

On the size of nations: Theory and evidence

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Abstract

This paper studies the equilibrium size of countries. Individuals in small countries have greater influence on the nature of political decision making while individuals in large countries have the advantage of more public goods and lower tax rates. The model implies that (i) an exogenous increase in public spending decreases country size; (ii) countries with a presidential regime are larger than countries with a parliamentary regime. This last prediction is consistent with cross-country data.

Key Words: country size, public spending, structure of government.

JEL Numbers: D7, H1, H2, H7.

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1 Introduction

Political instability and border redrawings are quite common. Examples are former republics like the Soviet Union, Yugoslavia, and Czechoslovakia or the Basques in Spain and the Kurds in Iraq and its surroundings. The number of countries has increased significantly in the last century, from 62 in 1914 to 193 at present.¹ This increase is induced partly by decolonization but also in Europe, for example, the number of countries increased from 32 to 48. Another development is the significant increase in public spending, as a share of GDP as well as in absolute terms: public spending rose from 10,7% around 1870, 27,9% in 1960 to 45,6% in 1996 for a group of 17 industrial countries. These figures include redistribution but also government real expenditure, defined as the sum of government salaries and supplies purchased by the government, increased from 4,6% around 1870, 12,6% in 1960 to 17,3% in 1995.²

Border changes and the equilibrium number and size of nations are studied in the seminal contribution by Alesina and Spolaore (1997, 2003). In their research, country formation is the result of a specific trade-off between the benefits of larger political entities and the costs of heterogeneity in larger communities. The benefit of living in larger countries is that the fixed costs of having a government can be spread over more individuals, while individuals in smaller countries have more influence on their government.³ The increase in public spending mentioned above thus increases

¹See *The Economist*, January 3, 1998, pp.63-65.

²The data on public spending come from Tanzi and Schuknecht (2000), Table I.1 and Table II.1.

³Hotelling's (1929) location model representing the heterogeneity of voters over the provision of public goods is also used by Le Breton and Weber (2001), Casella (1992), Casella and Feinstein (1990), Cremer et al. (1985), Goyal and Staal (2003) and Feinstein (1992). For a more

the incentives to form larger countries, which contradicts the increase in countries observed in the same period. Since the benefits of having a government are not fixed in the model of this paper, as they are in Alesina and Spolaore's research, the increase in public spending does not lead to a conclusion which contradicts the increase in the number of countries mentioned above.

One of the core assumptions of the Alesina and Spolaore (1997) model is thus that the benefits and the costs of public goods are assumed to be fixed, i.e. they do not depend on country size. Alesina and Wacziarg (1998), however, present empirical evidence that total public spending of a country increases with country size. Although the results of Alesina and Spolaore generalize when public spending increases linearly with country size, the benefits of public spending remain constant. This leads to the anomaly that the benefits of a good neither increases with the amount of the good nor with the resources used to provide these goods. Another implication of the fixed benefits and fixed costs assumptions is that if the increase in public spending mentioned above is modeled as an increase in fixed costs, the equilibrium size of countries will increase. This contradicts the increase in the number of countries mentioned at the start of the introduction. In my analysis I therefore assume that total public spending as well as the payoff from public spending increases with the size of a country.

Alesina and Wacziarg (1998) show that public spending increases less than proportionally with country size. In my model the per capita costs of government therefore decreases with country size and the payoff of government is increasing in

extensive discussion of some of this literature see Bolton et al. (1996).

country size, since larger countries spend more on public goods than small countries. I use unidimensional spatial modeling of the heterogeneity of citizens' preferences among voters concerning the provision of public goods. This makes it possible to study two more topics which cannot be studied using fixed costs and fixed benefits assumptions. Firstly, I examine the effect of the previously mentioned massive increase in public spending on the equilibrium size of countries. Secondly, I investigate how institutions for public good provision, i.e. how presidential regimes and parliamentary regimes, affect country size.

The main results in this paper are the following. Equilibrium country size depends on the balance between the diminishing marginal returns of country size on the one hand and the increasing political costs on the other hand. An increase in public spending decreases the equilibrium size of countries and I argue that the equilibrium size of countries with parliamentary regimes is smaller than the equilibrium size of countries with presidential regimes. Finally, I present empirical evidence consistent with these predictions. I discuss these results in more detail below.

Intuitively, an exogenous increase in public spending can have two opposite effects. On the one hand, more public spending and thus a higher payoff from public spending makes it more important for individuals to locate the public good nearby, inducing a smaller equilibrium size of countries. On the other hand, an increase in public spending makes it more important to share the costs over a larger number of individuals, thus inducing a greater equilibrium size of countries. Beforehand, it is not obvious which effect will prevail. I show that an exogenous increase in public spending has a negative effect on equilibrium country size. This effect is on the

one hand created by the diminishing marginal benefits of public spending and on the other hand by the increase in the importance of the transportation costs. More public spending implies that the marginal benefits are lower, which means that the decrease in total public spending when country size decreases becomes less important. Moreover, more public spending also implies that it becomes more important to have a type of public good relatively similar to the most preferred type, which is more likely to happen in smaller countries. These results are consistent with the increase in public spending and the decrease in average country size mentioned at the beginning of the introduction.

In a presidential regime, there is a clearer separation of legislative and executive power than in a parliamentary regime. Based on a spatial model I show that the greater separation of the legislative and the executive power in a presidential regime implies that public spending is smaller under presidential regimes. Since I also find that an increase in public spending has a negative influence on country size, this implies that the equilibrium size of countries with parliamentary regimes is smaller than the equilibrium size of countries with presidential systems. Persson et al. (2000) give empirical evidence that public spending is smaller under presidential regimes than under parliamentary regimes and I present a novel cross-country data set showing that countries with a parliamentary regime are indeed smaller.

In the remainder of the paper I start with discussing the model and its assumptions in Section 2. Section 3 studies the equilibrium outcome, discusses the effects of an increase in public spending and the influence of forms of government on country size. Section 4 discusses the empirical evidence and Section 5 concludes.

2 Model

In the model, there is a trade-off between the benefits of large countries and the accompanying costs of heterogeneity in large populations. Larger political jurisdictions bring about several benefits. Firstly, the per capita costs of several public goods decrease with the size of the population. Secondly, more public goods are provided in larger countries. Lastly, exposure to uninsurable shocks is more costly for smaller countries. The counterbalancing effect of increasing the size of political jurisdictions is that individuals have less influence on the type of public goods.

In order to keep the model tractable, I consider only one public good (type of government, public service), which identifies each country. The public good identifies a bundle of administrative, judicial and economic services and other public policies. I consider only a single dimension along which the different possible types of public goods are distributed. This dimension stretches from minus infinity to plus infinity. I assume that there is a world population with ideal points distributed evenly along the same dimension. Individuals' utility decreases with the distance of their government from their ideal point. Distance can be interpreted in a geographical and in a preference dimension. In the former interpretation, utility decreases with distance since individuals further away from the government have higher transportation costs. In the latter interpretation, utility decreases with distance since the type of public goods provided differs more from the most preferred type.

Every country has a single government and the citizens of each country of size s have to pay a positive lump-sum tax $t(s)$ to finance public goods provision by the government. In accordance with the findings of Alesina and Wacziarg (1998), total

public spending $st(s)$ increases less than proportionally in country size, and the other assumptions regarding $t(s)$ stated below are also consistent with their findings.

$$(A1) \quad \left\{ \begin{array}{ll} t(s) > 0 & \forall s \\ \frac{d}{ds}t(s) < 0 & \forall s \\ \left(\frac{d}{ds}\right)^2 t(s) > 0 & \forall s \\ \frac{d}{ds}st(s) > 0 & \forall s \\ \lim_{s \rightarrow \infty} \frac{d}{ds}t(s) = 0 & \end{array} \right.$$

The assumption for the limit of $\frac{d}{ds}t(s)$ is used to ensure the existence of equilibriums. The maximum payoff from total public spending $st(s)$ is denoted by $g(st(s))$ and satisfies the following assumptions.

$$(A2) \quad \left\{ \begin{array}{ll} \frac{d}{ds}g(st(s)) > 0 & \forall s \\ \left(\frac{d}{ds}\right)^2 g(st(s)) < 0 & \forall s \\ \text{Inada :} & \lim_{s \rightarrow 0} \frac{d}{ds}g(st(s)) = \infty \\ & \lim_{s \rightarrow \infty} \frac{d}{ds}g(st(s)) = 0 \end{array} \right.$$

The assumptions imply that public goods are normal: the maximum payoff of the goods increases with country size (since total spending increases with country size), but the marginal increase diminishes for larger countries. In addition, I assume that $g(st(s))$ satisfies Inada-type conditions to ensure the existence of equilibriums.

The loss in utility that an individual suffers when the type of government is far from his preferred type is measured by the positive parameter a . The preference distance of individual i to his government is denoted by $d(i)$ and the size of the coun-

try individual i lives in is denoted by s_i . Every individual has the same exogenous income y . The utility of individual i thus is

$$U_i = g(s_i t(s_i)) - a g(s_i t(s_i)) d(i) + y - t(s_i)$$

In these type of models, individuals who are close to each other in terms of preferences clearly prefer to form a country together, and only countries that are connected emerge. Finally, I define a rule governing secession and determining the equilibrium size of countries: individuals on the border of a country are free to abandon their country and join a neighboring one.

I now discuss two examples of public goods or types of government along with the model. As a first example, consider monetary policy. An individual benefits from living in a larger jurisdiction with a single currency since its money is used more widely. The distance costs, however, are that the monetary policy in a large jurisdiction probably differs from the one preferred by this individual while the costs of monetary policy decreases with the size of the jurisdiction, reflecting economies of scale. As a second example, consider the machinery of a government. Larger jurisdictions have larger machineries, which is advantageous, but an individual also has to travel further to the point where the government is located. As long as the number of civil servants increases less than proportionally with country size, the per capita costs decline in country size. In the first example, the model is interpreted in a preference dimension, while in the second example the interpretation is geographical.

3 Analysis

In an equilibrium, country size is such that individuals at the border between countries are indifferent between both countries. This implies that country size is determined by the following trade-off faced by the individuals at the border. On the one hand, the transportation costs increase when an individual joins a larger country. On the other hand, there are more public goods and lower taxes in this country. This results in the following proposition.

Proposition 3.1 *The equilibrium size \hat{s} of countries is implicitly given by*

$$\frac{1}{2} \frac{d}{ds} ag(\hat{s}t(\hat{s})) = \frac{d}{ds} g(\hat{s}t(\hat{s})) - \frac{d}{ds} t(\hat{s}).$$

Proof of Proposition 3.1. An individual at the boundary of a country might join another country, but the individual will not do this if his payoff decreases when he moves to the neighboring country. The individuals at the border have the largest incentives to do so, since for them the changes in distance costs are smaller. An individual at the border will not move from a country of size s to a country of size s' when

$$g(st(s)) - \frac{1}{2} asg(st(s)) - t(s) > g(s't(s')) - \frac{1}{2} as'g(s't(s')) - t(s').$$

This can be rewritten as

$$\frac{1}{2} as'g(s't(s')) - \frac{1}{2} asg(st(s)) > g(s't(s')) - g(st(s)) - (t(s') - t(s)).$$

When $s' > s$ this is equivalent to the following

$$\frac{\frac{1}{2}as'g(s't(s')) - \frac{1}{2}asg(st(s))}{s' - s} > \frac{g(s't(s')) - g(st(s))}{s' - s} - \frac{t(s') - t(s)}{s' - s} \quad (1)$$

and taking the limit of s' approaching s gives:

$$\frac{1}{2}a\frac{d}{ds}sg(st(s)) > \frac{d}{ds}g(st(s)) - \frac{d}{ds}t(s) \quad (2)$$

For $s' < s$ the inequality signs of (1) and (2) will reverse.

By assumption, $\frac{d}{ds}g(st(s)) - \frac{d}{ds}t(s)$ is decreasing in s and $\frac{1}{2}a\frac{d}{ds}sg(st(s))$ is increasing in s . $\frac{1}{2}a\frac{d}{ds}sg(st(s)) = \frac{d}{ds}g(st(s)) - \frac{d}{ds}t(s)$ thus has a unique solution. ■

Individuals thus face a trade-off between transportation costs versus more public goods and less taxes. These transportation costs are denoted by $\frac{1}{2}a\frac{d}{ds}ag(st(s))$ while public goods and taxes are in the terms $\frac{d}{ds}g(st(s)) - \frac{d}{ds}t(s)$.

3.1 Increase in public spending

In the last 60 years the absolute level as well as the relative share of public spending has increased remarkably. In this subsection I will investigate the influence of this increase on country size. Assume that the lump sum tax level an individual in country i has to pay is $\hat{\beta} + t(s_i)$, where $\hat{\beta} > 0$ denotes the increase in public spending. It is easy to verify that this new tax level does not affect the assumptions on $g(\cdot)$ and $t(\cdot)$ specified in Section 2.

From Proposition 3.1 it follows that the equilibrium size s of countries under

majority voting is given by

$$\frac{1}{2}ag\left(s\left(\hat{\beta}+t(s)\right)\right)=\frac{\partial}{\partial s}g\left(s\left(\hat{\beta}+t(s)\right)\right)-\frac{\partial}{\partial s}\left(\hat{\beta}+t(s)\right)$$

An increase in $\hat{\beta}$ will decrease the equilibrium country size s since changes in $\hat{\beta}$ and in s have similar effects on $\frac{1}{2}ag\left(s\left(\hat{\beta}+t(s)\right)\right)$ and $\frac{\partial}{\partial s}g\left(s\left(\hat{\beta}+t(s)\right)\right)-\frac{\partial}{\partial s}\left(\hat{\beta}+t(s)\right)$.

From the above it follows that the equilibrium country size decreases due to an increase in public spending. I formalize this in the following Proposition.

Proposition 3.2 *Higher levels of public spending negatively affect the equilibrium country size.*

This results from two effects. In the first place, an increase in public spending leads to an increase in the importance of the distance costs. These costs are represented by $\frac{1}{2}ag\left(s\left(\hat{\beta}+t(s)\right)\right)$. More public spending thus induces greater incentives to decrease the distance to the public good. In the second place, an increase in public spending decreases the marginal rise in payoff from an increase in country size. This is represented by $\frac{\partial}{\partial s}g\left(s\left(\hat{\beta}+t(s)\right)\right)-\frac{\partial}{\partial s}\left(\hat{\beta}+t(s)\right)$. Higher public spending levels decrease the marginal rise in the maximum payoff of the public good $\frac{\partial}{\partial s}g\left(s\left(\hat{\beta}+t(s)\right)\right)$, not altering the marginal change in the tax level $\frac{\partial}{\partial s}\left(\hat{\beta}+t(s)\right)$.

3.2 Parliamentary and presidential regimes

In this section I study how a political regime influences the public good provision and how this affects the equilibrium size of nations. The first political system is a parliamentary regime, where there is a single vote for both the executive and

legislative power. In a presidential regime, there are two separate votes, one for the executive and one for the legislative power. The decision making process in a parliamentary regime is modeled as the election of a so-called citizen candidate. In referenda the individuals in a country can choose between two candidates and the candidate who ultimately prevails will determine both the amount and the type of the public good provided by the country. Decision making in a presidential regime is modeled with two referenda. In the first referendum the type of the public good is determined while in the second referendum the individuals decide on the level of public good provision. Note that for the result presented in Proposition 3.3 we do not need the sets of assumptions (A1) and (A2): it is sufficient is that the payoff from public spending $g(\cdot)$ is a concave function.

In the model of a parliamentary regime individuals in each country thus elect a representative who will determine the amount of public spending as well as the location of the government. The elected candidate locates the government at his ideal point and chooses the level of public spending (and thus the tax level) to maximize his own payoff. Hence, each candidate will set the same level of public spending if elected. Candidates thus differ only in where they will locate the government. Clearly, the individual in the middle of the country is thus the only candidate which cannot be beaten in an election with two candidates. The elected candidate thus maximizes the following with respect to the tax level $t(s)$.

$$g(st(s)) + y - t(s)$$

The elected candidate therefore equalizes his marginal benefit of public spending

with his marginal costs of public spending, that is $g'(st(s)) = 1/s$.

Now consider a presidential regime. The median voter theorem implies that in a referendum on the type of the public goods, individuals decide to locate the public goods in the middle of their country. It then follows that the median voters for the level of public good provision are located at $1/4$ and $3/4$ of a country. Half the individuals (the individuals between $1/4$ and $3/4$) have smaller distance costs and therefore want to provide more public goods, while half the individuals have larger distance costs and therefore want to provide fewer public goods. For a given country size s the two median voters choose a tax level $t(s)$ to maximize the following.

$$g(st(s)) - \frac{1}{4}asg(st(s)) + y - t(s)$$

The two median voters therefore equalize their marginal benefit of public spending with their marginal costs of public spending, that is $g'(st(s))/(1 - \frac{1}{4}as) = 1/s$.

For a comparison of public good provision under both regimes first note that in both cases the public good will be located in the middle of the country. Secondly, we draw this comparison for the case with given country sizes s^* , and then look separately at countries with parliamentary regimes and with presidential regimes. The condition for the amount of public goods in a parliamentary regime can be rewritten as $g'(s^*t(s^*)) = 1/(s^*(1 - \frac{1}{4}as^*))$. Since $(1 - \frac{1}{4}as^*)/s^* < 1/s^*$ and since $g'(\cdot)$ is a decreasing function in its argument the following proposition holds.

Proposition 3.3 *In a parliamentary regime more public goods are provided than in a presidential regime.*

Under a presidential system fewer public goods are provided since there is greater separation of the legislative and executive powers. There are separate elections for both, making it possible that the preference of the decisive voter regarding the type of the public good diverges from the preference of the decisive voter on the amount. In a parliamentary regime, however, there is a single election for both powers. Hence, there does not exist a conflict interest between the executive and legislative power, leading to a higher level of public good provision.

Now consider the influence that the type of regime has on the equilibrium size s of countries. Combining the results of Propositions 3.2 and 3.3 gives the following.

Proposition 3.4 *The equilibrium size of countries with parliamentary regimes is smaller than the equilibrium size of countries with presidential regimes.*

The intuition behind this result is as follows. Since there are fewer public goods provided under a presidential regime, individuals have smaller incentives to influence the type of these goods, so countries with a presidential regime tend to be larger.

4 Empirical evidence

The theory developed in the previous sections generates clear predictions on how country size is affected by several variables. Are these predictions supported by empirical evidence? In this section, I present an answer, based on findings in other studies and on a novel cross-country data set of 112 countries.

Increase in public spending

Proposition 3.2 predicts that *the size of nations decreases when there is an exogenous increase in the amount of total spending*. The higher total spending is, the more important it is to exert influence on the type of public goods provided, and the latter implies that the equilibrium size of nations is smaller. During the 20th century, there has been a significant increase in public spending, for a discussion see Tanzi and Schuknecht (2000). There are external factors explaining this increase in public spending, for example the increase in economic openness, so this increase is (at least partly) exogenous. Rodrik (1998), for example, argues that openness induces a larger susceptibility to external shocks and that open countries therefore need a larger public sector to provide a stabilizing role. Rodrik (1998) and Alesina and Wacziarg (1998) also present empirical evidence that openness and government spending are indeed positively related. Even though other factors might have played a role, like decolonization or democratization, the increase in the number of nations (and thus a decrease in the size of nations) in the 20th century is consistent with the predictions of the theory presented in this paper.

Not just the amount, but also the composition of public spending has changed in the 20th century. Tanzi and Schuknecht (2000) show that the increase in total public spending has much to do with an increase in spending on social security. A welfare state has large bureaucratic costs and thus exhibits economies of scale, and the per capita costs decrease with population size. With the rise of the welfare state in the 20th century, economies of scale in public good provision has thus become more important. In the model of Alesina and Spolaore (1997), this would lead to

an increase in the size of nations. Country size has, however, decreased and this is in line with the theory presented in this paper. As spending on for example social security increases, individuals want to live in smaller jurisdictions so they can exert more influence on the type of social spending.

Parliamentary and presidential regimes

Proposition 3.3 predicts that *more public goods are provided in parliamentary than in presidential regimes*. In a parliamentary regime, the institutional setup produces more legislative cohesion and less separation of powers than in a presidential regime and can therefore provide more public goods. This result can also be obtained in different setups and with different models, Persson et al. (1997, 1998, 2000) and Persson and Tabellini (1999) derive similar results. In their models, three important factors play a role: the abuse of power by policymakers; preference heterogeneity among individuals; and disagreement between political representatives. Even though the setup of these models is thus different, the entailing intuition behind their results is roughly similar. Moreover, based on cross-country evidence, Persson et al. (2000) and Persson and Tabellini (1999) present strong and robust support for the prediction that the size of government is smaller under a presidential than under parliamentary regimes.

Proposition 3.4 predicts that *countries with parliamentary regimes are smaller than countries with presidential regimes*. Countries with a parliamentary regime have more public spending, making it more important for individuals to exert influence on the type of public spending. This implies that the equilibrium size of countries with a parliamentary regime is smaller. To check whether this prediction is supported by

empirical evidence, I use a novel cross-country data set with 112 nations.

According to the theory, country size depends on the type of regime. For an empirical analysis, one thus has to classify the institutions of nations and find a measure for country size. In the presentation of the model in section 2, I argue that there are two possible interpretations of the model: one interpretation focuses on preferences, the other on geography. In the first, distance costs are caused by the difference between the preferred and implemented policy, in the second by travel expenditures. For the first interpretation, a sensible way to measure the size of nations is by the size of population, while in the second interpretation, the size of countries can be measured by area. I base the measures of the dependent variable, country size, on the entries *Population* and *Area*⁴ in the *CIA World Factbook 2004*.⁵

In section 3.2, I argue that the difference between countries with parliamentary and presidential regimes is whether there is a substantial separation of powers between different political actors, with regard to decisions on the amount and type of public spending. In a parliamentary system, the executive power stems from a legislative body, while this is not the case in a presidential system. The primary source for classifying countries in parliamentary and presidential is the *CIA World Factbook 2004*. The entries *Executive branch* and *Legislative branch* give detailed information on the connection between the two.

In a presidential democracy, there are thus separate direct elections for the chief of state who has the power to form the executive power and direct election for a

⁴Land area, the aggregate of all surfaces delimited by international boundaries and/or coastlines, excluding inland water bodies (lakes, reservoirs, rivers).

⁵Available online: <https://www.cia.gov/library/publications/the-world-factbook/>

legislative body (e.g. in the United States of America with the presidential elections and elections for the Congress). In a parliamentary democracy, there are direct elections for a legislative body, but only indirect elections, by this legislative body, to form the executive power (e.g. in the United Kingdom with parliamentary elections). Obviously, it is difficult to classify the variety of political institutions in parliamentary-presidential categories, and using other definitions might yield other classifications. The classification presented in Table 1 is, however, based on data that have no connection with the other variables in the analysis. Yet, further investigation can be made in a more extensively elaborated classification.

Elections, however, are not free and fair in all countries. In China and Iran, for example, not every citizen is eligible to be elected into the legislative body. The degree of democratization thus obviously is a factor one has to take into account in this analysis. To measure the degree of democratization, I use the *Political Rights rating* from the *Freedom in the World 2004* survey of *Freedom House*.⁶ The rating lies between 1 and 7 for each country, with 1 being the most free and 7 the least free.

There is a second reason to include a measure of democracy in the empirical analysis. In their theoretical work, Alesina and Spolaore (1997, 2003) argue that dictators prefer large empires to small countries since they can extract larger total rents from larger populations. Democratization, however, shifts the trade-off between size and heterogeneity, resulting in the breakup of existing empires. Even though a proper test of such a hypothesis would require a time-series analysis, I maintain that it can also be tested with cross-country data, assuming that empires that have become

⁶Available online: <http://www.freedomhouse.org/>

Parliamentary Regime	Presidential Regime
Country	Country
Australia	Algeria
Austria	Armenia
Bangladesh	Azerbaijan
Belgium	Belarus
Bulgaria	Bolivia
Burkina Faso	Brazil
Cambodia	Burundi
Canada	Cameroon
China	Central African Rep.
Croatia	Chile
Czech Republic	Colombia
Denmark	Costa Rica
East Timor	Côte d'Ivoire
Egypt	Dominican Republic
Estonia	Ecuador
Ethiopia	El Salvador
Finland	Georgia
France	Ghana
Germany	Guatemala
Greece	Guinea
Hungary	Honduras
India	Indonesia
Ireland	Jordan
Israel	Kazakhstan
Italy	Kenya
Jamaica	Kyrgyzstan
Japan	Madagascar
Laos	Mali
Latvia	Mauritania
Lesotho	Mexico
Lithuania	Morocco
Malaysia	Mozambique
Mauritius	Namibia
Moldova	Nicaragua
Mongolia	Niger
Nepal	Nigeria
Netherlands	Panama
Norway	Paraguay
Pakistan	Peru
Papua New Guinea	Philippines
Poland	Romania
Portugal	Russia
Slovakia	Rwanda
Slovenia	Senegal
South Africa	Sierra Leone
Spain	South Korea
Sweden	Sri Lanka
Switzerland	Tajikistan
Thailand	Tanzania
Turkey	Tunisia
Ukraine	Turkmenistan
United Kingdom	Uganda
Vietnam	United States
	Uruguay
	Uzbekistan
	Venezuela
	Yemen
	Zambia
	Zimbabwe

Table 1: Regime type.

	log(area)	log(population)
constant	3.687 ** (5.019)	6.106 ** (9.451)
presidential	0.268 * (1.843)	-0.033 (-0.260)
political rights	0.105 ** (2.481)	0.078 ** (2.106)
log(GDP per capita)	0.335 * (1.975)	0.230 (1.538)

(t-statistics are in parantheses)
*: significant at 10%; **: significant at 5%
number of observations: 112

Table 2: Regression outcomes.

more democratic have already fallen apart due to this democratization (e.g. the Soviet Union or Yugoslavia). I thus test an additional prediction, that *democracies are smaller than dictatorships*.

A control variable that is often used in other cross-country studies is GDP per capita (see, for example, Rodrik 1998, Persson et al. 2000 or Persson and Tabellini 1999). Therefore, I also include log of GDP per capita in the analysis, using data from CIA World Factbook 2004 on GDP per capita on purchasing power parity basis.

Table 2 reports the regression analysis based on the sample of 112 countries using ordinary least squares estimation. The dependent variables are log(area) and log(population). The estimated coefficient for the presidential dummy (1 if there is

	log(area)	log(population)
constant	3.912 *** (4.563)	5.680 *** (7.825)
presidential	0.555 *** (2.769)	0.371 ** (2.187)
log(GDP per capita)	0.295 (1.427)	0.330 * (1.881)

(t-statistics are in parantheses)
*: significant at 10%; **: significant at 5%; *** significant at 1%
number of observations: 69

Table 3: Regression outcomes.

a presidential regime) is positive and significant at the 10% significance level when country size is measured by log(area) and the estimated coefficient for Political Rights is positive and significant at the 5% level when country size is measured by log(area) and log(population). These estimates thus provide evidence for the predictions made by theory.

The parliamentary-presidential classification is based on whether the executive stems from the legislative. In dictatorial regimes, however, this classification may have less meaning. Table 3 therefore presents the regression results when we restrict the sample to 69 countries with a score 1 to 3 on the political rights ranking, thus excluding dictatorships such as Vietnam or China, but still including Nicaragua and Paraguay. The estimated coefficient for the presidential dummy then is positive and

significant at the 5% level in case country size is measured by $\log(\text{population})$ and significant at the 1% level in case $\log(\text{area})$ is used. This analysis thus provides strong evidence for the prediction that countries with a presidential regime are larger than countries with parliamentary regime.

5 Concluding remarks

This paper studies the equilibrium size of countries: in small countries individuals have a greater influence on the nature of political decision making while in larger countries individuals benefit from lower taxes and higher public good levels. The extension of the Alesina and Spolaore (1997) framework, making amounts and payoffs of public spending depend on country size, allows to study the relationship between country size and changes in the amounts of the public goods that are provided. I argue that an exogenous increase in public spending decreases the equilibrium size of countries, and that the equilibrium size of countries with a presidential regime is larger than that of countries with a parliamentary regime. Public spending is higher in countries with parliamentary regimes than in countries with presidential regimes. Influence on the type of spending is therefore more important for individuals living under parliamentary regimes, and these countries therefore tend to be smaller. I also discuss empirical evidence that supports the above predictions.

The analysis of this paper can be extended in different directions. One possible direction would be to study other rules determining country size. Bordignon and Brusco (2001) discuss secession rules, and different secession rules obviously can

lead to different outcomes. Another direction would be to look at the incentives dictators have to provide public goods. These incentives for public good provision in a dictatorship also have an impact on the equilibrium size of nations. Finally, the analysis has implications for the design of political institutions. This poses hard -but fascinating- research questions, normative questions about the optimal design of political institutions and positive questions about the development of these institutions.

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