homogeneous good. Normalizing the output price, the profit maximizing condition determines the real wage level:

$$w_i = \alpha A_i \left(\frac{G_i}{L_i}\right)^{1-\alpha}$$

Note that the wage level is decreasing in population, reflecting the decreasing marginal returns of labor. This result can also encompass the congestion effect in Ades and Glaeser (1995). However, wages will be higher the more productive a region is and the more it invests in the public good.

Decentralization

In a decentralized scenario, the government in each location chooses the level of public good G_i and taxes the population with a uniform lump sum tax τ_i to finance this investment. The objective of the government is to maximize the net income $w_i - \tau_i$ and the budget constraint is given by $G_i = \tau_i L_i^{\beta}$, where parameter $\beta \in (0,1)$ reflects scale inefficiencies in revenue raising by the local powers. Given this, the local government problem can be stated as

$$\max_{\tau_i} \; \alpha A_i \left(\frac{G_i}{L_i}\right)^{1-\alpha} - \tau_i$$

$$s.t.\; G_i = \tau_i L_i^{\beta}$$

which gives a maximized objective function for the two locations:

$$w_i^*(A_i, L_i) = \left[\alpha^{1+\alpha}(1-\alpha)^{1-\alpha} A_i L_i^{(\beta-1)(1-\alpha)}\right]^{\frac{1}{\alpha}}$$

We will assume costless migration between locations, which implies that in equilibrium net income in both locations will be equalized:

$$w_M^*(A_M, L_M) = w_H^*(A_H, L_H)$$

This gives a relation between L_M and L_H:

$$\frac{L_M}{L_H} = \left(\frac{A_M}{A_H}\right)^{\frac{1}{(1-\alpha)(1-\beta)}} \qquad (1)$$

And the condition $L_M + L_H = L$ closes the model.

As a secondary result, we get that the tax level in both locations will be the same:

$$\tau_i^* = \left\{ \alpha(1-\alpha) \left[\frac{A_M^{\frac{1}{(1-\alpha)(1-\beta)}} + A_H^{\frac{1}{(1-\alpha)(1-\beta)}}}{L} \right]^{(1-\alpha)(1-\beta)} \right\}^{\frac{1}{\alpha}}$$

This means that the level of public goods in the more populated location will be higher and that wage levels will be equalized in both locations. Thus, the distribution of population will serve to compensate productivity differences between areas. As we can see in (1), the population distribution will be given by the relative productivity differences between both locations. In a decentralized scenario, the mainland will be more populated only if it is more productive than the hinterland.

Centralization

In the centralized case, there is one central government which rules on both locations and has the power to excise taxes and decide on the level of expenditure on public goods. We will simplify this twofold decision of tax and expenditure level on both locations by assuming that the central government chooses the same tax level in both locations but can provide different quantities of the public good. Thus, total revenue will be given by $G_M + G_H = \tau L^\beta$ and we will define $\theta = \frac{G_M}{G_M + G_H}$ as the share of expenditure of the public good in the mainland. The central government problem will be:

$$\max_{\theta,\tau} \gamma\left(\alpha A_M \left(\frac{G_M}{L_M}\right)^{1-\alpha} - \tau\right) + (1-\gamma)\left(\alpha A_H \left(\frac{G_H}{L_H}\right)^{1-\alpha} - \tau\right)$$

$$s.t. \quad G_M = \theta\tau L^\beta, G_H = (1-\theta)\tau L^\beta$$

where parameter $\gamma \in (0,1)$ represents the level of political centralization in the region. A larger γ will imply that the mainland has more political power and is therefore more relevant in the political considerations of the central government.

The maximizing condition for θ is independent of the tax level:

$$\frac{\theta^*}{1-\theta^*} = \left[\frac{A_M}{A_H}\frac{\gamma}{1-\gamma}\left(\frac{L_H}{L_M}\right)^{1-\alpha}\right]^{\frac{1}{\alpha}} \tag{2}$$

The costless migration assumption implies in this case that:

$$\alpha A_M \left(\frac{G_M}{L_M}\right)^{1-\alpha} - \tau = \alpha A_H \left(\frac{G_H}{L_H}\right)^{1-\alpha} - \tau$$

And using $G_M = \theta\tau L^\beta$, $G_H = (1-\theta)\tau L^\beta$ gives

$$\frac{L_M}{L_H} = \left(\frac{A_M}{A_H}\right)^{\frac{1}{(1-\alpha)}}\frac{\theta}{1-\theta} \tag{3}$$

Using (2) and (3) we arrive at $\theta^* = \gamma$ and

$$\frac{L_M}{L_H} = \left(\frac{A_M}{A_H}\right)^{\frac{1}{(1-\alpha)}}\frac{\gamma}{1-\gamma} \tag{4}$$

The model is closed with the condition $L_M + L_H = L$.

The tax rate is given by

$$\tau^* = \left\{\frac{\alpha(1-\alpha)}{L^{(1-\alpha)(1-\beta)}}\left[\gamma A_M^{\frac{1}{(1-\alpha)}} + (1-\gamma)A_H^{\frac{1}{(1-\alpha)}}\right]^{(1-\alpha)}\right\}^{\frac{1}{\alpha}}$$

which can easily be shown to be smaller than τ_i^*, the tax rate in the decentralized case. With a central government, there is no competition among political authorities between localities and as a result there is a lower provision of public goods: $\tau^* L^\beta < \tau_M^* L_M^\beta + \tau_H^* L_H^\beta$.

The main result is equation (4), which shows that the population distribution in the centralized case is given by productivity differences and also by the level of political centralization. Urban concentration will be higher the larger is γ. However, the model does not predict that a centralized structure will always imply a larger degree of urban concentration. If

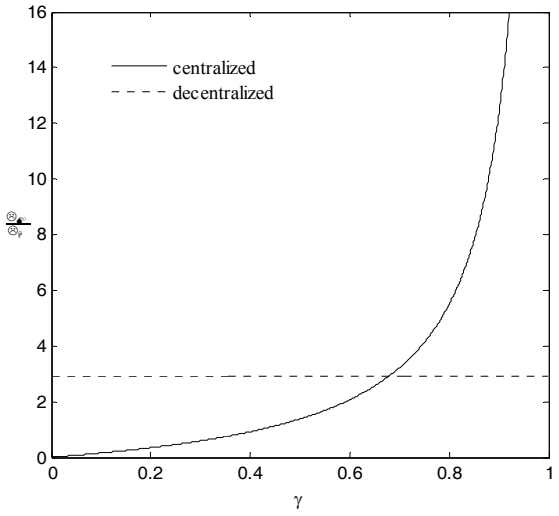
the central authority assigns a sufficiently balanced weight to the welfare of both localities, urban primacy will be lower in the centralized scenario.[11] Comparing (4) with (1), we show that urban concentration will be higher if and only if γ exceeds a certain threshold:

$$\gamma > \frac{A_M^{\frac{\beta}{(1-\beta)(1-\alpha)}}}{A_M^{\frac{\beta}{(1-\beta)(1-\alpha)}} + A_H^{\frac{\beta}{(1-\beta)(1-\alpha)}}}$$

The results of the model are illustrated in Figure 1.

Figure 1.

Population ratios



Notes: $\alpha = 0.3, \beta = 0.7, A_M = 3, A_H = 4, L = 100.$

11 As an example, take $\gamma = \frac{1}{2}$.