# Romes without Empires: Urban Concentration, Political Competition, and Economic Growth*

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**Abstract**

Many developing economies are characterized by the dominance of a super metropolis. Taking historical Rome as the archetype of a city that centralizes political power to extract resources from the rest of the country, we develop two models of rent-seeking and expropriation which illustrate different mechanisms that relate political competition to economic outcomes. The "voice" model shows that rent-seeking by different interest groups (localized in different specialized cities/regions) will lead to low investment and growth when the number of such groups is small. The "exit" model allows political competition among those with political power (to tax or expropriate from citizens) over a footloose tax base. It shows that when this power is centralized in relatively few urban nodes, tax rates would be higher and growth rates lower. Our empirical work exploits the connection between urban wealth (with the political power it affords) and national soccer championships. By using a cross-country data set for 103 countries for the period 1960-99, we find strong and robust evidence that countries with higher concentrations in urban wealth–as proxied by the number of different cities with championships in national soccer leagues–tend to have lower long-run growth rates.

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# 1 Introduction

At its zenith around the second century A.D., Rome had become by far the largest city in the world with a population well in excess of 800,000. Roman law had, quite early on (123 B.C.), entitled each citizen to receive a certain quantity of wheat at a fixed price. By 58 B.C. a succession of amendments to the law had reduced this price to zero. By 45 B.C. no fewer than 320,000 Romans received a free daily ration of bread that varied from 1 to 1.5 kilograms (yielding calories that would exceed the daily needs of an average adult).[1] Though, it has been estimated that by this time between 30 to 40 percent of the residents of Rome were either unemployed or underemployed, "[t]he state distribution of bread never bore, and would never bear, the least resemblance to assistance. Nothing indicates that the poorest citizens were given preference;...everything points to the reverse."[2] Rome used its military and political might to suppress potential competitors to its rule and to extract resources from its empire. The result was that "the parasitic character of the Roman metropolis was not only responsible for a weakening of the Italian economy; it also played a central part in...the collapse of the empire."[3]

The parallels between the remarkably extreme concentration of urban population and political power in the Roman Empire, and similar patterns observed in the developing countries of the modern world have led Bairoch (1988) to label such modern cities "Romes without empires".

Such concentrations were a long time in the making. Around 1930, when developing market economies had an average level of urbanization of 12.6%, 16% of their urban population lived in fourteen large cities (cities that had populations of more than half a million). Such a high concentration of urban population in large cities of the developed world had been attained in 1880, when its average level of urbanization stood much higher at 23%. The number of large cities in the developing world as well as their share of the total urban population increased radically between 1930 and 1980, by which date they had 43% of the urban population, a number which paralleled that of the developed countries. However, the level of urbanization in the latter stood at 65% whereas developing market economies had an urbanization level half of that.[4]

High levels of urban concentration in the developing world typically had their origins when a few cities started out as major outlets for the export of products from their

[1] See Bairoch (1988, p. 81).
[2] Veyne (1976) cited in ibid. p.84.
[3] ibid. p. 105.
[4] For these numbers, see Bairoch (1988).

hinterlands and became centers of colonial or post-colonial administration, benefiting from a "lack of effective competition from provincial centers".[5] Thus, in colonial Spanish America a tiny number of ports (one in Spain and three in America) monopolized trade and prevented the formation of a dense commercial network, impeding the genesis of a system of specialization and exchange across the colonies. In contrast, British North America developed hundreds of ports and surrounding hinterland economies, letting them compete against each other.[6] This contrast is symptomatic of the structural differences that led the two regions along divergent political and economic paths. North et al. (2000) argue that centralization of political power that results in an authoritarian establishment of order typically leads governments to transgress the rights of the citizens. The lack of well-defined rights implies that more resources have to be devoted by agents to protect themselves from the state reducing the amount of resources allocated to productive activities. By decreasing the threat of unilateral expropriation of property, a more polycentric distribution of political power, on the other hand, would lead to more secure property rights and a larger share of resources allocated to productive activities.

The connections between the security of property rights, the distribution of political power and cities have long been recognized. In the *Wealth of Nations*, Adam Smith emphasized the importance of "the liberty and security of individuals," noting that it was because of this security in the cities that industry flourished and "stock accumulated" there before the country. Smith argued that cities in France and England were given their freedom as a consequence of the political competition between the sovereign and feudal lords. As he put it "[t]he burghers naturally hated and feared the lords. The king hated and feared them too; but though perhaps he might despise, he had no reason either to hate or fear the burghers. Mutual interest, therefore, disposed them to support the king, and the king to support them against the lords. They were the enemies of his enemies, and it was his interest to render them as secure and independent of those enemies as he could" (Smith 2000, p. 430). It was also the direct pressure put on princes by alliances of cities such as the Hanseatic League, Greif et al. (1994) argue, that led to more secure property rights and, therefore, to the medieval expansion of trade. A related argument is put forward by Weingast (1995), who points to the role played by decentralization ("federalism") in the economic development and growth of "Netherlands from the late 16th through mid-17th century, England from the late 17th or early 18th through the mid-19th century, and the United States from the late

[5]Clark (1996) and Balchin et al. (2000).

[6]North, Summerhill and Weingast (2000).

19th century until the late 20th century." An important reason why the industrial revolution could make headway in England was that when regulations in the established urban centers threatened to choke off the fledgling industrial activity, local justices in the north, who had their own political authority and, thus, regulatory power, competed to attract new forms of economic activity to their jurisdictions. This pattern, which would have been impossible in an economy where all fiscal and regulatory power had been centralized, was eventually repeated elsewhere in Europe which saw the rise of a large number of new towns and cities that came to represent the new industrial interests as opposed to the established centers[7]. In Asia it was in the second half of the nineteenth century that a number of port cities of the agrarian empires were able to break free of the centralized authorities. International agreements imposed upon these authorities by the colonial powers established judicial systems that dramatically improved security of property rights and led to an unprecedented economic expansion.[8] In the same vein, the recent economic renaissance of China followed the establishment of a decentralized fiscal system. Montinola, Qian, and Weingast (1996) argue that it is this decentralization that ensured the success of the Chinese reforms of 1979-1993. By establishing alternative centers of power, argue Montinola et al., decentralization generated forces that successfully resisted later attempts by the central government to compromise the reforms and led to the continuation of China's spectacular growth. Explaining the policies followed by states in tropical Africa after independence, Bates (1981) emphasizes that the widespread adoption of policies that transferred resources from agriculture to infant industries was a consequence of the lack of political power of geographically dispersed agricultural interests. Urban groups, on the other hand, were able to wield their political power much more effectively by virtue of their geographical concentration. As we argue below in the case studies section, this line of reasoning helps explain the differences in economic performance of many countries outside Africa as well.

The connection between urban concentration and the level of economic development has been the subject of a large literature, starting with the seminal paper of Williamson (1965) which put forward the hypothesis that one should expect a non-monotonic relation between the two. At early stages of development, Williamson supposed high urban concentration to be helpful by conserving expenditure on infrastructure and by enhancing information spillovers at a point when the economy suffers from a severe scarcity

[7]See Bairoch (1988). De Vries (1984) shows that during early industrialization in Europe the slope of the rank-size distributions became flatter, indicating a movement towards polycentrism.

[8]See Basu (1985), Broeze (1989), and Keyder et al. (1993).

of infrastructure and information.[9] With the development of the economy, it becomes possible to spread the infrastructure and information into the hinterland, while rising costs in congested urban areas push producers and consumers out of these erstwhile centers. This pattern of income growth, resulting initially in higher and later in lower urban concentration, is supported by a number of empirical studies (El-Shaks 1972; Alonso 1980; Rosen and Resnick 1980; Wheaton and Shishido 1981; Mutlu 1989; Ades and Glaeser 1995; Junius 1999; Davis and Henderson 2003; and Moomaw and Alwosabi 2004). A more recent strand of literature focuses on political factors to explain high urban concentration (Henderson 1988; Ades and Glaeser 1995; Henderson and Becker 2000; Davis and Henderson 2003). Here the mechanism emphasized is that of a national government favoring a capital or central city in terms of investment, granting of loans, licences, etc. at the expense of the hinterland. This, it is argued, allows the bureaucrats in the center to compete more effectively in the extraction of rents against low-ranking rivals in the provinces.

The question, however, of the implications of high urban concentration for economic outcomes remains largely unexamined. The glaring exception is the recent paper by Henderson (2003) that formulates the question as the "so what" of urban concentration and studies the quantitative effects of both urbanization and urban concentration on productivity growth. Henderson finds evidence that there is a level of urban concentration that maximizes productivity growth and that this level depends on the development and the size of the economy.[10]

Our paper differs from the existing literature in the area in a number of respects. First, unlike others, it focuses on the political economy mechanisms that causally link urban concentration to economic growth. The argument we advance formally is that urban concentration, by effectively centralizing political and economic power[11] at the expense of potential competitors that could have arisen elsewhere, has deleterious effects on the rate of growth of the economy in question. Several political economy mechanisms may account for the suggested negative effects of centralization. Our paper formalizes two of these which could be called the "voice" and "exit" mechanisms. The first one supposes

[9]Davis and Henderson (2003) compiles these microfoundations from various sources: labor market matching, outsourcing and local intra-industry specialization and local diversity in non-traded intermediate goods.

[10]Gallup et al. (1999) imply that urbanization may promote growth. Henderson (2003) finds no evidence for this hypothesis.

[11]On the connection between wealth and political power, see Acemoglu, Johnson, and Robinson (2005).

that, with division of labor and specialization, different urban centers become nodes of different and potentially competing interests.[12] To the extent that the political institutions allow for, and respond to, active rent-seeking by these interests, agents will not restrict themselves to purely economic activities, but engage in rent-seeking and try to redistribute income to themselves through political channels. The "voice" model (a version of the celebrated Grossman and Helpman (1994) lobbying setup) that formalizes such activity, shows that as long as political competition remains limited, those organized groups that expend resources in rent-seeking succeed in redistributing income to themselves. However, a rise in the number of interests that engage in such political competition, reduces and eventually eliminates such redistribution. Insofar as redistribution leads to deadweight losses, its elimination would have beneficial consequences for economic development. The second mechanism is formalized in an "exit" model which starts with the argument that competition among rulers of political centers with some ability to conduct independent economic policy (such as cities that are administrative centers of regions within a country) might promote economic growth.[13] An environment that could give rise to such an outcome is one where footloose agents find it possible to move to those jurisdictions/cities where rulers offer policies that are more conducive to the economic welfare of these agents. The "exit" model indeed shows that centralization of power leads to higher expropriation rates and lower levels of "public services", whereas political competition for mobile "resources" improves outcomes significantly, leading to higher long-run growth rates.

The role of political competition in promoting the adoption of more efficient policies, in general, has been noted in different contexts. Grossman and Helpman (1994) and Mitra (1999), for instance, show that the higher the number of lobbies involved the smaller the tariff subsidies awarded.[14] Acemoglu, Johnson, and Robinson (2005) point out that concentration of political power in the hands of an elite implies that the majority

[12]Henderson (1988) and Lee (1997) find that for Brazil, US, Korea, and India cities are relatively specialized. Using 1990 data for the US, Black and Henderson (2003) show that production patterns across different city types are statistically different and that specialization, especially among smaller cities, tends to be absolute. Kim (1995) examines how patterns of specialization in the US have changed over time. He finds that states are substantially less specialized in 1987 than in 1860, but that localization, or concentration has increased over time. For Korea, Henderson, Lee, and Lee (2001) find that from 1983 to 1993, city specialization, as measured by a normalized Hirschman-Herfindahl index, rises in manufacturing, while a provincial level index declines.

[13]Karayalcin (2008) uses this setup in comparing the historical records of the agrarian empires of the East with that of the European states system.

[14]See also Persson and Tabellini (2000, ch. 7).

of the population risks being *held up* by the elite after they undertake investments. This lack of secure property rights would then discourage investment and economic growth. Weingast (1995) argues that the crucial factor that generated economic expansion in both cases was political competition among jurisdictions (which he labels "market-preserving federalism") for the mobile capital and labor because this competition limited the ability of the state to confiscate wealth.[15] Epple and Romer (1991) present a static closed-economy model where exit, that is the mobility of factors (a la Tiebout, 1956) subject to taxation, limits the extent of redistribution. Optimal taxation when the tax base is mobile internationally has been studied extensively in the literature (see Persson and Tabellini 1995 for a survey.) Recent common property models of growth (see, for example, Benhabib and Rustichini 1996; Lane and Tornell 1996) focus on the negative effects of conflict among social groups on growth as they attempt to expropriate resources from each other. In Grossman and Kim (1996) agents adopt a "voice" strategy, namely, arming themselves to the teeth against potential predators/expropriators.[16] Another historically important alternative strategy is insurrection or revolt that, if successful, results in the overthrow of the rulers by their subjects (see Grossman 1991). Thus, Acemoglu and Robinson (2000) argue cogently that the extension of the franchise in the West was a response to the threat of revolution. Democracy was necessary because the only safeguard for the sustained redistribution desired by the masses was possession of political power. This link between political power and the redistribution of wealth it affords those who happen to command such power has been used in a number of different contexts. Acemoglu and Robinson (2006) exploit this link to argue that political elites may block technological and institutional developments for fear that they would lead to loss of political power, which would then translate into an economic loss. Alesina and Rodrik (1994), among others, point out that in majoritarian democracies, which give the median voter the decisive political power, this power could be used to redistribute wealth. To the extent that such redistribution has to be carried out by distortionary taxation, this would lower the rate of growth of the economy.

The other major area where we differ from the existing literature is in the empirical

[15]Weingast (1995) Montinola, Qian, and Weingast (1996) also point out the fundamental role played by "federalism" in the remarkable growth performance of China over the past two decades. North, Summerhill, and Weingast (2000), and Nugent and Robinson (2001) emphasize the importance of political competition for the growth performance of a number of Latin American countries.

[16]In their empirical investigation of the importance of institutions, Acemoglu and Johnson (2003) find that institutions which protect citizens against expropriation have a first order effect on long-run economic growth.

section of the paper. This section takes the central hypothesis of the theoretical part of the paper, namely, that higher urban concentration reflects the centralization of economic wealth and political power and would, ceteris paribus, lower the rate of income growth. In the existing literature data considerations have forced researchers to adopt one of the three following measures of urban concentration. The first measure used is the standard Hirschman-Herfindahl index applied to an urban context using urban population data (see Wheaton and Shishido 1981; and Henderson 1988). A second one (as in Rosen and Resnick 1980) is the Pareto parameter which measures how city sizes decline as we move downward along the relevant distribution. Both measures adopted in these papers are limited to just one year and cover only a restricted sample of mostly larger countries in the world. As they are not available for a larger group of countries for a longer period of time Henderson (2003) uses a third measure, namely urban primacy, which focuses on the share of the largest metropolitan area in the urban population. If this share is higher than 25%, urban primacy correlates highly with the previous two measures. In the data set used in Henderson (2003), the average primacy level turns out to be 0.31, and the measure used correlates well with the the previous two metrics. However, in the larger data set that we use, the average urban primacy level is only 0.14, with the consequence that the urban primacy measure fails to be a good proxy in our context.

Furthermore, the theoretical arguments we formulate are predicated on the use of a finer measure of urban concentration *closely linked to the geographic dispersion of political power*, and of wealth, within the country. So, the size of the metropolitan population typically used in the urban concentration literature, does not necessarily provide a fine metric of the distribution of resources or of wealth among cities and, thus, need not correlate well with the political power they wield in the national political arena. These considerations lead us to adopt an alternative measure: an index of the distribution of soccer championships across cities in a given economy, mimicking the geographic concentration of political influence and wealth. This index captures jointly the effects of voice and exit models. The economics of sports literature suggests that, as the world's most popular sport (as measured by spectators and the number of people playing), soccer produces successful teams largely in those urban centers that have relatively high economic potential. The traditional soccer team financing strategy, the so-called Spectators-Subsidies-Sponsors-Local (SSSL) model, remains by far the dominant one despite attempts by teams to switch to what is called a Media-Magnates-Merchandising-Markets-Global (MMMMG) structure. As recent empirical work (see,

inter alia, Frick and Prinz 2004) shows, there is a high correlation between success and the availability of local resources.[17] We exploit this fact and construct a Herfindahl index of the distribution of soccer championships across cities to proxy the geographical concentration of political power. Our "exit" model predicts that when political power is dispersed over jurisdictions (with their centers represented typically by cities), political competition among them for footloose productive agents that form their tax bases would lead to the adoption of more pro-growth policies.[18] Similarly, our "voice" model predicts that the more dispersed political power is across cities representing conflicting special interests, the stronger would be the political competition among them, resulting again in less distortionary, more pro-growth policies.[19]

It turns out that empirically the soccer data capture the mechanisms formalized remarkably well. Utilizing a cross-sectional data of 103 countries covering the 1960-1999 period, an instrumental variables estimation followed by a number of sensitivity checks finds strong and robust empirical support for the hypothesis that a lower degree of urban concentration is highly positively correlated with long-run development. In our instrumentation strategy, we use binary indicators of primate capital city and federalization, as well as a group of variables put forward by Acemoglu, Johnson and Robinson (2001, 2002) and Acemoglu, Johnson, Robinson and Yared (2008) that refer to the historical origins of institutional quality within countries, namely, log settler mortality, urbanization and log population density in 1500s, constraint on the executive at independence, and independence year. First-stage regressions indicate significant associations between the instrumental variables and the distribution of soccer championships in predicted directions, enabling us to capture both contemporary and historical effects regarding the politics of geographical concentration in the second stage. Regressions with growth rate of real GDP per capita, the latter being an alternative to the benchmark development measure log per capita income, suggest that countries with the highest and the lowest concentration scores in our sample - Paraguay and Germany, respectively, are typical representatives - display a difference of about 2% in their average annual growth rates over the period 1960-1999 due to economic and political centralization and its associ-

[17] See also Dobson and Goddard (2001).

[18] A typical example from the US would be the recent two-year competition of towns in more than 25 states to attract Toyota. In February 2007, Toyota announced that Tupelo, Mississippi beat its two closest rivals from Arkansas and Tennessee and would be the site of a new assembly plant.

[19] When, for example, US steel producers successfully lobbied for the imposition of a tariff on imported steel (which took effect on March 20, 2002), counter-lobbying by US automakers (as well as a ruling by the WTO) was instrumental for the lifting of the tariff on December 4, 2003.

ated effects. Given the enormous importance of such differences in growth rates for per capita GDP in the long run, it is hard to overstate their significance. In terms of robustness checks, among others, we draw insights from a panel dataset, explore the association across decennary cross-sections, and check the sensitivity of the results to the measurement of the soccer information.

The rest of the paper is organized as follows. Sections 2 and 3 present the models of "voice" and "exit" as versions of political competition. Section 4 discusses our empirical methodology and Section 5 the empirical findings. Section 6 presents the sensitivity analysis. We provide a number of short case studies in Section 7 while Section 8 concludes the paper.

# 2 Voice: Rent-seeking/Lobbying

The voice model presented here captures in a simple way the mechanism whereby limited political competition among self-interested parties would lead to distortions and dead-weight losses. Increased political competition, on the other hand, would lead to more secure property rights (in the sense of reduced expropriation/taxation from unorganized groups) and more investment. To the extent that one identifies different interests as being locally differentiated–as would be the case, for instance, in an economy where division of labor and specialization has advanced–this would imply that those countries that are more polycentric would have higher growth rates.

Consider now an economy populated by two types of agents: a ruler (government) and a large number of citizens whose mass is normalized to one. All agents live for two periods. There are $N$ groups of citizens in the economy, each representing a special interest localized in different cities/regions. Each group has mass $\lambda_i$ with $\sum \lambda_i = 1$. Some of the groups are organized into interest groups, others remain unorganized. Without loss of generality let $\Theta = \{1, .., n\}$ and $\Lambda = \{n+1, .., N\}$ be the sets of organized and unorganized groups. Each citizen in group $i$ maximizes lifetime utility $U_i$ given by

$$U_i = u(c_{1i}) + \beta u(c_{2i}), \tag{1}$$

subject to

$$c_{1i} = (1 - \tau_i)e_i - s_i, \quad c_{2i} = Rs_i \tag{2}$$

where $c_{ki}$ is consumption in period-$k$ ($k\epsilon\{1, 2\}$) of an agent in group $i$, $R$ is the gross rate of return, $e$ and $s$ denote endowment income and savings. The only policy instruments

available to the ruler are proportional tax/subsidy rates, the vector of which is denoted by $\tau = (\tau_1, ..., \tau_N)$ where $\tau_i > 0$ ($\tau_i < 0$) denotes a tax (subsidy) rate. Solution of a citizen's problem given in (1) and (2) yields the indirect utility

$$V_i = V(\tau_i), \quad V'(.) < 0. \tag{3}$$

Suppose, as in Grossman and Helpman (1994), that the ruler's utility function $U_R(\tau)$ takes the form

$$U_R(\tau) = \sum_{j \epsilon \Theta} C_j(\tau) + a\Omega(\tau) \tag{4}$$

where $C_j(\tau)$ is the contribution schedule of interest group $j$, $\Omega = \sum_{i=1}^{N} \lambda_i V_i$ is aggregate social welfare, and $a$ is the weight the ruler attaches to social welfare $\Omega$. If $a = 0$, the ruler cares only about the contributions he receives, while if $a \to \infty$ he behaves as a utilitarian social planner.

Suppose that the tax-cum-subsidy policy is purely redistributionary

$$\sum \lambda_i \tau_i e_i - T = 0 \tag{5}$$

where $T$ is the deadweight loss from taxation.

Rent-seeking by organized lobbies takes the following form: all groups organized into lobbies offer truthful contribution schedules

$$C_j(\tau) = \max[0, \lambda_j(V_j(\tau) - \omega_j)] \tag{6}$$

(where the scalars $\omega_i$ are to be determined in equilibrium) that reveal how much they are willing to pay for the implementation of the policy vector $\tau$. The ruler chooses $\tau$ after observing the offered contributions.

Focusing, as in Grossman and Helpman (1994), on equilibria where organized groups make positive contributions, (4) and (5) yield

$$\max U_R(\tau) = \sum_{j \epsilon \Theta} \lambda_j(V_j(\tau) - \omega_j) + a\Omega(\tau) \Rightarrow \max \sum_{j \epsilon \Theta} \lambda_j V_j(\tau) + a\Omega(\tau). \tag{7}$$

Thus,

$$\tau = \arg\max_{\tau} \left( \sum_{j \epsilon \Theta} \lambda_j V_j(\tau) + a \sum_{i \epsilon \Theta \cup \Lambda} \lambda_i V_i(\tau) \right), \tag{8}$$

that, is the policy vector chosen by the ruler is the one that maximizes a weighted social welfare function where the welfare of organized groups receives the weight $1+a$, whereas that of the unorganized groups receives a weight of only $a$. In other words, rent-seekers (groups that engage in lobbying here) obtain favorable treatment from the ruler in return for the resources transferred to him. Note also that (6) is a special form of the more general political support function of Hillman (1989) and provides micro foundations for this function.

To put the results into sharp focus, specialize now the period utility functions $u(c_{ki})$ to $u(c_{ki}) = \ln c_{ki}$, and let the deadweight loss be proportional to total (and given$\sum_i \lambda_i = 1$, average) income $e = \sum_{i\epsilon\Theta\cup\Lambda} \lambda_i e_i$, so that

$$T = \begin{cases} \sigma e > 0 \; if \; \exists i \text{ such that } \tau_i > 0, \\ 0 \; if \; \forall i \; \tau_i = 0. \end{cases} \tag{9}$$

(7) then yields the following expressions for the tax/subsidy rates for organized and unorganized groups

$$\tau_j = 1 - \frac{e}{e_j}\frac{(1+a)(1-\sigma)}{(\lambda_o + a)}, \quad j\epsilon\Theta \tag{10}$$

$$\tau_i = 1 - \frac{e}{e_i}\frac{a(1-\sigma)}{(\lambda_o + a)}, \quad i\epsilon\Lambda \tag{11}$$

where $\lambda_o\epsilon[0,1]$ denotes the mass of individuals organized in interest groups. These equations yield a number of results, the most important of which for our purposes are summarized by the following.

**Proposition 1** *Let, for simplicity, all individuals have the same endowment income so that $e_i = e$ for all $i\epsilon\Theta \cup \Lambda$. Then organized groups receive a subsidy and unorganized groups are taxed as long as the mass of individuals belonging to rent-seeking groups is less than a critical level $\tilde{\lambda}_o = 1-\sigma(1+a)$. Once the critical level is reached redistribution ends.*

**Proof.** This follows immediately from (8)-(11). ■

The proposition reflects the argument that interest groups typically engage in rent-seeking activities, attempting to redistribute income from the rest of the population to themselves. Such activity succeeds as long as it does not meet with effective opposition from groups that are adversely effected. Here, up to a point, contributions to the government buy organized groups a more favorable treatment from the government

(which assigns them a higher weight, $1 + a$, in the social welfare function) as compared to non-organized groups (which are assigned a lower weight). However, when resistance to predatory practices becomes more intense, that is, when more individuals are organized in groups with conflicting interests, political competition among them eventually eliminates such practices.

**Proposition 2** *Redistribution depresses aggregate investment and, thus, growth until political competition among interest groups reaches a critical level (expressed by the critical mass of organized groups in Proposition 1). Beyond that critical level investment and growth bounces to a higher level.*

**Proof.** First note that (1) and (2) yield $s_i = [\beta/(1+\beta)](1-\tau_i)e_i$. Thus, total savings $s$ is given by $s = [\beta/(1+\beta)] \sum_{i \epsilon \Theta \cup \Lambda} (1-\tau_i)\lambda_i e_i$. Substituting the ruler's budget constraint yields $s = [\beta/(1+\beta)](e-T)$. Once political competition among groups (as measured by the mass $\lambda_o$ of citizens engaged in organized rent-seeking activity) reaches the critical level $\tilde{\lambda}_o$ , the ruler stops redistributing income through taxes and subsidies, deadweight losses vanish and savings, investment, and, thus, growth rise to a higher level. ■

Thus, we have established that once it attains a certain critical level, increased political competition among interest groups leads to reduced taxation (expropriation), improving the security of property and, thus, leading to more investment and higher levels of growth.

# 3 Exit: Long-run growth under centralized and decentralized systems

We now turn to an analysis of long-run growth under centralized and decentralized systems. To do so we use a simple dynamic setup to illustrate the main points. An economy in this setup consists of two types of agents, rulers and citizens. Citizens produce a good that can be used for consumption and investment. Rulers appropriate a portion of the good produced and, in return, may choose to supply public services that enhance the productivity of the citizens. Rulers are identified with different cities/regions which we will label jurisdictions. We start by discussing the role and nature of these public services.

## 3.1 Productive "Public Services"

Each citizen $i$ in jurisdiction $j$ has access to a production technology summarized by $y_i^j = \alpha k_i^j f(G^j/Y^j), \quad f(0) = 0, f' > 0, f'' < 0$, where $y_i^j$ is the quantity of the composite good produced by the citizen $i$, $\alpha$ is a positive constant, $k_i^j$ is the stock of "capital" that the citizen has in his possession, $f$ is a function that depends on the total output of the jurisdiction $Y^j = \int y_i^j di$, and $G^j \geq 0$ denotes the amount of public good provided by the ruler of jurisdiction $j$. The formulation of the function $f(\cdot)$ reflects three considerations: (i) the higher the level of public services provided, the more productive each producer is; (ii) the provision of public services is essential for "social order" and for production so that if the ruler fails to provide such services no production can take place ($f(0) = 0$); and (iii) typically, the provision of public services such as security, adjudication, and infrastructure is subject to congestion, i.e., the public service is rival but not excludable.[20]

We now turn to the description of the problem faced by the citizens.

## 3.2 The citizens

Citizens are infinitely-lived dynastic families. Each family $i$ residing in jurisdiction $j$ chooses its consumption $c_i^j$ to maximize its lifetime welfare $U_i^j = \int_0^\infty u(c_{i,t}^j)e^{-\rho t}dt$ (with $u(c_{i,t}) = \frac{(c_{i,t}^j)^{1-\theta}-1}{1-\theta}$) subject to the budget constraint[21] $c_i^j + \dot{k}_i^j = (1-\tau^j)y_i^j$, where $\tau^j$ is the constant rate at which the ruler expropriates income. Henceforth, for simplicity, we shall call $\tau^j$ the tax rate with the understanding that this need not coincide with the legal tax rate (legitimized by whatever political mechanism that may exist).

A jurisdiction $j$ starts life with a continuum of citizens whose mass is $N^j$. The citizens may move from one jurisdiction to another, taking their capital with them, if doing so improves their welfare. Citizens who move incur a one-time migration cost $\xi \geq 0$.

## 3.3 The rulers

Each jurisdiction is ruled by one infinitely-lived ruler. Rulers derive utility from consumption. They also derive an additional benefit from ruling a jurisdiction with a

[20] Note that $G$ is a flow, so that the right interpretation say, for roads, would be total mileage per year, etc.

[21] In what follows we drop the time subscripts except where there is risk of confusion.

minimum number, $\bar{N} > 0$, of inhabitants. We suppose that this is the minimum number required, *inter alia*, to sustain, for instance, the jurisdiction and its ruler as independent entities. Formally, rulers maximize $U_r^j = \int_0^\infty u(c_{r,t}^j)e^{-\rho t}dt + \Omega(N^j)$ (with $\Omega(N^j) = \Delta > 0$ if $N^j \geq \bar{N} > 0$ and $\Omega(N^j) = 0$ if $N^j < \bar{N}$), where the subscript $r$ indicates a ruler and the function $\Omega(N^j)$ captures the additional benefits a ruler enjoys when the jurisdiction has at least $\bar{N}$ citizens.[22]

From citizens residing and producing in jurisdiction $j$ its ruler collects tax revenues, $\tau^j Y^j$ of which he uses a fraction $(1-\mu^j)$ to finance the provision of public goods; thus, $G^j = (1-\mu^j)\tau^j Y^j$. The rest is employed for the ruler's consumption; thus $c^j = \mu^j \tau^j Y^j$.

We now turn to the description of equilibrium, first in a centralized economy and, secondly, in a decentralized system of multiple jurisdictions forming an economy .

## 3.4 The centralized economy

A centralized economy for our purposes is an economy from which its inhabitants find it impossible to emigrate. Formally, a centralized economy is an economy where the migration cost $\xi \to \infty$. Thus, the ruler of such a centralized economy finds himself with a subject population on which taxes can be imposed without fear of losing at least some of them to a rival ruler. The problem that confronts such a ruler is to determine (1) the level of the proportional tax to be imposed upon his citizens, and (2) the fraction of the tax revenue that can be used to finance the ruler's consumption. An increase in the tax rate has two contradictory consequences. On the one hand, it reduces the rate of return on investment and, thus, lowers the rate of capital accumulation by his citizens. This depresses future output and future revenues that can be appropriated by the ruler. On the other hand, given the existing capital stock, a higher tax rate yields, ceteris paribus, more tax revenue, enabling the ruler to supply a higher quantity of the public good. This, in turn, increases both the output and the rate of return on investment.

Formally, to solve the problem confronting the ruler of the centralized economy, we start by describing the behavior of the citizens facing given $\tau$ and $\mu$ (thus, a given quantity of the public good relative to total output).[23] Citizens maximize their utility subject to their budget constraint, facing an after-tax rate of return on capital equal

[22]The only role this additional benefit plays in the analysis that follows is to ensure that a ruler that chooses the optimal tax and appropriation rates is never indifferent between that choice and that of adopting policies that lead to the loss of all citizens.

[23]In this section we drop the economy superscripts $j$ because we are concerned with a single centralized economy.

to $(1-\tau)\alpha f(G/Y)$. It is straightforward to show that given constant $\tau$ and $\mu$, the choices of the citizens yield growth rates for consumption, capital, and output all equal to the same constant $g = (1/\theta)\{(1-\tau)\alpha f[(1-\mu)\tau] - \rho\}$. Given our restrictions on the function $f(\cdot)$, this growth rate initially rises with the tax rate $\tau$ at low values and falls with it as $\tau$ keeps rising. The value of $\tau$ that maximizes the growth rate $g$ is implicitly given by $(1-\tau)(1-\mu)f'[(1-\mu)\tau] = f[(1-\mu)\tau]$. It is straightforward to show that the welfare of an individual citizen depends positively on the growth rate $g$.

Turning now to the problem faced by the ruler, we first observe that since his consumption is given by $c = \mu\tau Y$ it also grows at the common constant rate $g$ given time-invariant choices for $\tau$ and $\mu$. The first-order conditions of the ruler's problem can be shown to yield the following results.[24] First, the optimal tax rate for the ruler of the centralized economy is not the one that maximizes the growth rate. Since a citizen's lifetime welfare depends positively on the growth rate, this choice is then suboptimal for a given citizen. Second, given the relationship between the growth and tax rates discussed above, it is easy to see that the tax rate is higher than the one that would be chosen by a benevolent ruler that seeks to maximize the welfare of the citizens. However, the ruler follows the familiar condition for efficiency and chooses the level of $G$ such that the marginal benefit, $dY/dG$, of public services provided equals its marginal cost in terms of output foregone.

We now turn to the discussion of equilibrium in the case of a decentralized economy.

## 3.5 The decentralized economy

Consider now an environment where citizens and rulers find themselves distributed over a number of jurisdictions $j$ ($j \in \{1, 2, .., M\}$). Initially, each jurisdiction has $N^j \geq \bar{N}$ inhabitants and a ruler. Suppose that the cost of migration is low enough to allow movement of citizens across the jurisdictions; for simplicity, assume that this cost $\xi = 0$.

Citizens that can move around within this decentralized economy will choose to reside in the jurisdiction that offers them the highest level of lifetime welfare. Rulers will, therefore, have to compete to attract tax-paying citizens to ensure the continuing existence of a tax base and the viability of their jurisdictions and rule. What will be the equilibrium outcome of the interaction of the $M$ rulers and their citizens?

Given our bare-bones setup, the answer is straightforward and captures the essence of the centralized vs. decentralized economy argument. The Nash equilibrium of the

[24] See Karayalcin (2008).

game played among rulers is that each ruler will choose $\gamma = (\tau_m, \mu_m)$ which ensures the maximum growth rate. To see why, recall that the lifetime welfare of a citizen is maximized when the growth rate is at its maximum (see (17)). If other rulers do not adopt the combination $\gamma$, the ruler who does will be able to attract citizens of others to his jurisdiction, thereby receiving a payoff higher than he would otherwise get. If other rulers adopt $\gamma$, a ruler who does not, loses all his citizens and earns a payoff that is less than what he would earn had he adopted $\gamma$. Note also that the growth-rate-maximizing tax rate is implicitly given by $(1 - \tau_m)f'(\tau_m) = f(\tau_m)$ and that competition among rulers results in $\mu_m = 0$.

# 4 Empirical analysis

The models above provide testable implications. In this section, we conduct a cross-country empirical analysis to test the impact of geographical concentration of wealth on economic development. To proxy the geographical concentration of wealth, we use a Herfindahl measure on soccer championships in the first division leagues around the world. Concentration of political power in a small number of urban centers and the consequent lack of political competition would imply that soccer champion clubs would consistently originate from only a few cities. On the other hand, if urban wealth, hence the political power, is spread across the country, champion clubs would be located in a number of different cities. Thus, two central tools of the theoretical models, i.e., political competition and decentralization are well-captured by this variable. Our data set covers a cross-section of 103 countries observed over the 1960-1999 period. We analyze a number of dimensions of the data including using growth rates instead of levels of income, different samples, and different sets of instrumental variables.

## 4.1 Soccer Championship Data and Sample Selection

Soccer (or football) is the most popular sport in the world as measured both by the number of people attending soccer games[25] and the number of viewers (counted in billions) who watch the game on TV.[26] Furthermore, soccer is played at professional leagues across the globe while hundreds of thousands play the game as amateurs. A survey con-

[25]See "Baseball or Football: which sport gets the higher attendance?" Guardian Unlimited, 5 June 2006.

[26]See "2002 FIFA World Cup TV Coverage," FIFA official website, May 13, 2006

ducted by FIFA and published in the Spring of 2001 found that over 240 million people regularly play soccer in more than 200 countries.[27]

What makes soccer especially attractive for our purposes is the fact that in professional premier leagues teams competing for the championships have traditionally been associated with urban centers, each city worth its salt being represented by at least one soccer team in the league. Successful teams in these leagues are the ones that can hire the best talent, a feat which requires command over relatively large resources that need to be raised from fans, supporters, merchandise sales and broadcast revenues. Typically most of these sources are local. Even when there is revenue sharing among teams in the league, studies have found that this does not have a statistically significant effect on the survival probabilities of the teams. Thus, a recent study of several European leagues, where broadcast revenue sharing is more significant than in other countries, concludes that "...as long as teams are located in *cities of widely varying revenue potentials*, cross-subsidization of weak-drawing teams neither provides profit incentives for team owners nor does it promote the survival of weak-drawing clubs."[28] It, therefore, appears to be safe to conclude that teams that credibly contest championships are the ones located in cities which command relatively more resources. One could then use the correspondence between soccer champions and the relative economic importance of the cities which these teams represent to tease out the geographical distribution and concentration of wealth within a given country.

Soccer championship statistics on www.rsssf.com[29] show that around 170 (adult-male) first division leagues have been played in the world in the 1960-1999 period. To understand how soccer relates to geographical distribution of wealth, consider the championships in a decade. In the most decentralized country, soccer championships would be shared by 10 different cities in a 10-year period. In the most centralized country, on the other hand, only one city would possess all the championships (e.g., Istanbul, Turkey, in 1990-99). This predicts for a country 42 different combinations of championship distributions across the cities in a decade (i.e., 10, (9, 1), (8, 2), (8, 1, 1), etc.). Note that a country with three champion-cities in a decade, where the championship distribution, say, is (6, 3, 1), is more decentralized than a country with two champion-cities, where the distribution, say, is (6, 4) (i.e., vertical decentralization). Likewise, a country with three champion-cities and with a championship distribution

[27]"FIFA Survey: approximately 250 million footballers worldwide," FIFA official website, 5 June 2006

[28]See Frick and Prinz (2004).

[29]The Rec.Sport.Soccer Statistics Foundation.

of, say, (6, 2, 2) is more decentralized than the one with (6, 3, 1) (i.e., horizontal decentralization). In our context, the former is preferable to the latter, because, say, competition among lobbies would lead to less distortions if political power is dispersed spatially in a balanced manner.[30]

Given this, the next step is to summarize the data with a statistic. An appropriate statistic is a concentration (or inverse fractionalization) index of the Herfindahl type:

$$H = \sum_{i=1}^{n} s_i^2$$

where $i = 1, 2, ..., n$ is the number of *different* cities that have champions, and $s_i$ is the *share* of city $i$'s championships over the period 1960-1999. This index, labelled SOCCER, would be 0.1 for the least centralized country, and 1 for the most centralized country.

Sample selection is an important issue in using the soccer championship data. From the set of countries for which data are available on www.rsssf.com, we exclude dependent territories (e.g., British Virgin Islands, Martinique) and geographically very small countries (e.g., Andorra, Luxembourg). Most of these do not provide regular data. We also do not use city states (e.g., Singapore, Hong Kong) and transition economies. The notion of urban concentration and our theoretical channels may not be applicable to these countries. We also do not use the US (where there are competing leagues) and the English, Scottish and Welsh leagues, whose other economic data are available in a combined manner as the UK. After this 'cleaning' we are left with the championship data of 103 countries (listed in Table A1). Detailed information on the construction of the SOCCER variable is available in the Appendix.

Another important issue is that even if a regular first division league is played in a country, soccer may not be a widely popular sport that attracts substantial economic resources. For instance, in some British Commonwealth countries, cricket and rugby are equally or more popular than soccer. To check for this effect, in another sample we utilize countries which participated in FIFA World Cup Finals between 1962-1998. We assume that the strength of the soccer industry in a country would translate into the participation of the country in the World Cup Finals. It appears that 45 of 103 countries participated in FIFA World Cup Finals at least once during this period (see Table A2). We find that the results with this FIFA sample are generally consistent with the results

[30]The possibility of countries having different number of teams due to country size or richness is controlled in the estimation.

of the 'all 103 countries' sample, meaning that the use of soccer championship data for a global analysis is justifiable.

Figure 1 depicts a snapshot of the level of income-geographical decentralization relationship for a cross-section of 100 countries (this figure also shows conveniently the distribution of SOCCER values).[31] It is evident that the relationship is negative. The downward slope of the simple regression line fitted is statistically significant. Figure 2 shows the relationship for the growth rate of real GDP per capita. The slope is similarly negative and significant. In fact, the gradient implies that the most centralized and the most decentralized countries have 1.3% difference in their annual average growth rates over the period 1960-1999. Note that these graphs portray only the unconditional relationship between the decentralization and development and as such should be taken with care, due to several econometric concerns (see below). Nevertheless, the negative unconditional relationships are telling.

## 4.2 Estimation

We estimate equations of the following type:

$$Y_i = \mathbf{X}_i^{'}\boldsymbol{\beta} + \varepsilon_i$$

where $i$ denotes countries, Y is the average log per capita income over the 2000-2004 period, $\mathbf{X}_i = \{\mathbf{1}, SOCCER, \mathbf{Z}\}$, where $\mathbf{1}$ is a vector of ones and denotes the constant term, SOCCER is the proxy for geographical decentralization of wealth as observed over the 1960-99 period, $\mathbf{Z}$ is a vector of control variables, and $\varepsilon$ is a random error term. Following the institutions-economic development literature, we use log per capita income as our benchmark development indicator.[32]

[31] Sample size in bi-variate relationships depends on the availability of other data. In our case, although Iraq, Libya and Somalia have the championship data, they drop out from the estimations because consistent national accounts data are not available for them.

[32] Using average log per capita income of the 2000-04 period, that of the 2000-07 period, or those of individual years within this period provides very similar results. Where appropriate we use the 1960-99 averages for some of the time-varying controls, and 1960 values for others. Time lags between the dependent and independent variables aim at mitigating the endogeneity problem, although we also instrument SOCCER explicitly below.

### 4.2.1 Control variables

A measure on urban concentration, like SOCCER, is at the nexus of forces which may be both positively and negatively associated with growth and development. Indeed, the literature on the determinants of urban concentration argues that both economic and political forces influence the level of concentration.[33] Economic forces behind the concentration process are perceived to be rather natural factors, because agents are thought to maximize their welfare and minimize their costs. The deviations from economically optimum levels of concentration are generally ascribed to political forces, especially rent-seeking by economic agents. The latter generally works through favoritism, political instability and restrictions on freedom.[34,35] This suggests that, in our particular case, controlling for the economic determinants of urban concentration on the right-hand side in a (reduced form) regression can help identify the political impact of geographical concentration, i.e., SOCCER, on development, which our theory predicts.[36] Therefore, the following variables have been used to control the economic determinants of urban concentration: openness (Ades and Glaeser 1995, Davis and Henderson 2003), country size (as shown by total population, – Ades and Glaeser 1995, Davis and Henderson 2003, Henderson 2003, Moomaw and Alwosabi 2004), and the share of government expenditure in total expenditure (Wheaton and Shishido 1981, Ades and Glaeser 1995). Krugman (1991) sees a negative link between openness and primacy, while dependency theorists see a positive link. Ades and Glaeser (1995) find empirical support for Krugman. Government consumption might reflect a number of factors like higher transportation and telecommunications expenditure, hence reduced concentration, but it may also reflect the degree of rent-seeking by different groups and, thus, political structure. Both Ades and Glaeser and Wheaton and Shishido find that higher government involvement reduces concentration. Finally, a larger country size implies greater potential market, which can afford greater number of cities, hence lower concentration. Studies generally find a negative effect, but its significance varies. We use the 1960-99 averages of these variables in

[33] Recall the inverted-U shape relationship between primacy and development level.

[34] See Ades and Glaeser (1995) for a list of arguments.

[35] Ades and Glaeser (1995) and Davis and Henderson (2003) find that political determinants of primacy are stronger than economic determinants. In addition, in a robustness analysis, Ades and Glaeser (1995) regress growth on urban primacy (i.e., population primacy) by holding certain economic variables constant, and find that primacy has negative influence on growth.

[36] A perfect identification of political factors within SOCCER via controlling for its economic determinants is, of course, impossible. The data may contain several observable and unobservable other channels regarding the impact of geographical concentration on growth.

the regressions because SOCCER is observed over this period.

Further to these variables, **Z** comprise a wider set of covariates to minimize the omitted variables problem. The list, mainly following Alesina et al. (2000), includes ethnic fractionalization, postwar independence, oil exporting countries, number of guerrilla wars, distance from equator, the shares of population affiliated to Catholic, Protestant, Muslim, Hindu and Confucian religions, and regional dummies (see also Ades and Glaeser 1995, and Davis and Henderson 2003, who check the relevance of regional dummies to primacy). An important problem with most of these variables is that they are related to political forces in the countries, such as colonial background (postwar independence, hence colonization as argued by Acemoglu et al. 2008), conflict and civil instability (ethnic fractionalization, guerrilla warfare), and rent-seeking (oil, government consumption). Thus they may strip the explanatory power of SOCCER in the regressions. In these cases, the sign and significance of SOCCER should be interpreted with care. On the other hand, a wide set of controls minimizes the scope for omitted variables bias (see also Section 6.1).

### 4.2.2 Estimation methodology

As noted above, a number of studies have established an inverted-U shape relationship between primacy and development. Thus, despite the time lags between the dependent variables and SOCCER, an IV method would be appropriate to address a possible reverse causation (which is a concern because SOCCER and development are likely to be time-persistent). However, we also use OLS as a reference point for benchmark 2SLS results.

### 4.2.3 Instruments

We instrument SOCCER with binary indicators of capital city primacy and federalization. To capture historical effects in SOCCER, we also use a group of variables suggested by Acemoglu, Johnson and Robinson (henceforth AJR) (2001, 2002), which are log settler mortality, and urbanization and log population density in 1500s, and Acemoglu, Johnson, Robinson and Yared (henceforth AJRY) (2008), which are constraint on the executive at independence, and the independence year.

- *Primate Capital City:* This variable takes 1 if the capital city is also the primate city in the country, otherwise 0. It is expected that rent-seeking like lobbying and favoritism is more likely to happen in the capital city. Henderson (2003) argues that various forms of favoritism disproportionately draw migrants into the national

capital, resulting in over-concentration. Davis and Henderson (2003) argue that favoritism can take the form of national government ignoring interregional transport and telecommunications, restrictions in capital markets, export/import markets, and licensing of production rights, all favoring firms in national capital. Central bureaucrats and politicians, with the ability to extract rents in the allocation of loans and licenses, can attract local public services to the national capital. This variable is a valid and strong IV as indicated by first-stage regressions, and there are strong reasons to believe that it is exogenous, and excludable from the income equation. The choice of capital city should not be affected by country's development level, and capital city primacy should affect development only through SOCCER and its associated political and economic effects. Figure 3 shows the predicted positive relationship.

- *Federalization*: It is also expected that power in federal countries is geographically dispersed (Mutlu 1989, Ades and Glaeser 1995, Davis and Henderson 2003). In fact, Figure 4 shows that federalization and SOCCER are negatively related. This IV is also valid and strong as found in first-stage regressions, and should be exogenous to development. One question that may arise here is whether federalization can affect development directly. We argue that this is not the case for two reasons. On the theoretical side, federalization is neither a necessary nor a sufficient condition for development. There are various countries in the world which are developed but do not have a federal structure, and others which do have a formal federal structure but are not developed. On the statistical side, the second stage models generally satisfy overidentifying restrictions, which means that the exogeneity condition is met for instruments (i.e., $E(\mathbf{J}_{it}, \varepsilon_{it}) = 0$, where $\mathbf{J}$ is a vector of all instruments). That is, instruments over and above which 'extra' instruments are tested (i.e., those in $\mathbf{J} - \mathbf{S}$ where $\mathbf{S}$ is the base IV) are exogenous (see Wooldridge 2002, p. 123). Having a strong theoretical basis for the exogeneity of the primate capital city indicator above, federalization should therefore not be correlated with the right-hand side, and should thus be excludable.

- *AJR and AJRY instruments:* It is plausible to argue that SOCCER is an indicator of institutional quality within a country. That is, countries with well-established pro-growth institutions should tend, on average, to have more dispersed championships, and those with weaker institutions would allow political power to agglomerate. To find exogenous variation for SOCCER as an institutions measure, we

turn to AJR (2001, 2002) and AJRY (2008) who, in a series of well-established contributions, show that institutional quality within countries can be explained with variables that represent the conditions that colonial powers were faced when they landed in former colonies (i.e., log settler mortality, and urbanization and log population density in 1500s) and with those that represent early political institutions (i.e., constraint on the executive at independence and independence year). While the AJR instruments are valid for former colonies, the AJRY variables cover also non-colonies, and hence allow for testing the implications for a broader range of countries. Following AJR and AJRY, we take these IVs as exogenous to development and excludable from the main equation. Their strength and joint usabililty is discussed in Section 5.2 below. Figures 5, 6, 7 and 8 show that all of these variables have predicted unconditional relationships with SOCCER. This instrumentation strategy enables us to capture both contemporary and historical factors behind the agglomeration of political power.

It should also be noted that a wide list of controls as mentioned above (and see Section 6.1) strengthens the case for instrument excludability if the controls are potentially other channels through which IVs affect the dependent variable. That is, because these controls are included in the first stage regressions, the variation in IVs used in the second stage is net of control variables.

# 5 Empirical results

Data definitions and sources are provided in the appendix. Table 1 presents the summary statistics of key data.

## 5.1 OLS Results

Table 2 presents simple regression results between log per capita income and SOCCER using different samples. The full sample covers 100 countries, the colony sample covers 71 countries, and the samples of countries that participated in FIFA World Cups at least once, twice or three times over the period 1962-1998 cover 44, 30 and 19 countries, respectively. In all cases, SOCCER is negatively and significantly related to the level of development. In the full sample case, SOCCER explains around a quarter of the variation in log per capita income. That FIFA samples reasonably replicate the full sample assures us that the use of SOCCER in a global analysis is reliable.

Table 3 includes the results with control variables using the full sample, colony sample and the sample of countries that participated in FIFA World Cups at least once (note the degrees of freedom problem with other FIFA samples). Across all specifications, SOCCER is negative, but its significance depends on the controls used. As expected, too many controls wash out the explanatory power of SOCCER. This is particularly evident in the full and colony samples, while more controls help identify the negative and significant effect in the FIFA sample. Focusing on the full sample for the purposes of discussion, SOCCER is negative and significant at 1% when the economic determinants of urban concentration are controlled (Model 1). SOCCER is also robust to the inclusion of ethnic fractionalization, postwar independence, guerrilla war, oil production and distance from equator as controls (Model 2). The coefficient, however, is more than halved. The major contributor to the decline in the coefficient is the distance from equator variable, with ethnic fractionalization and postwar independence having some power as well (unreported). Model 3 includes religion and regional dummies (Western Europe is the base region), and SOCCER is significant at 20% level. Our further exploration (unreported) shows that this change is not driven by a single region or religion, and it is the joint presence of all controls that weakens the explanator power of SOCCER.[37]

OLS results may be biased and inconsistent due to reverse causation, so the discussion here should be taken as suggestive.

## 5.2 2SLS Results - First Stage

Table 4a reports the first step results for the full sample and the FIFA sample and Table 4b for the colony sample. The results are very interesting and insightful. First, countries with primate capital cities are associated with higher SOCCER values, indicating greater concentration. Depending on the sample and model specification, countries with primate capitals have, on average, 0.10 to 0.29 points higher SOCCER scores than those whose capital is not the primate city. On the other hand, federal countries are associated with lower SOCCER values. Federal countries have, on average, 0.11 to 0.30 points lower SOCCER scores than non-federal countries. For both variables, colony sample finds higher coefficients and FIFA sample lower coefficients, with the full sample lying in between the two.

Regarding the AJR and AJRY variables, as the Figures in the appendix hint, we

[37] Within the sample that covers only former colonies, it is the joint presence of distance from equator and postwar independence that weakens the explanatory power of SOCCER. This may imply that the Sub-Saharan African regional effect may dominate the SOCCER's effect, relative other colonies.

obtain the expected signs. In the full sample, the country with the highest constraint on the executive score is associated with 0.13-0.21 points lower SOCCER value than the one that has the lowest score, and every 100 years of delayed independence would increase SOCCER by 0.07 to 0.11 points. Utilizing these variables jointly with primate capital city and federalization (Model 7, Table 4a), primate capital, federalization and independence year are significant, while constraint on the executive is marginally significant, all retaining their signs. Note that this model captures two important sources of variation in SOCCER: one that is due to contemporary effects, the other due to historical effects.

In the FIFA sample, only the constraint on the executive is significant, and the independence year is not. Making use of all four variables above delivers predicted signs more often than not, but the explanatory power of the model appears to be modest. This is probably due to small sample size, but there may not also be direct relevance of institutional quality to the strength of the soccer industry.

In the colony sample, constraint on the executive and independence year possess the predicted signs and their statistical significance replicates the full sample case. We additionally use log population density in 1500s. The variable has the expected positive sign in isolation (Model 4, Table 4b), with t-statistic around 1. On the other hand, controlling for primate capital and federalization washes out its explanatory power (see Model 9). We also use log settler mortality. The coefficient 0.076 in Model 13, significant almost at 1%, implies that the country with the highest settler mortality is associated with 0.53 points higher SOCCER score compared to the one with the lowest.[38]

Using all these variables as IVs in the second stage is, however, a different matter. Despite predicted relationships with generally reliable coefficients, the magnitude of the F-statistics in the first stage suggest that not every IV is strong, and that there are a few different combinations of strong instruments that can be used in the second stage. First, primate capital city and federalization provide combinations with high F-statistics (a la Stock and Yogo 2005) in the full and colony samples, hence constitute a solid IV group (Model 3 in Table 4a and 4b). Second, Model 7 in Table 4a, capturing additionally the historical effects by including constraint on the executive and independence year, offers another reliable group. Third, Model 15 in Table 4b suggests that primate capital, federalization and log settler mortality offer a strong IV combination in the context of former colonies, with a high and significant F-statistic.

Finally, the FIFA sample generally delivers low F-statistics. However, the whole purpose of using the FIFA sample is to show that SOCCER can be meaningfully used in

[38]This is a sample of former colonies for which log settler mortality data are available.

a global analysis; with predicted relationships found in the presence of several controls, the FIFA sample has served this purpose very well. We proceed with the full and colony samples next.

## 5.3 2SLS Results - Second Stage

From the outset, our empirical results show that SOCCER is robustly significant in determining log per capita income. Table 5 presents the second stage results with the full sample, utilizing two different IV groups. The 2SLS coefficients are noticeably higher than the OLS coefficients, suggesting that the IV method is appropriate. In addition, all specifications with suitable controls successfully pass the overidentifying restrictions tests. SOCCER's sign and significance are robust to the use of controls, although the coefficient magnitudes change across specifications, revealing important implications.

Models 1 through 4 in Table 5a use primate capital and federalization as IVs. In the basic model, the coefficient is -5.3, significant at 1% level. When determinants of urban concentration - government consumption, openness and log population - are added in Model 2, the coefficient increases by around 20%, again significant at 1%. This may imply that once SOCCER is 'freed' from potentially useful (economic) effects, its political effects appear to be more deleterious for development. Model 3 adds further controls, most of which are of political nature, and as expected SOCCER's coefficient is reduced by around 25%. It is still significant at 1%, however. Finally, SOCCER is robust to the inclusion of religion and regional variables in Model 4. At this stage, compare these results with Table 3 (Models 1 to 3) where the same models are estimated with OLS. Notice that SOCCER is much more precisely estimated in the IV models even in the presence of controls.

Models 5 through 8 make use of constraint on the executive and independence year in addition to primate capital and federalization as IVs. The statistical precision of the SOCCER's estimates are similar as before. Controls help achieve more reliable overidentification results as other potential channels through which IVs can affect the dependent variable are held constant in the first stage. Note that SOCCER's coefficients in Model 6 to 7 are lower than those in Model 2 to 3. This points to the impact of further history in the IV method. Controlling for religion and regional effects leaves SOCCER significant at 5%.

Table 5b presents the results using the colony sample. Again, SOCCER is statistically very significant in determining log per capita income. The first IV group is primate capital and federalization (Model 1 through 4). SOCCER's coefficients in Mod-

els 1 through 3 generally mimick those in Table 5a. The difference is that SOCCER's coefficient in Model 4 is nearly half of that in Table 5a (still significant at 5% level). This implies that religion and and specifically regional controls have more significant impact on the SOCCER's effect on development in this set of countries. Finally, Models 5 through 8 use log settler mortality in addition to primate capital and federalization. The results are still robust and similar to the previous set of findings.

# 6 Sensitivity analysis

## 6.1 Growth approach

We also estimate growth models as a complementary analysis. The practical advantage of growth regressions is that they provide coefficients that can be meaningfully interpreted. Thus we run the following regression:

$$G_{it} = \mathbf{Y}_{it}^{'}\boldsymbol{\gamma} + \epsilon_{it}$$

where $G$ is the average of the annual growth rates of real GDP per capita over the period 1960-99, $\mathbf{Y}_{it} = \{\mathbf{1}, SOCCER, \mathbf{W}\}$ where $\mathbf{W}$ is a vector of controls, and $\epsilon$ is a random error term.

Growth literature has employed an array of variables as controls. Sala-i-Martin et al (2004), in an encompassing and systematic analysis, find 18 variables to be robustly partially correlated with growth in a cross-sectional set-up.[39] So, besides government expenditure, openness and log population, we use all those variables, named BACE controls, on the right-hand side to minimize the scope for omitted variables. Of course, several of these variables are potentially highly correlated with SOCCER. Insignificant variables in these regressions can be legitimately removed through General-to-Specific (GTS) modeling procedure as far as Wald tests allow (a la Hendry 1995). It turns out that elimination of insignificant controls (the procedure generally follows similar reduction paths) leaves SOCCER with a negative and generally significant sign in the regressions.

[39]These variables are East Asian dummy, primary schooling in 1960, investment price, log GDP in 1960, fraction of tropical area, population density in coastal areas in 1960s, malaria prevalence in 1960s, life expectancy in 1960, fraction of Confucian population, African dummy, Latin American dummy, fraction of GDP in mining, Spanish colony, years open, fraction of Muslim population, fraction of Buddhist population, ethnolinguistic fractionalization, and government consumption share in 1960s.

Table 6a presents the results for the full sample. Using primate capital city and federalization as IVs, only Model 4 finds a significant effect for SOCCER, at 10% level. Utilizing two more IVs, however, namely constraint on the executive and independence year, improves the significance levels. Focusing on Model 8, the coefficient -2.089, significant at 5%, suggests an average of around 2% difference in the annual growth rates of countries with the highest and lowest SOCCER scores - e.g., Paraguay and Germany in our sample - over the period 1960-1999 due to differences in the geographical concentration of wealth and its associated effects. This is a significant effect that should not be overlooked.

Table 6b repeats the same exercise with the colony sample, using the two sets of IVs as utilized in Table 5b. Again the results are generally robust and informative. A few consistent findings are noteworthy. First, SOCCER's coefficients follow the same pattern the full sample case. That is, SOCCER is statistically significant in the basic model, when determinants of urban concentration are controlled, and when GTS modelling is applied. As expected, it is insignificant when all BACE controls are used. Finally, the second set of IV group includes log settler mortality in addition to primate capital city and federalization. The pattern of earlier results is mimicked here. Note, however, that the coefficient estimate of SOCCER -2.510 is reasonably close to that in Model 8, Table 6a. It appears that the around 2% difference in the annual growth rates the most and least centralized countries due to SOCCER is a consistent empirical magnitude.[40]

Overall, these results are encouraging because evidence found across samples which include different and often changing compositions of countries is consistent.

## 6.2 Panel data set

It is possible to capture time-wise variation in the data by decomposing the 40-year time period into 10-year intervals. This would help control time-invariant individual (country)-specific effects, where the error structure is of type $\varepsilon_{it} = \mu_i + \upsilon_{it}$, with $\mu_i$ denoting country-specific effects. In the full sample, 100 countries provide 345 decennary observations for the panel. However, the major difficulty with the panel analysis is the availability of time-varying instrumental variables with desirable characteristics. We do not venture into this and digress. A feasible option here - and the one that will keep us connected with the above analysis -, though, is an OLS estimation with lagged

[40]Using primate capital, federalization and log population density in 1500s as IVs (as allowed by F-statistic in Model 9, Table 4b) and log per capita income or growth rate as dependent variables provides qualitatively and quantitatively similar results.

SOCCER. This can mitigate endogeneity but not solve.[41] We must thus note that this analysis is only suggestive and we do not emphasize these results and present. However, a couple of interesting findings are noteworthy. First, pooled and Between-effects findings mimick the cross-sectional results in Table 3. Second, controlling for fixed effects leads to insignificant estimates for SOCCER across all models, implying that within-country relationship between SOCCER and development is insignificant. This suggests that the relationships in our models encompass stronger between-country variation than time-wise variation. With the caveat in mind regarding the estimation methodology, it is possible to conclude here that the explanatory power of SOCCER lies in the cross-country dimension of geographical decentralization.

## 6.3 Decennary cross-sections

It is, however, possible to analyze the relationship for each decade using the same IV methodology above.[42] Besides allowing us to see the decade-specific effects between decentralization and development, this also shows us how the cross-sectional relationship changed over time. The results using primate capital city and federalization are reported in Table 7.[43] We find that while the coefficient of SOCCER is almost always of negative sign, its significance depends on the time period and the model specification. Specifically, its impact is generally negative and significant in the 2000s, and insignificant in the 1970s. In the 1980s and 1990s, it is insignificant only when religion and regional dummies are used as controls, otherwise significant. Thus, these imply that the negative association between decentralization and development is the weakest in the 1970s and becomes stronger over time.

[41] The estimating equation becomes $Y_{it} = \mathbf{X}'_{it-1}\boldsymbol{\beta} + \varepsilon_{it}$, where $t$ denotes time. SOCCER is observed over 10-yearly periods.

[42] The following four equations are estimated: $Y_{i,2000} = \mathbf{X}'_{i,1990}\boldsymbol{\beta} + \varepsilon_{i,2000}$, $Y_{i,1990} = \mathbf{X}'_{i,1980}\boldsymbol{\beta} + \varepsilon_{i,1990}$, $Y_{i,1980} = \mathbf{X}'_{i,1970}\boldsymbol{\beta} + \varepsilon_{i,1980}$, and $Y_{i,1970} = \mathbf{X}'_{i,1960}\boldsymbol{\beta} + \varepsilon_{i,1970}$, where time periods refer to the 10-yearly averages of data for the relevant decade.

[43] We carry out the same analysis with OLS, across full and colony samples, and by using the IV combinations adopted in the above analysis. As expected, the IV coefficients are noticeably higher than the OLS coefficients. Otherwise, results across different samples and IV combinations are qualitatively the same. These extra results are available upon request.

## 6.4 Measurement of SOCCER

The quality of the SOCCER data is the highest when we know all of the champion-cities over 40 years, because in this case championship shares of cities can be calculated precisely for the Herfindahl measure. If the number of champion-cities known is less than 40, then we calculate the Herfindahl index based on the available number of champion-cities. See the Appendix for more detail. One may argue that this would lead to the overestimation of geographical concentration as compared to the highest quality case. Whether this is true or not, however, is not so clear. If, for instance, geographical distribution of wealth does not change over time within a country – which very plausible to argue – the extent of overestimation would remain limited. Nevertheless, we examine the issue in the following way. The mean number of years for which we have SOCCER information across countries is 30. In our sample, there are 25 countries for which all 40 years of information is available and 64 countries for which information is available for more than 30 years. We replicate our cross-sectional estimations using these data points. The results are reported in Table 8. Using different IV combinations based on high F-statistics in the first stage, we obtain the general pattern of results above.[44] Thus, we conclude that the results are not driven by the measurement of SOCCER. This may also point out to the overall tendency that geographical concentration of wealth is persistent within countries over time.

## 6.5 Other Concentration Measures

The robustness of SOCCER can be cross-checked with other measures of geographical centralization, as well as by summarizing the soccer information with different statistics. With regard to the former, ideally one would like to do a horse race among competing measures to the extent that they are comparable. For this purpose we considered data on city populations. The problem here is that data are not consistently available for all cities within a country, with the result that available data almost never add up to 100% of the total population. However, data for cities with population of 750 thousand and above are more consistently available and relatively more comparable to the soccer data in the sense that they provide a measure of the "achievers" in the population, as

[44] We also look at this issue in the panel data set, where 84 countries provide 214 decennary country points with all championships known in a decade and 45 decennary points with 9 championships known (in the latter case, at most only one city's championship share is imprecise, which would not distort the distribution of championships). The results are similar to the cross-sectional case.

in our voice model.[45] Alternatively, one measure that may come closer to SOCCER is one where the "achievers" are treated as one group, with population shares found within that group. Summarizing these data with Herfindahl indices,[46] we more often than not obtained results in terms of sign and significance similar to those SOCCER yields (the results are available upon request). We also considered data on city/state GDPs. In this case data for city-level GDPs are not available for a sufficient number of countries and cities. There are also additional problems with the definition of units. For instance, GDP for New Zealand is available for North and South Islands, but treating them as the only statutory units for GDP results in a counterfactually high concentration.

We also considered summarizing soccer information with other measures. Several of these statistics are undefined when there is only one champion (e.g., Gini index, variance/standard deviation, max-min spread, etc). We experimented with the available data by assigning "1" to the Gini index for such observations. Despite these sub-optimalities, running our regressions with this measure generally yields results similar to the ones already obtained, including the predicted difference of 2% in the annual growth rates of countries with the highest and lowest concentration scores.[47]

We conclude that the soccer information summarized with a Herfindahl statistic offers a consistent and well-defined measure of centralization, and is to be preferred over available alternatives.

## 6.6 Other robustness checks

We carry out a series of further robustness checks. The results are not reported here but available upon request.

*Regional Decomposition of the Sample.* We decompose the whole sample into Latin American and Caribbean, Western Europe and North America, Sub-Saharan Africa, Middle East and North Africa, and East Asia and Pacific country groups. Re-estimating the models does not reveal any significant results. Thus, the relationship between geographical decentralization of wealth and growth has no region-specific characteristics.

[45]The data come from United Nations (2002).

[46]The first measure results in a primacy measure of Henderson (2003)-type if there is only one such city. Its correlation with SOCCER is 0.45 in our sample, while the second measure's correlation is 0.31, both significant. On the other hand, SOCCER's correlation with Henderson's (2003) single-city primacy measure is -0.07 (and insignificant) in our sample. Controlling for this measure in our benchmark regressions (and treating it exogenous vs endogenous, and linear vs non-linear) leaves SOCCER's effects intact.

[47]This measure's correlation with SOCCER is 0.84.

*Initial urbanization.* One may argue that SOCCER may be a measure of urbanization. This may be true to the extent that urbanization is correlated with development, and because SOCCER is also correlated with development, urbanization and SOCCER can be related. However, our arguments are related the effect of SOCCER on development *over and above* that of urbanization, which are often related to political effects. Note that urbanization in 1960 explains only 20% of SOCCER in the full sample, 10% in the colony sample. Also, controlling for urbanization in 1960 in regressions reduces the explanatory power of SOCCER, but leaves it generally significant at conventional levels, esp. in the models with controls.

*Urbanization in 1500s.* AJR (2002)'s primary indicator for showing the reversal of fortune is urbanization in 1500s - log population density in 1500s is used as a complement. Country coverage of the latter is much broader, however. Among the urbanization measures that AJR utilize, the one compiled from Chandler (1987) makes a strong instrument (jointly with federalization) with a first-stage F-statistic higher than 10, covering 36 countries. Re-estimating the IV models above shows that SOCCER remains negative and significant in the basic model and when determinants of urban concentration are controlled. It becomes insignificant when more controls are used. Noting the degrees of freedom problem and finite sample issues with IV methods, we are confident that the AJR (and AJRY) instruments provide a successful exogenous variation in SOCCER.

# 7 Short Case Studies

In this section we provide a few short case studies to illustrate the general mechanisms outlined above with some concrete examples.

Up until quite recently, most developing countries followed a path surprisingly similar to the one Bates (1981) described for the case of tropical Africa. There and elsewhere, governments typically tried to encourage industrialization by transferring resources from agriculture to infant industries protected from foreign competition. For most of Africa, states used monopsonistic agencies to buy exportable agricultural products at prices below those set in world markets. Government revenues were then used to transfer resources to both the bureaucrats themselves and to manufacturing through lending at low interest rates, subsidies for the purchases of intermediate products and capital goods, maintenance of exchange rates favorable to industry, imposition of quotas and tariffs that move the terms of trade against agriculture, and a host of other measures too numerous to

cite, but well-known to development economists.[48] One consequence was that, as Bates (1981, p.120) puts it, "[f]ledgling industries locate in urban areas. Workers and owners, while struggling with each other for their share of industrial profits, possess a common interest in perpetuating policies that increase these profits. They therefore demand policies that shelter and protect these industries." "Lobbying" by these groups tended to be successful as the initial policies typically created "...a few centrally located producers" with the result that "the costs of communicating, negotiating, and coordinating strategies are comparatively low,"[49] while (mostly agricultural) rival interests, on the other hand, were too "numerous and widely scattered" (ibid. p. 88) with the consequence that their costs of organizing were higher. "By maintaining a sheltered industrial order, [African states] generate economic benefits for elites, as well as resources for winning the political backing of influential groups in *urban centers*" (ibid. p.120).

That these urban centers are reflections of political power is the main result of Ades and Glaeser (1995), who find strong empirical support for the thesis that "political forces, even more than economic factors, drive urban centralization." Davis and Henderson (2003), using a significantly larger panel data set, provide convincing evidence that urban concentration is caused by "policies and politics." Further, recalling that soccer was, and remains, the most popular sport in the countries in question, the parallels between the circuses in Rome and soccer in modern day urban agglomerations, should be more than evocative.[50] One unmistakable sign of the eminence of these urban centers, created (in some cases *ex nihilo*) and nurtured through political means and sustained by the political power they thus acquire, is the support they can afford to winning soccer teams. Given the dominance of a few urban centers in the political landscape of most African countries, it is not surprising that the average SOCCER score for Sub-Saharan Africa is the highest (0.69) of all regions considered, with quite a few countries scoring close to the highest (most concentrated) score of 1.

African countries are, of course, by no means the exception. Many developing economies in our data set display the dominance of an urban center over the rest of the country. These centers are typically also the capital cities, which is *prima facie* evidence of the political nature of their preeminence. There are, however, exceptions to this rule. An important example for our purposes is Istanbul, the largest city in

[48] See Ndulu et al. (2008).

[49] The endogenous lobby formation model of Mitra (1999) predicts that industries that are more geographically concentrated would be the ones that get organized in equilibrium.

[50] The title "Trade and Circuses: Explaining Urban Giants" of Ades and Glaeser (1995) is not accidental.

Turkey, responsible for 25% of the country's GDP, and home to 13.4% of the country's total population. The capital city, Ankara, though the second largest city in Turkey, represents only 4.7% of the total population.[51] Turkey's SOCCER score is quite high, 0.7450, indicating a high level of concentration and reflecting primarily the dominance of Istanbul-based soccer clubs. One would then perhaps be tempted to draw the conclusion that this example shows that a country's SOCCER score captures economic rather than political power. However, this would not be a correct inference. As Sevket Pamuk (2009) puts it "[i]Industrialization in Turkey made considerable progress during the 1960s and 1970s. It had a number of important shortcomings, however. It depended strongly on government support and it remained inward oriented. Exports of manufactures remained very low through the 1970s. Geographically, this industry remained concentrated in the Istanbul region, and more generally, in northwest corner of the country. The industrial elites of that era remained strongly dependent on the government, seeking subsidies and tariff protection. They were also opposed to economic integration with Europe for fear that they would not be able to compete with the products of European industry."[52] The industrialists were represented by their organization TUSIAD (The Association of Turkish Industrialists and Businessmen), which, as Bugra (1998) shows, was concentrated heavily in the Istanbul region. This industrial elite, despite the fact that their location did not coincide with the capital city, was successful in its efforts to maintain policies virtually indistinguishable from their counterparts elsewhere in the developing world.[53] They constituted "...an elite group who, not only by virtue of the small number, large size, and geographical concentration of their enterprises, but also thanks to their socio-cultural background, are likely to have different means of communicating, cooperating, and representing their interests than the ones provided by the association" (Bugra, 1998, p.526). It is also instructive to observe that when the Turkish economy started to open up following the deep economic and political crises of the early 1980s, this new "...export-oriented economy widened the industrial base further to the regional centers of Anatolia. The rapid expansion of exports of manufactures played a key role in the rise of these new industrial centers, which began to challenge the Istanbul-based indus-

[51]Istanbul's share of urban population of Turkey is 20.4%, whereas that of Ankara is 7.2%. The figures are for 2001.

[52]Pamuk (2009) reflects the consensus view. See also Onis (1999) and Keyder (2004) among others.

[53]It is worth remembering that Istanbul had been the capital of the Ottoman Empire for almost five centuries (1453-1923), and (as Constantinople) of Byzantium for eleven centuries (330-1453) before that. See Inalcik (2000) for the various price and non-price mechanisms used by the Ottomans to transfer goods, population, wealth, and income to their capital.

trialists...With the rise of the Anatolian tigers, the economic base of the bourgeoisie has been expanding socially and geographically. The AKP government of the recent years has been supported by these emerging elites in the provinces" (Pamuk, 2007, p.26).[54] These "emerging elites" have their own rival business organization MUSIAD (The Association of Independent Industrialists and Businessmen) the geographical location of whose members, as shown by Bugra (1998), is widely dispersed across the country.

Finally, it is useful to have a brief look at urban concentration and SOCCER scores in Latin America as the region is well-known for its "urban giants" and provides a fertile ground on which to test our arguments. In general, the picture of the region that emerges for the period 1939-1990 is similar to the cases we discussed above. As Thorp (1994, p.154) notes [i]In the majority of countries...agriculture for the domestic market continued to suffer from the neglect which it had always endured and export agriculture suffered from the discrimination implicit in the protectionist policies being widely and incoherently followed...It remained the case that the agriculture sector was being taxed by all policies that forced it to sell at below world prices..."[55] As for individual countries, a good place to start is the four countries discussed in Nugent and Robinson (2001): Colombia, Costa Rica, Guatemala, and El Salvador. The main point of Nugent and Robinson (2001) is the importance of political competition for economic outcomes. They argue convincingly that elites in the former two countries were primarily merchants rather than landowners, as in the latter two, and that there was more political competition in the former as compared to the latter. This, as they also recognize, showed up as competition among urban centers. Thus, for Costa Rica, they point out that "...in the absence of a dominant city or town at independence, there was considerable rivalry and conflict among the four main population centers..." (Nugent and Robinson, 2001, p. 19). Furthermore, "each town tried aggressively to lure in-migrants by selling them title to land in small parcels at very low prices. This competition did not end even when Carillo became dictator...As all scholars record, this process of competition involved from the early days, an attempt to attract both labor and political support by offering

[54]The political struggle between the old elite and the new, rising powers is still far from complete and is being played out daily among various power-holders including the executive, the judiciary, the army, and the legislature.

[55]The observations of Thorp (1994) relate to the period 1939-1950. Ffrench-Davis et al. (1994, p.193) point out that for the period 1950-1990 ""...a common feature of the development policies of most Latin American countries during this period was a bias against agriculture, particularly through discriminatory exchange-rate policies and declining domestic terms of trade vis-a-vis manufacturing industry."

property rights to land." (ibid p. 20).[56] The federal, anti-central government sentiment in Colombia, on the other hand, was so strong throughout the nineteenth century that there was a series of civil wars fought, with Granadine Confederation and the United States of Colombia falling by the wayside until finally the formation of the Republic of Colombia in 1886. The fierce political competition is recognized as having contributed to, as Williamson (1992, p.344) puts it, "...the pragmatism which characterized the country's economic development, for no single interest-group could hold power for too long without arriving at some rough compromise with rivals." This competition is reflected in both the unusual number of large cities in Colombia (Medelln, Cali, Barranquilla, Cartagena) despite the presence of a large capital city like Bogot and its low SOCCER score (0.298), well below the Latin American and Caribbean average. That these urban centers were powers to reckon with is well established in the literature. One telling incident is recounted in Thorp (1994, pp.155-56): "The Minister of Economy, Hernn Jaramillo Ocampo, on introducing more severe import restrictions in 1949, tells how he went himself to Medelln to reassure producers that there was actually ample exchange available for their real needs and 'took the opportunity' to remind them of the virtues of purchasing local raw materials. This last point has been recounted in some detail precisely because it is so exceptional." What made the minister go to Medelln is perhaps best understood by the fact that "Medelln, like Monterrey, had an industrially based and cohesive elite that retained considerable power of negotiation with central government or foreign capital. Unlike the Monterrey elite, but like that of Guadalajara, the Medelln elite was relatively numerous, based on medium-scale enterprise, and committed to projects of civic betterment." (De Oliveira and Roberts, 1994, p.279) The result was that as Thorp (1994, p.146) notes, "Colombia, alone among the countries discussed here, implemented a rather moderate protectionist policy and one which sought to avoid the discrimination against agriculture and exports implicit in every other case." By the 1960's Colombia had become the fourth largest industrial economy in Latin America. By contrast, land-owning elites in Guatemala and El Salvador had succeeded by the end of the nineteenth century to implement measures that severely curtailed the movement of labor, trapping workers in coffee plantations (Nugent and Robinson 2001). Both of these countries have substantial primate cities with San Salvador accounting for 64% of the urban population of El Salvador, while the metropolitan Guatemala City is home to 77% of the urban population of Guatemala. The SOCCER score of Guatemala is

[56]The SOCCER score of Costa Rica is 0.35, while the average for Latin America and the Caribbean is 0.5.

among the highest in the region, 0.798, while the small size of El Salvador accounts for its relatively low SOCCER score of 0.364.

For our purposes, it is also important to have a brief look at the paths followed by Argentina and Brazil in the twentieth century. Their histories are significant for our analysis because as Williamson (1992, p.344) points out in Argentina and Brazil "the corporate state...did not include the holders of the most substantial economic power, namely the agrarian economic elites." These states were "largely vehicles for the middle classes and the trade unions, and failed to incorporate the elites who earned the foreign exchange needed to finance industrialization." One outcome was that "[s]tate intervention in the economy brought forth new webs of *intereses*–businessmen, industrialists, professional associations, trade unions–whose welfare often depended on decisions taken by bureaucrats and politicians. The object of these interest-groups, therefore, was to influence public policy so as to extract the best deal for themselves in the distribution of national income" (ibid p. 347). Despite these similarities, there were substantial differences as well. At the beginning of the twentieth century Argentina had achieved levels of income comparable to the US and leading European economies. By 2008, its (at PPP) per-capita income level stood below that of Botswana and Gabon.[57] Brazil, whose per capita GDP was roughly one fifth that of Argentina in 1913[58], consistently grew faster and in 2008 ended up with a per-capita GDP only 40% lower. Given the similarity of policies followed, and political and economic upheavals suffered, this is surprising. Though there are potentially several factors that may help explain the different outcomes, it is worth stressing here the political competition mechanisms highlighted in this paper. Our measure of the mechanisms involved, the SOCCER index, is radically different for the two countries; it takes the value of 0.75 in Argentina, indicating a very high concentration, whereas it is only 0.25 in Brazil. Given the urban concentration observed and the political and economic history of these countries, these scores are not that hard to explain. Buenos Aires, the main beneficiary of the distortionary policies, is home to about 40% of the urban population of Argentina as well as the majority of its industry. The second largest urban center, Cordoba, contains only 4% of the urban population of the country. Historically, Cordoba, as a center for the cattle and cereal interests, could have potentially been a rival to Buenos Aires. However, the movement for a more decentralized state that it spearheaded lost the fight against Buenos Aires in the second half of the nineteenth century.[59] The only other potential rival Rosario (with

[57]See World Economic Outlook Database-October 2009, International Monetary Fund.

[58]See Maddison (2001).

[59]It is interesting to note that the initial mutiny which led to the 1955 Revolucion Libertadora and

again only around 4% of urban population) saw its bid to become the federal capital vetoed on three occasions by the executive. The situation in Brazil was quite different. By 1960, for instance, the top two urban centers, So Paulo and Rio de Janeiro had roughly equal shares of the urban population, 14.7% and 15.2% respectively.[60] Historically, during Empire, Rio de Janeiro had been home to the politically protected sugar barons but later had lost out to the "coffee elite" of So Paulo, who used their political power to have the "valorization" scheme implemented by the Brazilian government by 1906.[61] In 1930, those who had to pay the bill for the scheme, industrialists and urban middle classes as well as the cattle-raisers of Rio Grande do Sul (capital city: Porto Alegre) and Minas Gerais (capital city: Belo Horizonte),[62] gained power in the form of a wealthy cattle-rancher/dictator Gtulio Vargas. Though the rule of Vargas ended in 1954, as Williamson (1992, p.429) points out "there [was] a remarkable continuity in the course of Brazilian development from the Gtulio Vargas era to the military governments of the 1960s and 1970s." Throughout the period, the state directed a programme of industrialization financed by foreign loans and investment. Unlike the Argentinian case, however, there were a plurality of interests present that could press their cases politically. These are represented by the number of urban centers that thrived during this period[63]: in addition to Rio de Janeiro and So Paulo, the list of urban centers, each home to 2-3% of the urban population, include Porto Alegre (the "Gaucho capital" and home town of Vargas), Belo Horizonte, Recife (initially a sugar town, converted later on to an industrial center through financial incentives provided by the central government), Curitiba (initially another cattle town), Fortaleza, and Salvador (another sugar town).[64]

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the deposition of Pern took place in Cordoba.

[60]Note that even the combined weight of these two, 30%, fall short of that of Buenos Aires.

[61]For the uninitiated, this was the scheme that involved keeping world coffee prices high by stockpiling "excess" coffee and releasing it gradually in world markets. As high prices led to more and more production and stockpiling, the state had to borrow money in international markets to finance the scheme. This led to a depreciation of the currency and inflation. See Bulmer-Thomas (2003).

[62]The ranchers of the latter region broke ranks with their coffee-producing brethren to join the former.

[63]Note that these cities are well represented in the list of those that produced champion clubs.

[64]An article in the May 28th 2009 issue of the Economist, reporting from Rosario, highlights the differences between Argentina and Brazil with regard to the basic issues we discuss here : "...agriculture earns Argentina much of its sorely needed foreign currency, so for produce that is allowed to leave the country Ms Kirchner has hiked export taxes as high as 35%. These policies will cause long-term damage to output. Farmers are scrimping on fertilisers to replenish the soils they plunder; some are leaving the land...Farmers are organising themselves politically, using Brazil's powerful farming union as a model." The "voice" option is not the only one used by farmers, they "exit" as well (The Economist, June 18th 2009): "Even tiny Uruguay now exports more beef than its neighbour across the River Plate—thanks

# 8 Concluding Remarks

Starting from the observation that many developing economies are characterized by the dominance of a super metropolis, we have argued that the coexistence of a high level of urban concentration with a low level of economic development is not an accident, the former being emblematic of the causes of the latter. Taking historical Rome as the archetype of a city that centralizes political power to extract resources from the rest of the country, we developed two models of rent-seeking and expropriation which illustrate different mechanisms that relate political competition to economic outcomes. The "voice" model shows that rent-seeking by different interest groups (localized in different specialized cities/regions) would lead to low investment and growth when the number of these groups is low. Increased political competition in the form of more organized groups engaged in countervailing activity is then shown to lead to more secure property rights and higher growth. The "exit" model allows political competition among those with political power (to tax or expropriate from citizens) over a footloose tax base. It showed that when this power is centralized, say, in relatively few urban nodes, tax rates would be higher and growth rates lower. When political power is decentralized across different self-interested rulers in diverse jurisdictions, the competition over the mobile resources leads to lower tax/expropriation rates, and higher long-run growth rate.

Next, we test these hypotheses using international data to construct an index of the distribution of soccer championships across cities in a given economy. In this we are motivated by two considerations. First, the data used in the existing literature to measure urban concentration, namely the share of the largest metropolitan area in the urban population, does not necessarily provide a good metric of the distribution of resources or of wealth among cities and, thus, need not correlate well with the political power they wield in the national political arena. Second, the findings of the economics of sports literature suggest that, as the world's most popular sport, soccer produces successful teams largely in those urban centers that have relatively high economic potential and, ipso facto, political influence. Utilizing a cross-sectional data of 103 countries covering the 1960-1999 period, an instrumental variables estimation followed by a number of sensitivity checks finds strong and robust empirical support for the hypothesis that a lower degree of urban concentration is highly positively correlated with long-run development. Our instrumentation strategy makes use of the arguments proffered by Acemoglu, John-

partly to big investments by Argentines who like its commitment to the rule of law."

son and Robinson (2001, 2002) and Acemoglu, Johnson, Robinson and Yared (2008) in a series of well-established contributions and captures both contemporary and historical effects regarding the politics of geographical concentration. Regressions with growth rate of real GDP per capita, the latter being an alternative to the benchmark development measure log per capita income, suggest that countries with the highest and the lowest concentration scores in our sample - Paraguay and Germany, respectively, are the typical representatives - have around 2% difference in their average annual growth rate in real GDP per capita over the period 1960-1999 due to political agglomeration and its associated effects. This effect is hard to overstate given the large differences it generates in long-run levels of income.

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# Appendix

## 1. Construction of the SOCCER index

Rec.Sport.Soccer Statistics Foundation (RSSSF) is an ambitious organization that was originally formed in 1994 by three contributors. The foundation collects soccer statistics from all over the world with the help of country representatives, who the RSSSF Board must approve as members. The number of members as of September 2009 is 344. RSSSF defines their goal as "..collecting all kind of statistics, in particular league tables from all over the world, on football, and making this information available to those sharing our interest. Moreover, those statistics should be as reliable as possible...".

Members are approved by the Board if they can ensure the correctness of their data. Charter of RSSSF is available at http://www.rsssf.com/charter.html.

The web site of RSSSF provides data on several leagues around the globe. We look at the historical domestic statistics on annual soccer championships in national adult male leagues starting from 1960. Provided as data are the champion soccer clubs for each year. Our first task was to find the cities which these clubs were based in. For a relatively large number of clubs, the cities are somehow indicated on the web site of RSSSF (e.g., Bayern Munchen is based in the city of Munich in Germany, or Raja is shown to be based in Casablanca in Morocco). For those that are not indicated, we went into a laborious task to find the cities, using various sources.[65] After finding the cities, we cross-checked the city names from a world atlas, and other internet sources to see that the cities indeed constitute a separate entity, i.e., not, for instance, a suburb of a metropolitan area (for example, the Swedish team AIK is based in Solno, which is a part of Metropolitan Stockholm. Thus this team is assumed to be located in Stockholm). Such cases were generally rare, however. For a few cases, RSSSF indicates that the information on championships is disputed, so we did not use those entries. For countries that gained their independence after 1960 (e.g., Bangladesh in 1973, Zimbabwe in 1980), we used the information after the independence. In total, we dealt with 944 clubs from 480 cities around the globe.

*Quality of the data.* Data quality is the highest when the champion clubs for a country are known *annually* over 40 years. Because, in this case, the championship shares of all relevant cities are known precisely when calculating the Herfindahl values. In other words, typical championship shares such as 0.025, 0.05, 0.075... are precise. For 25 countries, all 40 annual championships are known over the period 1960-99.

However, going strictly by these criteria would ignore the information on some country points for which we know, for instance, 39 championships. The leagues were not played or abandoned or the title was not awarded in some years for a reason (e.g., due to a bribery scandal in Belgium in 1983, due to civil war in Guineau-Bissau in 1998, and some other reasons in Colombia in 1989 and in France in 1993, etc.). Also, in some countries national soccer leagues were started after 1960 (e.g. in Australia in 1977), or the countries gained their independence after 1960. Moreover, for a few clubs (around 10),

[65]The sources used are: Game Name: Championship Manager 4 (Produced by: EIDOS), ATLAS: Encarte World Atlas 1998 Edition CD, http://www.rsssf.com/country.html#champ, http://www.uefa.com, http://www.fifa.com, http://www.google.com, http://www.megasoccer.com/, http://www.copamundial.de, http://www.unam.mx, http://www.worldfootball.org, http://www.soccercaffe.com, http://www.indianfootball.com, http://www.aboutaball.co.uk.

we could not find the corresponding cities despite intensive efforts. The mean number of years for which SOCCER information is available across countries is 30. Herfindahl index values for such countries are calculated based on the championship shares of the available champion-cities (i.e., if we know, for instance, 39 champions within 40 years, the championship shares will be 0.02564 (=1/39), 0.05128 (=2/39), etc). One may expect that such observations on SOCCER would overstate the geographical concentration of wealth in the respective country as compared to the "complete" SOCCER observations. To address this, we replicate the estimations using more precise SOCCER observations. The results are explained in Section 6.4. In sum, the results are remarkably similar to the case where we use all the observations together.

## 2. Other data sources and definitions

The definitions of most variables are already provided in the text and in Table 1. The data on log per capita income, growth, share of urban population in total population, total population, and shares of trade, government consumption in GDP are obtained from World Bank's World Development Indicators (2003, 2009), CD ROM and online versions. The data on ethnic fractionalization are obtained from Alesina et al. (2003). We obtained the dummy variables on oil producing and landlocked countries and latitude from *Social Indicators and Fixed Factors* data set of *Global Development Network*. Guerilla war data have been obtained from *Banks' Cross National Time Series* dataset. The data on urban primacy have been obtained from Vernon Henderson's web site (www.econ.brown.edu/faculty/henderson/). Primate capital city indicator has been constructed using the information on Henderson's web site. We constructed the dummy variable on federalization from the web site of the Forum of Federations (www.forumfed.org). *CIA World Factbook* has been used to construct the post-war independence dummy. The data on the shares of people affiliated to Muslim, Catholic, Protestant, Hindu and Confucian religions were obtained from La Porta et al. (1999). Data on BACE variables have been obtained from Xavier Sala-i-Martin's web site (http://www.columbia.edu/~xs23/home.html). Data on AJR and AJRY instruments have been provided by Daron Acemoglu.

## Table A1. Full Sample Countries

| World Bank Code | Country | WB Code | Country | WB Code | Country | WB Code | Country |
|---|---|---|---|---|---|---|---|
| DZA | Algeria | EGY | Egypt | LBR | Liberia | IRL | Ireland |
| AGO | Angola | SLV | El Salvador | LBY | Libya | RWA | Rwanda |
| ARG | Argentina | ETH | Ethiopia | MDG | Madagascar | SAU | Saudi Arabia |
| AUS | Australia | FIN | Finland | MWI | Malawi | SEN | Senegal |
| AUT | Austria | FRA | France | MYS | Malaysia | SLE | Sierra Leone |
| BGD | Bangladesh | GAB | Gabon | MLI | Mali | SOM | Somalia |
| BEL | Belgium | GMB | Gambia, The | MRT | Mauritania | ZAF | South Africa |
| BEN | Benin | DEU | Germany | MEX | Mexico | KOR | South Korea |
| BOL | Bolivia | GHA | Ghana | MAR | Morocco | ESP | Spain |
| BWA | Botswana | GRC | Greece | MOZ | Mozambique | LKA | Sri Lanka |
| BRA | Brazil | GTM | Guatemala | NAM | Namibia | SDN | Sudan |
| BFA | Burkina Faso | GIN | Guinea | NPL | Nepal | SWE | Sweden |
| BDI | Burundi | GNB | Guinea-Bissau | NLD | Netherlands | CHE | Switzerland |
| CMR | Cameroon | HND | Honduras | NZL | New Zealand | SYR | Syria |
| CAN | Canada | ISL | Iceland | NIC | Nicaragua | TZA | Tanzania |
| CAF | Central Afr. Rep. | IND | India | NER | Niger | THA | Thailand |
| TCD | Chad | IDN | Indonesia | NGA | Nigeria | TGO | Togo |
| CHL | Chile | IRQ | Iraq | NOR | Norway | TUN | Tunisia |
| COL | Colombia | IRN | Iran | OMN | Oman | TUR | Turkey |
| COG | Congo, Rep. | ISR | Israel | PAK | Pakistan | UGA | Uganda |
| ZAR | Congo, DR. | ITA | Italy | PAN | Panama | ARE | UAE |
| CRI | Costa Rica | CIV | Cote d'Ivoire | PNG | P. New Guinea | URY | Uruguay |
| CYP | Cyprus | JAM | Jamaica | PRY | Paraguay | VEN | Venezuela |
| DNK | Denmark | JPN | Japan | PER | Peru | ZMB | Zambia |
| DOM | Dom. Rep. | JOR | Jordan | PHL | Philippines | ZWE | Zimbabwe |
| ECU | Ecuador | KEN | Kenya | PRT | Portugal | | |

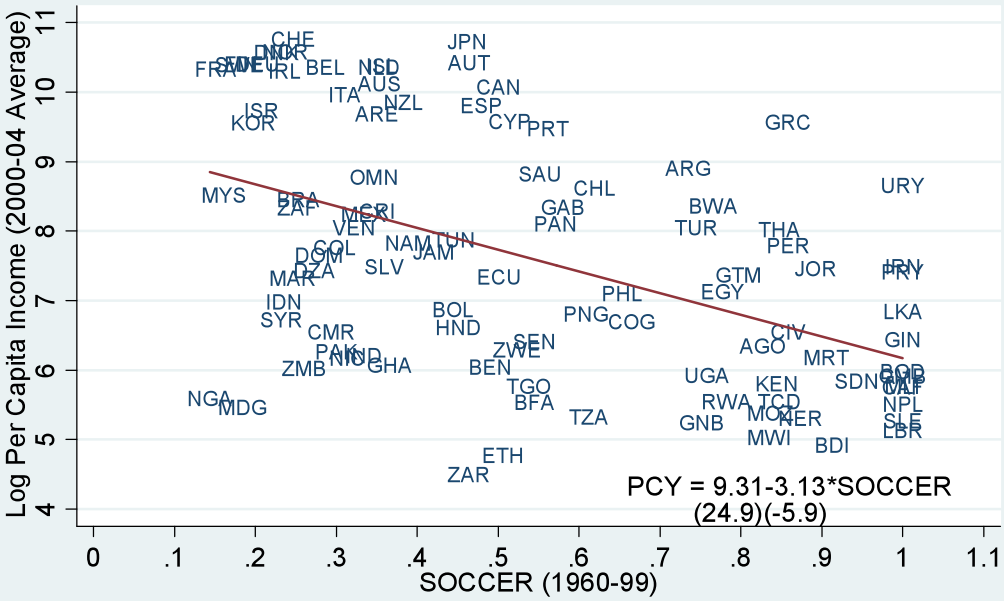
## Table A2. FIFA World Cup Finals Participants, 1962-1998

| Country | Finals Qualified |
|---|---|
| Algeria | ’82 ’86 |
| Argentina | ’62 ’66 ’74 ’78 ’82 ’86 ’90 ’94 ’98 ’94 ’98 |
| Australia | ’74 |
| Austria | ’78 ’82 ’90 ’98 |
| Belgium | ’70 ’82 ’86 ’90 ’94 ’98 |
| Bolivia | ’94 |
| Brazil | ’62 ’66 ’70 ’74 ’78 ’82 ’86 ’90 ’94 ’98 |
| Cameroon | ’82 ’90 ’94 ’98 |
| Canada | ’86 |
| Chile | ’62 ’66 ’74 ’82 ’98 |
| Colombia | ’62 ’90 ’94 ’98 |
| Congo, DR. | ’74 |
| Costa Rica | ’90 |
| Denmark | ’86 ’98 |
| Egypt | ’90 |
| El Salvador | ’70 ’82 |
| France | ’66 ’78 ’82 ’86 ’98 |
| West Germany | ’62 ’66 ’70 ’74 ’78 ’82 ’86 ’90 |
| Greece | ’94 |
| Honduras | ’82 |
| Iran | ’78 ’98 |
| Iraq | ’86 |
| Ireland, Rep. | ’90 ’94 |
| Israel | ’70 |
| Italy | ’62 ’66 ’70 ’74 ’78 ’82 ’86 ’90 ’94 ’98 |
| Jamaica | ’98 |
| Japan | ’98 |
| Korea, Rep. | ’86 ’90 ’94 ’98 |
| Mexico | ’62 ’66 ’70 ’78 ’86 ’94 ’98 |
| Morocco | ’70 ’86 ’94 ’98 |
| Netherlands | ’74 ’78 ’90 ’94 ’98 |
| N. Zealand | ’82 |
| Nigeria | ’94 ’98 |
| Norway | ’94 ’98 |
| Paraguay | ’86 ’98 |
| Peru | ’70 ’78 ’82 |
| Portugal | ’66 ’86 |
| S. Arabia | ’94 ’98 |
| S.Africa | ’98 |
| Spain | ’62 ’66 ’78 ’82 ’86 ’90 ’94 ’98 |
| Sweden | ’70 ’74 ’78 ’90 ’94 |
| Switzerland | ’62 ’66 ’94 |
| Tunisia | ’78 ’98 |
| UAE | ’90 |
| Uruguay | ’62 ’66 ’70 ’74 ’86 ’90 |

**Notes**: Excludes the US, England, Scotland, Northern Ireland, Haiti, Kuwait and transition countries (and therefore, Germany in the 1990-99 period).

## Figure 1. Log Per Capita Income vs. SOCCER

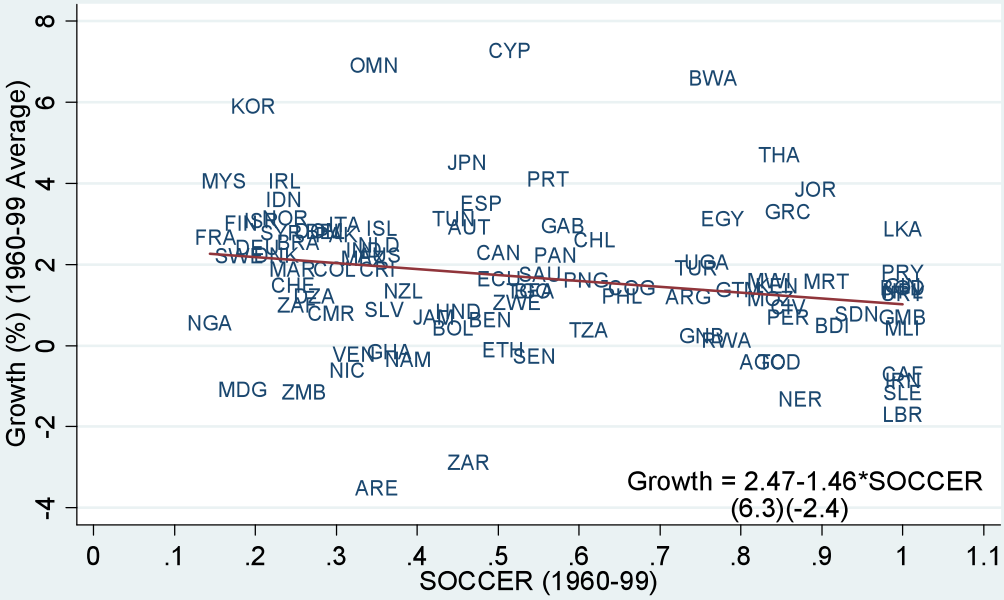
Cross-Sectional Data Set




Note: Robust t-statistics underneath the coefficients.

## Figure 2. Growth vs. SOCCER

Cross-Sectional Data Set




Note: Robust t-statistics underneath the coefficients.

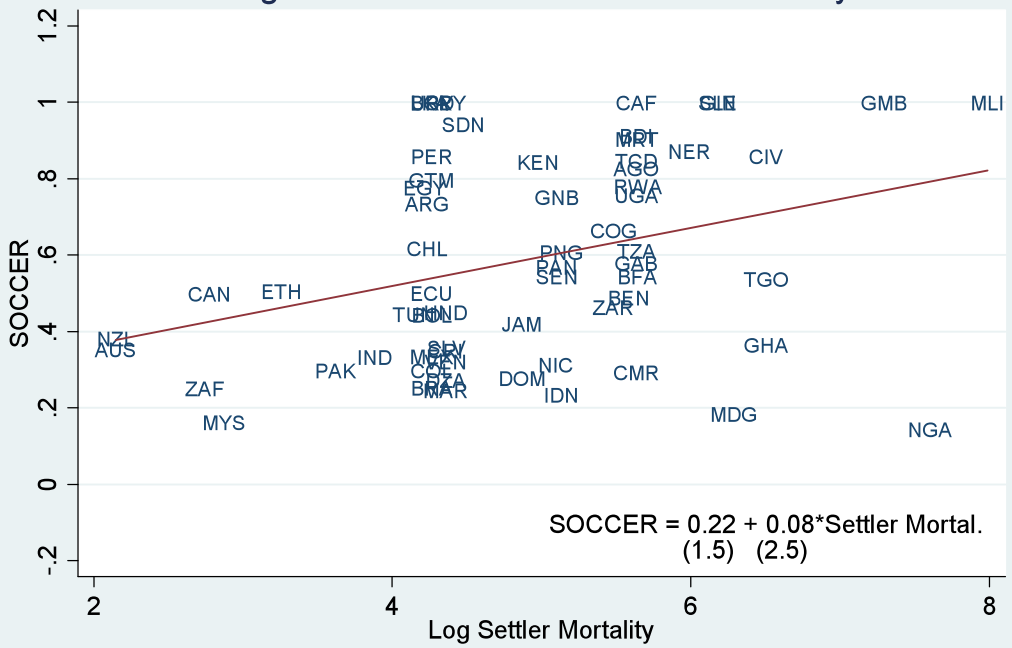
## Figure 3. SOCCER and Primate Capital Cities


Note: Robust t-statistics underneath the coefficients.

## Figure 4. SOCCER and Federal Countries

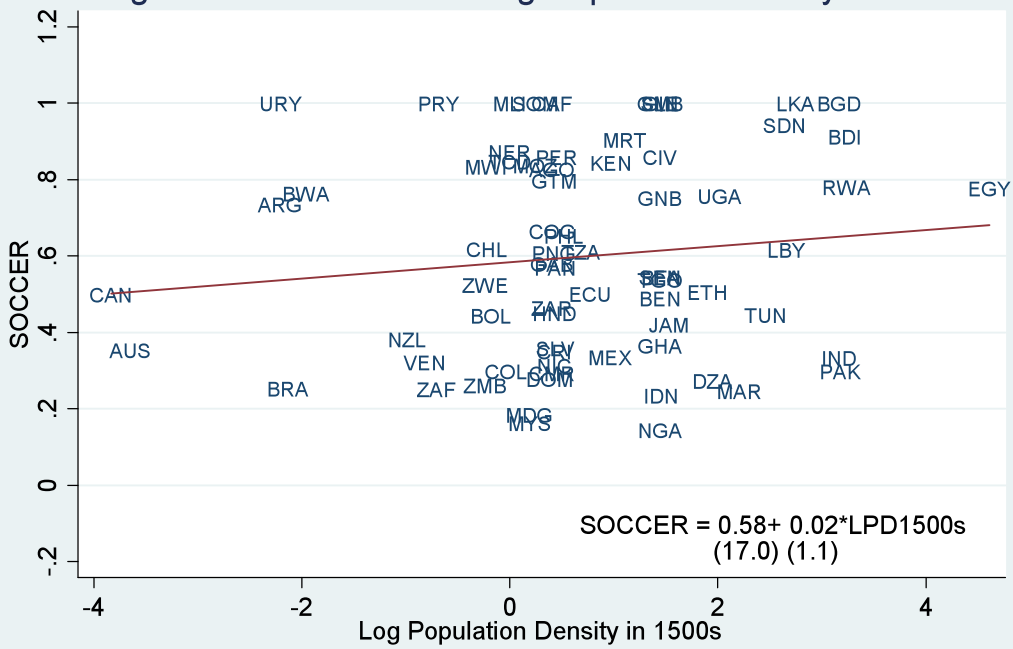

Note: Robust t-statistics underneath the coefficients.

## Figure 5. SOCCER and Settler Mortality



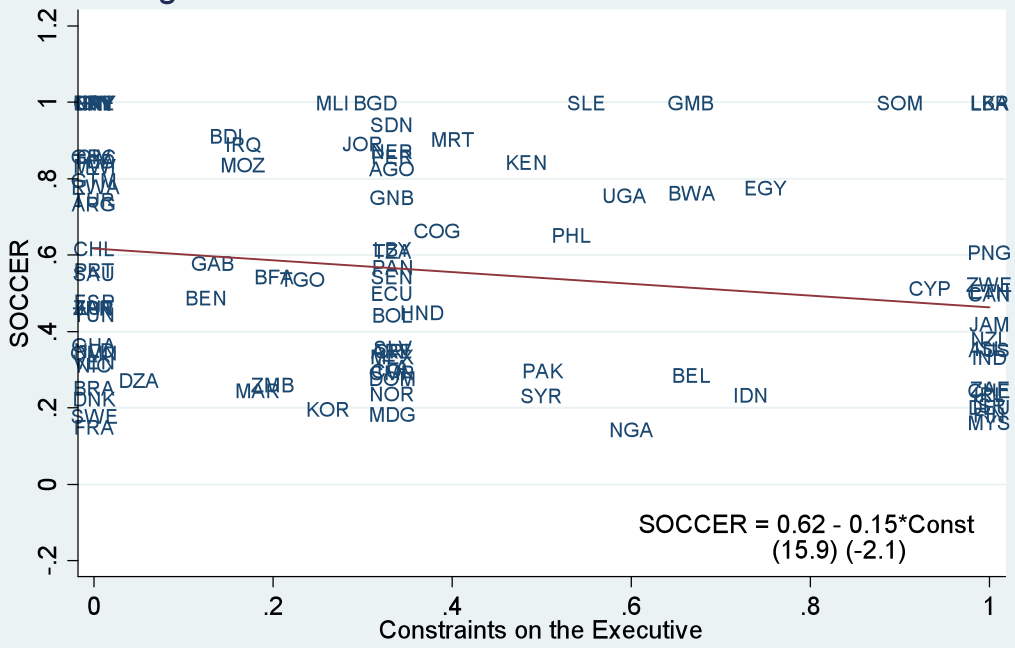

Note: Robust t-statistics underneath the coefficients. Colonies only.

## Figure 6. SOCCER and Log Population Density in 1500s



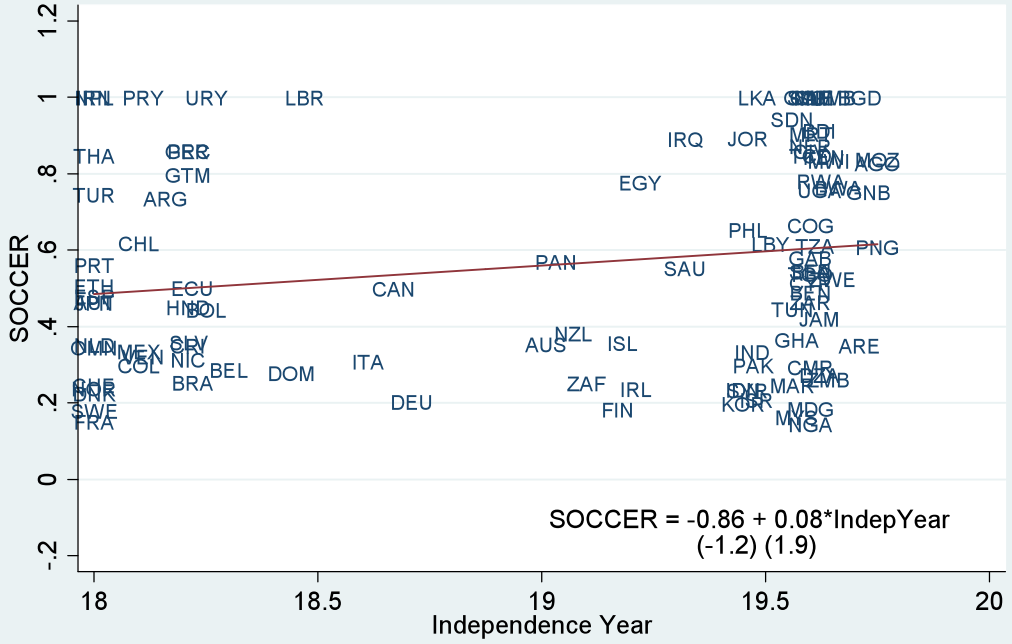

Note: Robust t-statistics underneath the coefficients. Colonies only.

## Figure 7. SOCCER and Constraints on the Executive




Note: Robust t-statistics underneath the coefficients.

## Figure 8. SOCCER and Independence Year




Note: Robust t-statistics underneath the coefficients.

**Table 1. Summary Statistics**

| Variable | Mean | Median | Max | Min | Std. Dev. | N |
|---|---|---|---|---|---|---|
| SOCCER | 0.558 | 0.501 | 1.000 | 0.144 | 0.278 | 103 |
| Log PC Inc. (2000-04) | 7.580 | 7.424 | 10.761 | 4.494 | 1.779 | 100 |
| Growth (1960-99) (%) | 1.671 | 1.542 | 7.282 | -3.506 | 1.844 | 100 |
| Trade/GDP (%) | 57.591 | 52.579 | 120.099 | 15.024 | 25.279 | 102 |
| Govt Cons./GDP (%) | 15.103 | 14.026 | 36.088 | 6.372 | 5.763 | 102 |
| Total Population (/1000) | 24361 | 7656 | 668713 | 223 | 69294 | 103 |
| Primate Capital City | 0.840 | 1.000 | 1.000 | 0.000 | 0.357 | 103 |
| Federalization | 0.149 | 0.000 | 1.000 | 0.000 | 0.351 | 103 |
| Log Settler Mortailty | 4.862 | 4.868 | 7.986 | 1.058 | 1.246 | 67 |
| Log Pop. Density 1500s | 0.700 | 0.432 | 4.610 | -3.831 | 1.534 | 71 |
| Cons. On Exec. | 0.372 | 0.333 | 1.000 | 0.000 | 0.364 | 102 |
| Indep. Year (/100) | 19.004 | 19.455 | 19.750 | 18.000 | 0.691 | 102 |

N: Number of observations

**Table 2. Income Level Regressions - Different Samples - OLS - Cross-section**

| | Dependent Variable. Log Per Capita Income (2000-2004) | | | | |
|---|---|---|---|---|---|
| | **Full Sample** | **FIFA -1** | **FIFA -2** | **FIFA-3** | **Colony Sample** |
| Soccer | -3.132*** | -1.521** | -1.510* | -1.465* | -1.572*** |
| | (-5.908) | (-2.036) | (-1.897) | (-1.942) | (-3.016) |
| Constant | 9.301*** | 9.443*** | 9.554*** | 9.771*** | 7.802*** |
| | (24.93) | (20.79) | (17.71) | (18.71) | (21.25) |
| No of obs. | 100 | 44 | 30 | 19 | 71 |
| R-squared | 0.24 | 0.06 | 0.08 | 0.08 | 0.10 |

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. FIFA-1: Countries that participated in FIFA World Cup at least once during 1962-1998. FIFA-2: Countries that participated in FIFA World Cup at least twice during 1962-1998. FIFA-3: Countries that participated in FIFA World Cup at least three times during 1962-1998.

## Table 3. Income Level Regressions with Controls - OLS - Cross-section

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| | **Dependent Variable: Log Per Capita Income (2000-2004 average)** | | | | | | | | |
| | **Full Sample** | | | **Colony Sample** | | | **FIFA-1 Sample** | | |
| Soccer | -2.826*** | -1.112*** | -0.457 | -1.636*** | -0.555 | -0.152 | -0.602 | -1.374** | -1.163* |
| | (-5.092) | (-2.945) | (-1.246) | (-2.877) | (-1.335) | (-0.365) | (-0.664) | (-2.190) | (-1.756) |
| Govt Cons. | 0.0675** | -0.00882 | 0.0127 | 0.00861 | -0.0322 | -0.0129 | 0.164*** | 0.0350 | 0.0284 |
| | (2.091) | (-0.422) | (0.649) | (0.247) | (-1.328) | (-0.500) | (3.111) | (0.928) | (0.952) |
| Openness | 0.00439 | 0.0179*** | 0.00690 | 0.00659 | 0.0268*** | 0.0153** | -0.00659 | -0.00252 | -0.00346 |
| | (0.499) | (3.412) | (1.308) | (0.584) | (3.778) | (2.178) | (-0.572) | (-0.322) | (-0.483) |
| Log Total Pop. | 0.0656 | 0.0469 | -0.00444 | -0.0457 | 0.0649 | 0.0518 | -0.0945 | -0.183 | -0.250 |
| | (0.424) | (0.509) | (-0.0481) | (-0.316) | (0.507) | (0.368) | (-0.390) | (-0.910) | (-1.485) |
| Eth. Frac. | | -1.447*** | -0.278 | | -0.658 | 0.0558 | | -0.350 | 0.609 |
| | | (-3.008) | (-0.716) | | (-1.321) | (0.111) | | (-0.575) | (0.882) |
| Postwar Indep. | | -0.968*** | -0.137 | | -1.333*** | -0.678 | | -1.141*** | -0.672 |
| | | (-3.830) | (-0.419) | | (-5.355) | (-1.561) | | (-2.992) | (-1.466) |
| Guer. War | | 0.104 | -0.241 | | 0.0157 | -0.418 | | 0.401 | 0.399 |
| | | (0.296) | (-0.764) | | (0.0390) | (-0.952) | | (0.519) | (0.544) |
| Oil Prod. | | 0.382 | 0.863** | | 0.340 | 0.632 | | 0.0872 | 0.669 |
| | | (1.106) | (2.350) | | (0.856) | (1.483) | | (0.134) | (1.160) |
| Latitude | | 0.0461*** | 0.0478*** | | 0.0511*** | 0.0594*** | | 0.0601*** | 0.0466*** |
| | | (5.416) | (4.275) | | (4.587) | (4.291) | | (4.616) | (3.186) |
| Muslim | | | -0.0134*** | | | -0.00563 | | | -0.0167*** |
| | | | (-3.473) | | | (-1.079) | | | (-3.338) |
| Catholic | | | -0.00600 | | | -0.000280 | | | -0.00606 |
| | | | (-1.295) | | | (-0.0427) | | | (-0.763) |
| Hindu | | | -0.0162** | | | 0.00452 | | | 0 |
| | | | (-2.141) | | | (0.581) | | | () |
| Protestant | | | -0.0102** | | | -0.000569 | | | -0.00936 |
| | | | (-2.195) | | | (-0.0665) | | | (-1.175) |
| Conf. | | | 0.00600 | | | 0.0175* | | | 0.0138 |
| | | | (0.851) | | | (1.990) | | | (1.546) |
| Latin Amer. | | | -0.621 | | | -0.700 | | | -0.850* |
| | | | (-1.645) | | | (-1.657) | | | (-1.889) |
| SS. Afr. | | | -1.923*** | | | -1.497*** | | | -2.015*** |
| | | | (-3.547) | | | (-4.024) | | | (-2.901) |
| South Asia | | | -1.580*** | | | -1.770*** | | | 0 |
| | | | (-2.889) | | | (-3.778) | | | () |
| MENA | | | -0.926** | | | -1.405*** | | | -0.291 |
| | | | (-2.085) | | | (-3.204) | | | (-0.406) |
| E.As. & Pac. | | | -0.290 | | | | | | |
| | | | (-0.674) | | | | | | |
| Constant | 7.273*** | 6.951*** | 8.131*** | 7.771*** | 6.034*** | 6.653*** | 7.766*** | 9.011*** | 10.83*** |
| | (3.900) | (6.507) | (6.343) | (4.311) | (4.010) | (3.519) | (2.913) | (4.612) | (5.544) |
| No of obs. | 100 | 100 | 100 | 71 | 71 | 71 | 44 | 44 | 44 |
| Adj. R-squared | 0.27 | 0.76 | 0.84 | 0.08 | 0.63 | 0.71 | 0.21 | 0.70 | 0.81 |

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

## Table 4a. First Stage Regressions of SOCCER – OLS - FULL and FIFA-1 Samples

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Dependent Variable: SOCCER** | | | | | | | | | | | | | |
| | **FULL SAMPLE** | | | | | | | **FIFA-1 SAMPLE** | | | | | | |
| Primate City - Capital | 0.200*** | | 0.122** | | | | 0.109* | 0.183*** | | 0.161*** | | | | 0.10 |
| | (3.577) | | (2.110) | | | | (1.786) | (3.306) | | (3.003) | | | | (1.79 |
| Federal | | -0.269*** | -0.225*** | | | | -0.175*** | | -0.114* | -0.0630 | | | | -0.05 |
| | | (-5.489) | (-4.122) | | | | (-2.786) | | (-1.693) | (-0.967) | | | | (-0.8 |
| Constrain on the Exec. | | | | -0.154** | | -0.207*** | -0.134* | | | | -0.211*** | | -0.189** | -0.12 |
| | | | | (-2.081) | | (-2.761) | (-1.674) | | | | (-2.724) | | (-2.566) | (-1.51 |
| Independence Year | | | | | 0.0746* | 0.104*** | 0.0742* | | | | | -0.0766 | -0.0370 | -0.04 |
| | | | | | (1.904) | (2.659) | (1.823) | | | | | (-1.515) | (-0.769) | (-0.88 |
| Constant | 0.389*** | 0.598*** | 0.489*** | 0.617*** | -0.858 | -1.340* | -0.866 | 0.296*** | 0.466*** | 0.329*** | 0.510*** | 1.865* | 1.193 | 1.22 |
| | (8.429) | (19.97) | (8.888) | (15.84) | (-1.152) | (-1.816) | (-1.127) | (10.05) | (10.24) | (7.966) | (9.648) | (1.954) | (1.317) | (1.29 |
| No of obs. | 103 | 103 | 103 | 102 | 102 | 102 | 102 | 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| Adj. R-squared | 0.06 | 0.11 | 0.12 | 0.03 | 0.02 | 0.08 | 0.15 | 0.07 | 0.02 | 0.06 | 0.09 | 0.02 | 0.08 | 0.0 |
| F test | 12.80*** | 30.13*** | 17.51*** | 4.33** | 3.62* | 6.14*** | 10.00*** | 10.93*** | 2.87* | 5.17*** | 7.42*** | 2.30 | 3.61** | 2.45 |

## Table 4b. First Stage Regressions of SOCCER – OLS - COLONY Sample

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Dependent Variable: SOCCER** | | | | | | | | | | | | | | |
| Primate Capital | 0.235*** | | 0.151** | | | | | 0.168** | 0.159** | 0.155** | 0.289*** | 0.206*** | | 0.197** | 0. |
| | (3.861) | | (2.136) | | | | | (2.297) | (2.214) | (2.113) | (5.801) | (3.293) | | (2.492) | (2 |
| Federal | | -0.296*** | -0.236*** | | | | | -0.200** | -0.244*** | -0.189** | | -0.213*** | | -0.178* | -0. |
| | | (-4.693) | (-3.061) | | | | | (-2.305) | (-3.131) | (-2.140) | | (-2.674) | | (-1.933) | (- |
| Log PD 1500 | | | | 0.0212 | | | | -0.0150 | -0.00338 | | | | | -0.0125 | |
| | | | | (1.095) | | | | (-0.782) | (-0.187) | | | | | (-0.592) | |
| Const. on Exec. | | | | | -0.131 | | -0.161* | -0.0750 | | -0.0832 | | | | -0.0671 | |
| | | | | | (-1.482) | | (-1.852) | (-0.830) | | (-0.968) | | | | (-0.555) | |
| Indep. Year | | | | | | 0.0951* | 0.109** | 0.0858* | | 0.0720 | | | | 0.0724 | |
| | | | | | | (1.977) | (2.348) | (1.711) | | (1.474) | | | | (1.104) | |
| Log Set. Mort. | | | | | | | | | | | | | 0.076** | 0.00982 | 0 |
| | | | | | | | | | | | | | (2.526) | (0.207) | (1 |
| Constant | 0.398*** | 0.636*** | 0.501*** | 0.584*** | 0.648*** | -1.229 | -1.435 | -1.121 | 0.504*** | -0.856 | 0.347*** | 0.450*** | 0.215 | -0.947 | 0 |
| | (7.933) | (19.39) | (7.411) | (16.98) | (13.75) | (-1.334) | (-1.611) | (-1.161) | (7.347) | (-0.906) | (10.56) | (7.850) | (1.511) | (-0.834) | (1 |
| No of obs. | 73 | 73 | 73 | 71 | 72 | 72 | 72 | 71 | 71 | 72 | 63 | 63 | 63 | 63 | |
| Adj. R-squared | 0.09 | 0.13 | 0.16 | 0.01 | 0.02 | 0.04 | 0.06 | 0.16 | 0.15 | 0.17 | 0.14 | 0.19 | 0.09 | 0.17 | |
| F test | 14.91*** | 20.03*** | 14.04*** | 1.20 | 2.20 | 3.91* | 4.60** | 6.72*** | 9.85*** | 7.10*** | 33.65*** | 15.70*** | 6.38** | 5.61*** | 9. |

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Models with F-statistics in rectangles constitute the first-stage models.

## Table 5a. Income Levels 2SLS Regressions - FULL SAMPLE

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | **Dependent Variable: Log Per Capita Income (2000-2004 Average)** | | | | | | | |
| Soccer | -5.252*** | -6.196*** | -4.746*** | -5.644** | -7.136*** | -8.863*** | -3.463** | -3.147** |
| | (-2.841) | (-2.886) | (-2.684) | (-2.083) | (-4.522) | (-4.720) | (-2.432) | (-2.147) |
| Govt Cons. | | 0.047 | -0.010 | 0.017 | | 0.036 | -0.008 | 0.013 |
| | | (1.564) | (-0.438) | (0.644) | | (0.948) | (-0.424) | (0.741) |
| Openness | | -0.005 | 0.006 | -0.007 | | -0.011 | 0.011 | -0.0003 |
| | | (-0.409) | (0.799) | (-0.643) | | (-0.826) | (1.594) | (-0.042) |
| Log Total Population | | -0.189 | -0.225 | -0.522* | | -0.395 | -0.131 | -0.277 |
| | | (-0.833) | (-1.247) | (-1.693) | | (-1.555) | (-0.896) | (-1.590) |
| Eth. Frac. | | | -1.345** | -0.823 | | | -1.377*** | -0.531 |
| | | | (-2.186) | (-0.894) | | | (-2.630) | (-0.927) |
| Postwar Indep. | | | -0.727** | -0.644 | | | -0.809*** | -0.404 |
| | | | (-2.061) | (-1.144) | | | (-2.767) | (-1.055) |
| Guer. War | | | 0.459 | 0.481 | | | 0.347 | 0.107 |
| | | | (0.883) | (0.669) | | | (0.790) | (0.254) |
| Oil Prod. | | | 0.251 | 0.369 | | | 0.285 | 0.628 |
| | | | (0.547) | (0.602) | | | (0.749) | (1.483) |
| Latitude | | | 0.032*** | 0.0384** | | | 0.037*** | 0.045*** |
| | | | (2.584) | (2.275) | | | (3.736) | (4.201) |
| Muslim | | | | -0.00235 | | | | -0.008 |
| | | | | (-0.239) | | | | (-1.166) |
| Catholic | | | | 0.001 | | | | -0.003 |
| | | | | (0.036) | | | | (-0.435) |
| Hindu | | | | -0.00928 | | | | -0.013 |
| | | | | (-0.533) | | | | (-1.232) |
| Protestant | | | | -0.018* | | | | -0.015** |
| | | | | (-1.872) | | | | (-2.509) |
| Conf. | | | | 0.026** | | | | 0.016* |
| | | | | (1.972) | | | | (1.746) |
| Latin Amer. | | | | -0.630 | | | | -0.581* |
| | | | | (-1.211) | | | | (-1.663) |
| SS. Africa | | | | -0.300 | | | | -1.019* |
| | | | | (-0.351) | | | | (-1.927) |
| South Asia | | | | 0.206 | | | | -0.569 |
| | | | | (0.149) | | | | (-0.722) |
| MENA | | | | -0.373 | | | | -0.595 |
| | | | | (-0.533) | | | | (-1.234) |
| Constant | 10.47*** | 12.25*** | 12.16*** | 15.73*** | 11.51*** | 16.12*** | 10.31*** | 12.03*** |
| | (9.949) | (3.426) | (4.352) | (3.471) | (12.93) | (4.430) | (4.724) | (4.968) |
| IV | | Primate Capital, Federal | | | | Primate Capital, Federal, Cons Exec, Indep Year | | |
| No of obs. | 100 | 100 | 100 | 100 | 99 | 99 | 99 | 99 |
| Hansen's J (p-value) | 0.59 | 0.52 | 0.62 | 0.69 | 0.03 | 0.05 | 0.24 | 0.29 |

Robust z-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

## Table 5b. Income Levels 2SLS Regressions - COLONY SAMPLE

| | (1) | (2) | (3) | (4) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|
| | **Dependent Variable: Log Per Capita Income (2000-2004 Average)** | | | | | | | |
| Soccer | -4.415** | -6.604*** | -4.464** | -3.001** | -5.485*** | -7.261*** | -4.011*** | -2.741** |
| | (-2.260) | (-2.764) | (-2.532) | (-2.189) | (-3.131) | (-3.484) | (-2.852) | (-2.379) |
| Govt Cons. | | 0.027 | -0.008 | 0.004 | | 0.053 | 0.001 | 0.003 |
| | | (0.607) | (-0.272) | (0.167) | | (1.101) | (0.001) | (0.123) |
| Openness | | -0.016 | 0.004 | 0.005 | | -0.022 | 0.006 | 0.006 |
| | | (-0.889) | (0.344) | (0.507) | | (-1.310) | (0.672) | (0.633) |
| Log Pop. Tot. | | -0.545* | -0.380* | -0.264 | | -0.608* | -0.314 | -0.201 |
| | | (-1.712) | (-1.655) | (-1.375) | | (-1.877) | (-1.556) | (-1.107) |
| Eth. Frac. | | | -1.224 | -0.641 | | | -0.934 | -0.451 |
| | | | (-1.584) | (-0.728) | | | (-1.196) | (-0.518) |
| Postwar Indep. | | | -0.651 | -0.731 | | | -0.735* | -0.673 |
| | | | (-1.436) | (-1.497) | | | (-1.660) | (-1.359) |
| Guer. War | | | 0.412 | -0.086 | | | 0.292 | -0.146 |
| | | | (0.814) | (-0.166) | | | (0.497) | (-0.253) |
| Oil Prod. | | | 0.039 | 0.349 | | | -0.0261 | 0.282 |
| | | | (0.074) | (0.866) | | | (-0.051) | (0.675) |
| Latitude | | | 0.039** | 0.054*** | | | 0.042** | 0.0563*** |
| | | | (2.363) | (3.325) | | | (2.511) | (3.324) |
| Muslim | | | | -0.002 | | | | -0.002 |
| | | | | (-0.163) | | | | (-0.194) |
| Catholic | | | | 0.004 | | | | 0.005 |
| | | | | (0.491) | | | | (0.539) |
| Hindu | | | | -0.010 | | | | -0.010 |
| | | | | (-1.249) | | | | (-0.998) |
| Protestant | | | | -0.006 | | | | -0.002 |
| | | | | (-0.583) | | | | (-0.189) |
| Conf. | | | | 0.022* | | | | 0.023* |
| | | | | (1.736) | | | | (1.880) |
| Latin Amer. | | | | -0.784* | | | | -0.688 |
| | | | | (-1.792) | | | | (-1.442) |
| SS. Africa | | | | -0.718 | | | | -0.644 |
| | | | | (-1.484) | | | | (-1.370) |
| MENA | | | | -1.354* | | | | -1.202* |
| | | | | (-1.923) | | | | (-1.793) |
| Constant | 9.475*** | 16.15*** | 13.22*** | 11.29*** | 10.09*** | 17.11*** | 12.07*** | 10.25*** |
| | (7.883) | (3.480) | (3.941) | (4.183) | (9.337) | (3.904) | (4.496) | (3.924) |
| IVs | | Primate Capital, Federal | | | | Primate Capital, Federal, Log Settler Mortality | | |
| No of obs. | 71 | 71 | 71 | 71 | 63 | 63 | 63 | 63 |
| Hansen's J (p) | 0.82 | 0.36 | 0.34 | 0.50 | 0.10 | 0.09 | 0.32 | 0.61 |

Robust z-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

## Table 6a. Growth 2SLS Regressions - FULL SAMPLE

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | **Dependent Variable: Growth Rate of Real GDP Per Capita (1960-1999 average)** | | | | | | | |
| Soccer | -0.856 | 0.166 | -2.292 | -3.269* | -2.738** | -2.632 | -3.755 | -2.089** |
| | (-0.601) | (0.0780) | (-0.545) | (-1.937) | (-2.495) | (-1.636) | (-1.503) | (-1.982) |
| Govt Cons. | | 0.0201 | -0.0386 | | | 0.0130 | -0.0731 | |
| | | (0.397) | (-0.387) | | | (0.310) | (-1.026) | |
| Openness | | 0.0224** | 0.00266 | 0.0134** | | 0.0161 | -0.00194 | |
| | | (2.101) | (0.164) | (2.049) | | (1.400) | (-0.172) | |
| Log Total Pop. | | 0.396 | 0.0578 | | | 0.177 | -0.119 | |
| | | (1.577) | (0.108) | | | (0.818) | (-0.362) | |
| Log PC Inc 1960 | | | -1.189** | -0.829*** | | | -1.321*** | -0.786*** |
| | | | (-2.355) | (-3.025) | | | (-3.096) | (-2.958) |
| E.As. & Pac. | | | 0.264 | | | | 0.166 | |
| | | | (0.565) | | | | (0.379) | |
| Primary Sch. 1960 | | | 0.00396 | | | | -0.0108 | |
| | | | (0.0352) | | | | (-0.0959) | |
| Inv. Price 1960 | | | -0.0141*** | -0.0102*** | | | -0.0159*** | -0.00823** |
| | | | (-2.680) | (-2.681) | | | (-4.955) | (-2.040) |
| Tropical Area | | | -1.907*** | -1.503*** | | | -1.867*** | -1.021*** |
| | | | (-5.622) | (-4.147) | | | (-4.485) | (-3.077) |
| Coastline Pop | | | 0.341 | | | | 0.204 | |
| | | | (0.679) | | | | (0.409) | |
| Malaria | | | 1.000* | 0.556 | | | 0.970 | |
| | | | (1.852) | (0.976) | | | (1.617) | |
| Life Exp. 1960 | | | 0.115** | 0.0586* | | | 0.127*** | 0.0648** |
| | | | (2.570) | (1.666) | | | (3.126) | (2.262) |
| Conf. | | | 0.00371 | 0.0361*** | | | -0.0218 | 0.124*** |
| | | | (0.0410) | (6.719) | | | (-0.334) | (2.868) |
| SS. Afr. | | | 0.246 | | | | 0.188 | |
| | | | (0.506) | | | | (0.326) | |
| Latin Amer. | | | 0.450 | | | | -0.103 | |
| | | | (0.265) | | | | (-0.0989) | |
| GDP Mining | | | 5.941** | 3.795 | | | 5.916** | 6.139** |
| | | | (2.251) | (1.205) | | | (2.005) | (2.358) |
| Spanish Colony | | | -0.380 | | | | -0.0976 | |
| | | | (-0.352) | | | | (-0.134) | |
| Years Open | | | 1.335 | | | | 1.018 | 0.948* |
| | | | (1.635) | | | | (1.580) | (1.849) |
| Muslim | | | -0.0119 | -0.00640 | | | -0.0147** | |
| | | | (-1.328) | (-1.021) | | | (-2.383) | |
| Buddhist | | | 1.590 | | | | 4.690 | -9.499** |
| | | | (0.152) | | | | (0.657) | (-2.206) |
| Eth. Fractionalization | | | -0.819 | -1.859** | | | -0.979 | -1.448** |
| | | | (-1.056) | (-2.207) | | | (-1.253) | (-2.461) |
| Constant | 2.142*** | -3.596 | 5.841 | 7.287** | 3.200*** | 0.426 | 9.812 | 5.969*** |
| | (2.792) | (-0.937) | (0.488) | (2.374) | (5.518) | (0.137) | (1.285) | (3.304) |
| IV | | Primate Capital, Federal | | | Primate Capital, Federal, Cons Exec, Indep Year | | | |
| No of obs. | 100 | 100 | 62 | 76 | 99 | 99 | 62 | 76 |
| Wald test | | | | 0.18 | | | | 0.43 |
| Hansen's J (p-value) | 0.40 | 0.12 | 0.10 | 0.57 | 0.23 | 0.18 | 0.49 | 0.93 |

Robust z-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table 6b. Growth 2SLS Regressions - COLONY Sample**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | **Dependent Variable: Growth Rate of Real GDP Per Capita (1960-1999 average)** | | | | | | | |
| Soccer | -3.102*** | -5.150** | -2.441 | -3.130*** | -3.679*** | -3.975*** | 0.0963 | -2.510*** |
| | (-2.665) | (-2.283) | (-0.897) | (-2.714) | (-3.913) | (-2.700) | (0.0757) | (-2.792) |
| Govt Cons. | | -0.0427 | -0.00428 | | | -0.0121 | -0.0137 | |
| | | (-0.922) | (-0.0470) | | | (-0.319) | (-0.226) | |
| Openness | | 0.0157 | -0.0270 | 0.0269** | | 0.0129 | 0.0256* | 0.0165** |
| | | (1.040) | (-0.909) | (2.183) | | (1.157) | (1.805) | (1.969) |
| Log Total Pop. | | -0.166 | -0.109 | | | 0.0561 | 0.642** | |
| | | (-0.500) | (-0.206) | | | (0.224) | (2.465) | |
| Log PC Inc 1960 | | | -1.634*** | -1.068*** | | | -0.738** | -0.584** |
| | | | (-2.952) | (-2.764) | | | (-2.456) | (-2.221) |
| E.As. & Pac. | | | 1.487 | 0.721 | | | 1.162*** | 1.256** |
| | | | (1.412) | (1.138) | | | (3.348) | (2.033) |
| Primary Sch. 1960 | | | 0.134 | | | | 0.240 | |
| | | | (0.505) | | | | (1.355) | |
| Inv. Price 1960 | | | -0.0131*** | -0.00934** | | | -0.0115*** | -0.00656 |
| | | | (-5.098) | (-2.365) | | | (-4.696) | (-1.417) |
| Tropical Area | | | -1.967*** | -1.942*** | | | -1.441*** | -1.871*** |
| | | | (-3.744) | (-3.054) | | | (-2.862) | (-3.554) |
| Coastline Pop | | | 0.826 | | | | 0.768* | |
| | | | (1.321) | | | | (1.681) | |
| Malaria | | | 1.006 | | | | 1.260*** | |
| | | | (1.542) | | | | (2.641) | |
| Life exp. 1960 | | | 0.115*** | 0.0664* | | | 0.0555** | |
| | | | (2.684) | (1.699) | | | (2.111) | |
| Conf. | | | -0.366 | 0.0236* | | | 0.0407 | 0.0449*** |
| | | | (-1.599) | (1.700) | | | (0.246) | (6.158) |
| SS. Africa | | | 1.077 | | | | 0.0179 | |
| | | | (1.178) | | | | (0.0325) | |
| Latin Amer. | | | 1.966* | 0.717 | | | 1.549* | 1.114** |
| | | | (1.919) | (1.104) | | | (1.700) | (1.980) |
| GDP Mining | | | 9.421*** | | | | 1.917 | |
| | | | (3.086) | | | | (0.873) | |
| Spanish Colony | | | -0.252 | | | | -0.256 | |
| | | | (-0.522) | | | | (-0.566) | |
| Years Open | | | 0.424 | | | | -0.0653 | |
| | | | (0.420) | | | | (-0.0928) | |
| Muslim | | | -0.00428 | | | | -0.00660 | |
| | | | (-0.524) | | | | (-1.132) | |
| Buddhist | | | 41.94* | | | | -2.108 | |
| | | | (1.724) | | | | (-0.125) | |
| Eth. Fractional. | | | -0.231 | | | | 0.481 | |
| | | | (-0.235) | | | | (0.781) | |
| Constant | 3.094*** | 5.527 | 9.343 | 7.157*** | 3.313*** | 2.471 | -4.562 | 6.890*** |
| | (4.903) | (1.195) | (0.869) | (3.277) | (6.646) | (0.751) | (-0.976) | (3.722) |
| IVs | | Primate Capital, Federal | | | | Primate Capital, Federal, Log Settler Mortality | | |
| No of obs. | 71 | 71 | 42 | 56 | 63 | 63 | 37 | 52 |
| Wald test | | | | 0.10 | | | | 0.11 |
| Hansen's J (p-value) | 0.64 | 0.71 | 0.60 | 0.98 | 0.23 | 0.28 | 0.49 | 0.71 |

## Table 7. Income Level 2SLS Regressions - Decennary Cross-Sections – Full Sample

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Dep. Var: Log Per Capita Income 2000-04** | | | | **Dep. Var: Log Per Capita Income 1990-99** | | | | **Dep. Var: Log Per Capita Income 1980-89** | | | | **Dep. Var: Log Per Capita Income 1970-79** | | | |
| Lagged SOCCER | -5.004** | -6.192** | -4.548** | -6.114 | -5.535** | -6.847* | -4.705* | -4.341 | -6.910*** | -7.555** | -7.553* | -10.26 | -5.460 | -6.403 | -4.434 | -7.013 |
| | (-2.156) | (-2.296) | (-2.211) | (-1.625) | (-1.964) | (-1.748) | (-1.703) | (-1.094) | (-2.802) | (-2.537) | (-1.746) | (-1.155) | (-1.490) | (-0.924) | (-0.856) | (-0.300) |
| Lagged Govt Cons. | | 0.0682** | 0.0155 | 0.0122 | | -0.0316 | -0.0478 | -0.0319 | | -0.00548 | -0.0203 | -0.0344 | | -0.0143 | -0.0869 | -0.148 |
| | | (2.325) | (0.731) | (0.313) | | (-0.569) | (-1.622) | (-0.867) | | (-0.185) | (-0.665) | (-0.681) | | (-0.100) | (-0.977) | (-0.383) |
| Lagged Trade/GDP | | -0.00819 | 0.000654 | -0.00713 | | 0.0117 | 0.0144** | 0.00830 | | 0.00962 | 0.00943 | 0.00751 | | -0.0106 | -0.000676 | -0.0232 |
| | | (-0.905) | (0.0964) | (-0.886) | | (1.203) | (2.076) | (1.149) | | (0.773) | (0.798) | (0.489) | | (-0.417) | (-0.0293) | (-0.263) |
| Lagged Log Tot. Pop. | | -0.205 | -0.231 | -0.468* | | -0.236 | -0.194 | -0.302 | | -0.110 | -0.274 | -0.516 | | -0.0958 | -0.0942 | -0.342 |
| | | (-1.081) | (-1.558) | (-1.772) | | (-0.653) | (-0.916) | (-0.997) | | (-0.433) | (-1.053) | (-0.943) | | (-0.237) | (-0.354) | (-0.243) |
| Ethnic Frac. | | | -1.257** | -0.783 | | | -1.104 | -0.734 | | | -1.391 | -2.687 | | | -1.159 | -1.957 |
| | | | (-2.162) | (-0.768) | | | (-1.590) | (-0.717) | | | (-1.153) | (-0.825) | | | (-1.049) | (-0.375) |
| Lagged Guer War. | | | 0.484 | 0.828 | | | -0.263 | -0.398 | | | 1.005 | 2.046 | | | 0.330 | -0.187 |
| | | | (0.879) | (1.205) | | | (-0.680) | (-1.227) | | | (1.360) | (0.999) | | | (0.643) | (-0.204) |
| Postwar Indep. | | | -0.959*** | -1.030 | | | -0.746** | -0.553 | | | -0.0635 | -1.177 | | | -0.944** | -1.804 |
| | | | (-2.645) | (-1.346) | | | (-2.004) | (-1.214) | | | (-0.0782) | (-1.094) | | | (-2.047) | (-0.391) |
| Oil Producing | | | 0.0886 | -0.191 | | | 0.282 | 0.656 | | | 0.0835 | 0.309 | | | 1.790 | 2.967 |
| | | | (0.186) | (-0.213) | | | (0.523) | (1.252) | | | (0.105) | (0.226) | | | (1.451) | (0.508) |
| Latitude | | | 0.0335*** | 0.0281 | | | 0.0280* | 0.0373** | | | 0.00567 | -0.0233 | | | 0.0274 | 0.0369 |
| | | | (2.613) | (1.247) | | | (1.694) | (2.134) | | | (0.170) | (-0.331) | | | (1.030) | (0.633) |
| Muslim | | | | -0.00125 | | | | -0.0107* | | | | -0.00572 | | | | -0.0282 |
| | | | | (-0.111) | | | | (-1.846) | | | | (-0.365) | | | | (-1.036) |
| Catholic | | | | 0.00243 | | | | -0.00567 | | | | -0.0260 | | | | -0.00637 |
| | | | | (0.267) | | | | (-0.806) | | | | (-1.113) | | | | (-0.427) |
| Protestant | | | | -0.00682 | | | | -0.0145 | | | | -0.0257 | | | | -0.0376 |
| | | | | (-0.610) | | | | (-1.273) | | | | (-1.258) | | | | (-0.342) |
| Hindu | | | | -0.0136 | | | | -0.0105 | | | | 0.184 | | | | |
| | | | | (-0.702) | | | | (-0.561) | | | | (0.997) | | | | |
| Conf | | | | 0.0221 | | | | 0.0145 | | | | -0.0109 | | | | 0.00587 |
| | | | | (1.239) | | | | (1.426) | | | | (-0.615) | | | | (0.159) |
| Latin Am. and Carib. | | | | -0.759 | | | | -0.402 | | | | -0.807 | | | | -1.377 |
| | | | | (-1.122) | | | | (-0.900) | | | | (-0.620) | | | | (-0.393) |
| SS Africa | | | | -0.238 | | | | -0.453 | | | | 0.519 | | | | 1.526 |
| | | | | (-0.190) | | | | (-0.376) | | | | (0.252) | | | | (0.243) |
| South Asia | | | | 0.230 | | | | -0.409 | | | | -0.946 | | | | |
| | | | | (0.147) | | | | (-0.354) | | | | (-0.573) | | | | |
| MENA | | | | 0.490 | | | | -0.541 | | | | -1.449 | | | | 0.482 |
| | | | | (0.491) | | | | (-1.184) | | | | (-1.021) | | | | (0.235) |
| Constant | 10.61*** | 12.75*** | 12.48*** | 16.25*** | 10.75*** | 13.50** | 12.27*** | 13.61** | 11.88*** | 12.87*** | 14.77*** | 22.14* | 11.09*** | 13.15 | 12.31* | 19.54 |
| | (7.338) | (3.432) | (4.310) | (3.205) | (6.299) | (2.089) | (2.989) | (2.241) | (7.646) | (3.074) | (2.741) | (1.685) | (4.841) | (1.341) | (1.694) | (0.471) |
| IVs | | Primate Capital, Federal | | | | Primate Capital, Federal | | | | Primate Capital, Federal | | | | Primate Capital, Federal | | |
| No of obs. | 99 | 98 | 98 | 98 | 96 | 95 | 95 | 95 | 86 | 80 | 80 | 80 | 64 | 61 | 61 | 61 |
| Hansen's J (p-value) | 0.53 | 0.55 | 0.82 | 0.83 | 0.16 | 0.22 | 0.29 | 0.30 | 0.59 | 0.62 | 0.85 | 0.68 | 0.19 | 0.22 | 0.80 | 0.44 |

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Lagged variables refer to the values of the prior decade.

**Table 8. Income Level 2SLS Regressions - Precise SOCCER Observations – Full Sample and Colony Sample**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Dependent Variable: Log Per Capita Income (2000-2004 Average)** | | | | | | | | | | | |
| | **FULL SAMPLE** | | | | | | | | **COLONY SAMPLE** | | | |
| Soccer | -2.670*** | -2.779*** | -3.863*** | -2.737* | -5.252** | -6.626** | -3.222 | -4.210 | -3.553* | -6.212** | -3.732** | -3.694 |
| | (-3.375) | (-3.845) | (-3.705) | (-1.856) | (-2.181) | (-2.503) | (-1.610) | (-1.476) | (-1.874) | (-2.345) | (-2.119) | (-1.463) |
| Govt Cons. | | | | 0.0639 | | 0.0410 | -0.0402 | -0.0433 | | -0.0436 | -0.113 | -0.0878 |
| | | | | (1.357) | | (0.546) | (-0.715) | (-0.735) | | (-0.344) | (-1.342) | (-0.871) |
| Openness | | | | -0.0109 | | -0.00633 | 0.0108 | 0.000221 | | -0.0366 | -0.00133 | -0.00114 |
| | | | | (-0.816) | | (-0.419) | (1.306) | (0.0223) | | (-1.265) | (-0.0753) | (-0.0677 |
| Log Total Pop. | | | | -0.279* | | -0.226 | -0.0566 | -0.363 | | -0.956* | -0.473 | -0.346 |
| | | | | (-1.762) | | (-0.831) | (-0.316) | (-1.290) | | (-1.816) | (-1.620) | (-1.088) |
| Eth. Frac. | | | | | | | -1.384 | -0.584 | | | -0.499 | -0.622 |
| | | | | | | | (-1.543) | (-0.543) | | | (-0.402) | (-0.373) |
| Postwar Indep. | | | | | | | -0.839* | -0.935 | | | -0.858* | -1.066 |
| | | | | | | | (-1.844) | (-1.012) | | | (-1.960) | (-1.027) |
| Guer. War | | | | | | | 0.378 | 0.270 | | | 0.00484 | -0.336 |
| | | | | | | | (0.580) | (0.302) | | | (0.00716) | (-0.439) |
| Oil Prod. | | | | | | | 0.477 | 0.566 | | | 0.689 | 0.866 |
| | | | | | | | (0.659) | (0.809) | | | (1.208) | (1.416) |
| Latitude | | | | | | | 0.0428*** | 0.0544** | | | 0.0514** | 0.0631** |
| | | | | | | | (2.794) | (2.378) | | | (2.118) | (2.448) |
| Muslim | | | | | | | | -0.0118 | | | | -0.0120 |
| | | | | | | | | (-1.250) | | | | (-0.898) |
| Catholic | | | | | | | | -0.00682 | | | | 0.00103 |
| | | | | | | | | (-0.703) | | | | (0.0503) |
| Protestant | | | | | | | | -0.0235* | | | | -0.0428 |
| | | | | | | | | (-1.894) | | | | (-1.135) |
| Conf. | | | | | | | | 0.0149 | | | | |
| | | | | | | | | (1.129) | | | | |
| Latin Amer. | | | | | | | | -0.478 | | | | -1.070 |
| | | | | | | | | (-0.814) | | | | (-0.624) |
| SS. Africa | | | | | | | | -0.192 | | | | 0.0414 |
| | | | | | | | | (-0.175) | | | | (0.0347) |
| MENA | | | | | | | | 0.0574 | | | | -0.578 |
| | | | | | | | | (0.0827) | | | | (-0.602) |
| Constant | 10.44*** | 9.348*** | 11.00*** | 12.60*** | 10.59*** | 13.10*** | 9.802*** | 14.12*** | 8.953*** | 21.52*** | 14.68*** | 14.28*** |
| | (23.78) | (20.14) | (25.08) | (4.583) | (8.761) | (3.161) | (3.440) | (3.099) | (8.574) | (2.939) | (3.584) | (2.619) |
| Estimation | OLS | OLS | 2SLS | 2SLS | 2SLS | 2SLS | 2SLS | 2SLS | 2SLS | 2SLS | 2SLS | 2SLS |
| IV | | | Const. on the Exec. | | | Primate Capital, Federal | | | | Primate Capital, Federal | | |
| First stage F-stat. | | | 19.12 | 19.12 | 9.74 | 9.74 | 9.74 | 9.74 | 13.56 | 13.56 | 13.56 | 13.56 |
| Soccer known years | 40 | ≥30 | 40 | 40 | ≥30 | ≥30 | ≥30 | ≥30 | ≥30 | ≥30 | ≥30 | ≥30 |
| No of obs. | 25 | 64 | 25 | 25 | 64 | 64 | 64 | 64 | 43 | 43 | 43 | 43 |
| Adj. R-squared | 0.27 | 0.14 | | | | | | | | | | |
| Hansen's J (p-val) | | | Exactly Identified | | 0.32 | 0.27 | 0.56 | 0.47 | 0.50 | 0.19 | 0.59 | 0.54 |

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1