Segregation and the quality of government in a cross-section of countries

Alberto Alesina and Ekaterina Zhuravskaya*
Harvard University and New Economic School, Moscow

July 2008

Abstract

This paper has three goals. The first, and perhaps the most important, is to provide a new compilation of data on ethnic, linguistic and religious composition at the sub-national level for a large number of countries. This data set allows us to measure segregation of different ethnic, religious and linguistic groups within the same country. The second goal is to correlate measures of segregation with measures of quality of the polity and policymaking. The third is to construct an instrument that helps to overcome the endogeneity problem that arises because groups move within country borders, partly in response to policies. Our results suggest that more ethnically and linguistically segregated countries, i.e., those where groups live more spatially separately, have a substantially lower quality of government. In contrast, we find no relationship between religious segregation and the quality of government.

1 Introduction

Racial and religious conflicts are often associated with poor politico-economic performance, especially in developing countries. Economists have recently turned their attention to ethno-linguistic fractionalization as an explanation of differences in the pace of development, starting with an influential paper by Easterly and Levine (1997). Since then, many others have shown how fractionalization is negatively correlated with a host of policy variables, such as the quality of government, indices of development, etc.[1] However, many ethnically diverse countries (the United States, for instance) are quite successful. What makes

*We are grateful to Denis Chetverikov and Anna Savelyeva for excellent research assistance. We also thank Roman Schibli, Artem Dzuba, and Galina Besstremiannaya for help with data collection.

[1] See Alesina and La Ferrara (2005) for a survey. For quality of government in particular, see La Porta et al. (1999). Alesina and Glaeser (2004) show that redistributive policies are less extensive in more fractionalized countries.

different countries more or less capable of handling diversity or even of benefitting from it remains an open question.[2]

Due to lack of data, existing cross-country literature has never considered the issue of segregation: that is, two hypothetical countries with, for example, two equally sized groups would have the same fractionalization index (1/2) regardless of how the groups are distributed geographically within the country, from complete segregation (e.g., one group living in the northern half of the country and the other in the southern half) to total integration (i.e., the members of the groups are uniformly distributed throughout the country); yet one should expect outcomes to vary with segregation.

The purpose of this paper is to fill this gap. More specifically, our contribution is threefold: first and perhaps most importantly, we present a new data set on the composition of ethnic, linguistic and religious groups at the sub-national (regional) level for a large number of countries (97 for ethnicity, 92 for language, and 78 for religion).[3] These data allow us to compute both an index of fractionalization and an index of segregation at the national level, as well as an index of fractionalization at the sub-national level. We find that the level of segregation varies vastly across countries and the national-level fractionalization is often different from subnational fractionalization. Second, we recognize that, at least up to a point, the geographical distribution of groups is endogenous to policy choices: populations move in response to national and local policies as well as economic shocks. To cope with the endogeneity of segregation, we suggest and compute an instrument based upon the composition of major groups in bordering countries. More specifically, we construct an index of predicted segregation based on the idea that if the home country has a group that is also present in a neighboring country, this group is likely to be concentrated near the border of the two countries. Conversely, if the home country has a group not present in any of the neighboring countries, that group is likely to be distributed uniformly. Third, we relate our index of segregation to measures of the quality of government. We find that, controlling for fractionalization at the national level and for the level of development, higher segregation in terms of ethnicity and language is associated with significantly lower quality of government. The negative effect of ethnic and linguistic segregation is especially large in democracies. In contrast, there is no relationship between religious segregation and the quality of government.

There are several possible and non-mutually-exclusive explanations for this finding. One is that, if groups choose to live separately, they feel more animosity towards each other and they disagree more on how to conduct public policies, leading to a deterioration of the quality of government. Alesina, Baqir and Easterly (1999) provide a model that relates the extent of disagreement among individuals and the quality of their public policies. They show that the more distant the preferences of different individuals and groups over public policies, the lower the quality of the latter. Geographical concentration of ethnic groups

[2] For some discussion of whether democracy and/or development helps, see Alesina and La Ferrara (2005).

[3] The precise definition of linguistic versus ethnic groups is given below.

may also exacerbate "ethnic voting" (i.e., different ethnicities voting for candidates who represent their group, regardless of their quality). This effect would hold only in democracies, and Banerjee and Pande (2007) show evidence from India that ethnic voting reduces the quality of politicians. In some cases, geographical segregation may also lead to a threat of secession, putting additional stress on the central government, which may then have to spend additional resources on appeasement or repression rather than on productive public goods and local governance.[4] Geographical separation of groups may also exacerbate conflicts over allocation of public goods across regions and their financing by identifying the beneficiaries of local public goods in terms of different ethnic groups.

We are not aware of other papers on segregation in a cross-section of countries, since data on this variable have not been assembled. There is, of course, a vast literature on segregation in US cities, which focuses on three issues: i) measures of segregation (see Echenique and Fryer (2008) for a recent important contribution), ii) explanations for the evolution of segregation (see, for instance, Cutler, Glaeser and Vigdor (1999) and the references cited therein) and iii) the effect of segregation on the socioeconomic performance of minorities (for early contributions, see Kain (1968); for more recent contributions, see Jenks and Meyer (1990), Kain (1992), Cutler and Glaeser (1997) and Cutler, Glaeser and Vigdor (2008)). There has been little research on the effects of segregation on the quality of government. An exception is La Ferrara and Mele (2006). They consider the effect of racial segregation in US cities (Metropolitan Statistical Areas) and find that more racial segregation has a positive impact on average public school expenditure but leads to more inequality of school spending across school districts.

The present paper is organized as follows: Section 2 describes the data on group composition at the sub-national level that we have assembled. Section 3 discusses the construction of indices of segregation using these data. Section 4 presents the correlations between segregation measures and the quality of government. Section 5 presents our instrument for segregation and the results of instrumental variables estimation of the effect of segregation on the quality of government. Section 6 discusses the robustness of the results; and the last section concludes.

2 Data

We construct three data sets with ethnic, linguistic and religious composition of sub-national administrative units (regions) in each country. We apply the classification of groups used in Alesina et al. (2003), a paper that has produced a widely used data set for fractionalization at the national level. That paper extends the "traditional" ethno-linguistic fractionalization index based upon the *Atlas Narodov Mira*, used by Easterly and Levine (1997) and many other authors since, into its ethnic and linguistic components by focusing not only

[4] See Alesina and Spolaore (2003) for a discussion of secession threats and military spending.

on linguistic differences but also on other pertinent differences between relevant groups. Alesina et al. (2003) construct one index based exclusively on language and another that combines a classification of language, self-reported ethnicity, and physical features, primarily skin color.[5]

In most cases, people identify with a particular ethnic group based only upon the commonality of their mother tongue; in these cases, ethnic and linguistic groups coincide. In some countries, however, the use of separate classifications for language and ethnicity produces different levels of diversity. Consider the US: according to a linguistic classification, whites and African Americans would belong to the same group, but according to the ethnic index they would not, since their skin colors are different. These two criteria make a lot of difference in other parts of the world as well. For instance, some Latin American countries (e.g., Brazil and Ecuador) are much more homogeneous in terms of language than in terms of ethnicity. This is because different ethnic groups such as whites, mulattos and blacks speak the language of former colonizers (i.e., the Spanish or Portuguese).

In the present paper, we consider the same three dimensions of diversity as in Alesina et al. (2003): i) ethnicity, for which we have 97 countries, ii) language, for which we have 92 countries, and iii) religion, for which we have 78 countries. The median number of groups is six for ethnicity and five for language and religion. The maximum number of groups within a country is 55 for ethnicity, 34 for language and 13 for religion. Note that each group is treated identically; we make no attempt to measure the "distance" between groups (i.e., the degree of difference between different languages, ethnicities, physical features or religions).[6]

Our geographical unit of observation is a region, i.e., a sub-national administrative unit of each country. For each region, we collected data on the total population size and the fraction of the population that belongs to a certain linguistic, ethnic or religious group. We drew data from the Census closest to the year 2000 whenever its results were available. The second source of data we turned to whenever census data were unavailable is the statistics published by the national statistical offices of the countries. If neither of these two sources were available, we relied on the regionally-representative Demographic and Health Surveys (*www.measuredhs.com*). For the vast majority of countries, at least one of these three sources was available. In a few cases, however, we had to rely on the results of published demographics research. Table A.1 in the Appendix describes in detail the data sources.

The quality of data available for the regional composition of groups varies by country. Interestingly, it is often the case in this data set that data are "better" for developing than for developed countries. For example, some countries in

[5] They use skin color to identify groups in the ethnicity component whenever this information is available. When data on skin color are unavailable, groups are identified according to self-identification of people into particular ethnic groups. By using additional sources, they also expand on the number of countries in the *Atlas*. As data sources, they used the *Encyclopaedia Brittanica* and the *CIA Factbook*.

[6] See Spolaore and Wacziarg (2007) on this question.

Western Europe after WWII deliberately do not ask questions about ethnic identity in their censuses. Therefore, we had to rely on information about the birthplace of naturalized migrants and citizenship of non-naturalized migrants to proxy for ethnic composition. We have classified countries into "high" and "low" data quality (12 countries got a "low" score for quality of data on ethnicity; 3 for language and only one for religion). The results do not vary much between the sample which includes all countries and the sample with high-quality data only.

The first consistency check on our data is as follows. For each country, we started with our regional data and aggregated them to the national level. We constructed the Herfindahl index of fractionalization at the national level for each country i and for each dimension of diversity, i.e., ethnicity, language, and religion. The Herfindahl index captures the probability that two randomly drawn individuals in a certain country belong to different groups and is equal to:

$$F^i = \sum_{m=1}^{M^i} \pi^i_m (1 - \pi^i_m)$$

where i indexes countries; m indexes groups and M^i is the total number of groups in the country i. π^i_m is the fraction of group m in the country i. Then, we compared the resulting indices to the corresponding indices compiled by Alesina et al. (2003) directly from the national-level data. The correlation between the indices from the two data sources is very high. For language and ethnicity, correlation coefficients are above 0.9, and in the case of the high-quality samples, they are 0.97. For religion, the correlation coefficients are slightly lower for both samples: namely, about 0.84.

Using our data, we can compute fractionalization indices of different regions within countries. For each region j of country i we calculate the Herfindahl indices of fractionalization (F^i_j) based upon our three dimensions of diversity. The formula for regional-level fractionalization is as follows:

$$F^i_j = \sum_{m=1}^{M^i} \pi^i_{jm} (1 - \pi^i_{jm})$$

where i indexes countries (as above); j indexes regions; and π^i_{jm} stands for the fraction of group m in region j of country i.

In the data there is no obvious pattern in the relationship between national-level and regional-level fractionalization indices. In some countries regional-level fractionalization indices do not differ much from national-level fractionalization. Of course, this is the case in very homogenous countries, such as Ireland and Costa Rica in terms of linguistic composition. But, this also happens in very fractionalized countries, such as Australia in terms of religion, where national fractionalization is 0.77, whereas regional fractionalizations range from 0.72 to 0.78 with a standard deviation (SD) of only 0.02. Another example is Bolivia, which has an ethnic national fractionalization of 0.74 and regional fractionalization indices ranging from 0.59 to 0.73 with an SD of 0.04. In other countries, national fractionalization turns out to be a lot higher than all regional fractionalizations, in other words, regions turn out to be a lot more homogenous than the whole country. For example, national-level linguistic fractionalization in Nigeria is 0.42, while the largest regional fractionalization is only 0.22. Finally, it is often also the case that a country has relatively small national fractionalization, but some regions within it are very fractionalized. For example, in Colombia the national linguistic fractionalization is 0.06 while regional fractionalization is 0.5 in Amazonas and Vichada regions ("departments"); similarly, the national religious fractionalization in Indonesia is 0.2, while regional fractionalization indices are about 0.6 in the West Kalimantan and Maluku provinces. The great diversity of the observed patterns suggests that the national-level fractionalization index is hardly a sufficient statistic to describe diversity within countries.

3 Indices of Segregation

Based on information on the group composition in sub-national regions, we construct an index of segregation which assumes a value of 1 if each group occupies a separate region and therefore each region is fully homogeneous, even though the country as a whole is fractionalized. The index assumes a value of 0 if each region has the same composition as the country as a whole.

Reardon and Firebaugh (2002) derive, summarize, and compare several alternative indices of segregation. Based on their analysis, we define our baseline index of segregation for country i as follows:

$$S^i = \frac{1}{M^i - 1} \sum_{m=1}^{M^i} \sum_{j=1}^{J^i} \frac{t^i_j}{T^i} \frac{(\pi^i_{jm} - \pi^i_m)^2}{\pi^i_m}$$

where T^i is the total population of country i and t^i_j is the population of region j in country i. J^i is the total number of regions in country i. The rest of the notation is as above. In particular, π^i_m is the fraction of group m in country i, and π^i_{jm} is the fraction of group m in region j of country i. To avoid cluttering from now on, we drop the superscript i that indicates the country.

If each region is comprised of a separate group, then the index is equal to 1, and this is the case of full segregation. If every region has the same fraction of each group as the country as a whole, the index is equal to 0, and we take this as the case of no segregation. S is increasing in the square deviation of regional-level fractions of groups relative to the national average. It is usually referred to as the "squared coefficient of variation." The index gives higher weight to the deviation of group composition from the national average in bigger regions than in smaller regions. Scaling by the total number of groups keeps the index between 0 and 1.

S is defined for the full set of M groups. One important consideration in applying this formula to the data relates to how to classify the "other" category:

that is, in many regions of many countries, a certain share of the population is not classified (i.e., classified as "other"). There are different ways of treating the group (or non-group) "other." The simplest but least appropriate would be to treat this group as any of the identified groups. This is not satisfactory precisely because the classification of "other" captures tiny groups or mixed groups. If the group "other" were a clearly identifiable homogenous group, it would most likely be classified as such.

An alternative is to assume that the group "others" is composed of a number of distinct and small subgroups O that data availability does not permit us to properly classify. Assume also that there is no segregation within the "other" category, i.e., the subgroups of the "other" category are uniformly distributed across all regions. Denote the number of identified groups by N. Then, under these assumptions, one can rewrite the formula for the segregation index S as follows:

$$\widehat{S} = \frac{1}{N+O-1}\left(\sum_{m=1}^{N}\sum_{j=1}^{J}\frac{t_j}{T}\frac{(\pi_{jm}-\pi_m)^2}{\pi_m} + S_o\right)$$

where

$$S_o = \sum_{j=1}^{J}\frac{t_j}{T}\frac{(\pi_{jo}-\pi_o)^2}{\pi_o}$$

π_o is the fraction of "others" in the whole population and π_{jo} is the fraction of others in the region j. Thus, in this case, the segregation index is equal to the sum of the two components – the segregation among identified groups and the segregation of the "other group" treated as a single group (S_o) – divided by the total number of groups ($N+O$) minus one.[7]

In order to calculate $\widehat{S}$, one needs to assess the number of subgroups within the "other" category (O). It is reasonable to assume that none of the subgroups in "others" is larger than the smallest group that is explicitly classified. Thus, we set the number of "others" subgroups O equal to the number of people in "others" divided by the size of the smallest identified group. The rationale is clear: the assumption is that the individuals who are not explicitly classified into groups are those who belong to tiny groups that are "missed" by the census or the national statistical office precisely because they are small.[8]

Another approach would be to simply ignore the group "other" altogether and redefine the index of segregation for the N groups not defined as "other." In this case, segregation could be measured as follows:

$$\widetilde{S} = \frac{1}{N-1}\sum_{m=1}^{N}\sum_{j=1}^{J}\frac{t_j}{T}\frac{(\pi_{jm}-\pi_m)^2}{\pi_m}$$

[7] If one were to treat "others" as a single homogenous group, the segregation index S would be equal to $\frac{N}{N+O-1}\widehat{S}$.

[8] To get rid of a few outliers in terms of the number of subgroups of "others" (O), we cut off the distribution of O across countries at the 95th percentile, i.e., we redefine O to be equal to the 95th percentile of the distribution of O across countries when it is larger than the 95th percentile of this distribution.

Note that, under the assumptions underlying the distribution of "others," the index $\widehat{S}$ is a theoretically correct definition of segregation. In contrast, the index $\widetilde{S}$ is an approximation, since we are ignoring a certain share of the population defined as "other."[9]

Let us now describe how these indices of segregation apply to the actual data. The first thing to note is that the two indices $\widehat{S}$ and $\widetilde{S}$ are very highly correlated: 0.96 – for ethnicity, 0.80 – for language, and 0.86 – for religion. Figure 1 shows the scatter plots of the two indices of segregation (i.e., $\widetilde{S}$ and $\widehat{S}$) for each of the three dimensions of diversity. As one would expect, ethnic and linguistic segregation indices are highly correlated; in fact, by construction, they are identical in 46 countries. These are the countries in which people identify with ethnic groups on the basis of language differences. Correlation between segregation by language or ethnicity, on the one hand, and by religion, on the other, is substantially lower, albeit also positive. (Figure 2 plots the segregation indices by ethnicity, language, and religion against each other.) Countries appear to be more segregated in terms of ethnicity and language than in terms of religion. Segregation ranges from 0 to 0.39 in terms of ethnicity with a mean value of 0.10 and from 0 to 0.49 with a mean of 0.11 in terms of language; whereas religious segregation ranges from 0 to 0.27 with a mean of 0.05 (all according to $\widehat{S}$). As shown in Figure 3, the indices of segregation are positively correlated with the indices of fractionalization at the national level for ethnicity and language (with pairwise correlation coefficients of 0.42 and 0.36, respectively) and uncorrelated for religion (with a correlation coefficient of 0.01).

The most striking fact about segregation across countries is its relationship with the level of development. Poor countries are on average twice as segregated as rich countries in terms of all three dimensions of diversity. The mean value of ethnic segregation is 0.11 for countries with per capita GDP below Slovenia, which is often considered to be the poorest rich country; in contrast, the mean of ethnic segregation is 0.04 for countries with per capita GDP above or equal to Slovenia; for linguistic segregation the corresponding figures are 0.12 vs. 0.07; and for religious segregation – 0.05 vs. 0.02. The very few rich countries which are ethnically highly segregated are Spain, Belgium, Israel and Switzerland and none of them are among the ten most segregated countries. Arguably, three of the four of these countries face the most difficult ethnic conflicts within the developed world. The most religiously segregated rich countries are the Netherlands, Israel, and Japan and their rank among all countries is below 17. It would appear that the ability or willingness to reduce segregation is increasing in GDP per capita. Correlation coefficients of log per capita GDP with ethnic, linguistic, and religious segregation are −0.35, −0.23, and −0.31, respectively. Controlling for per capita GDP and fractionalization (both of which are correlated with segregation, as we point out), Latin American countries are on average the most ethnically and linguistically segregated and the least segregated in terms of religion. Interestingly, there are no significant differences in

[9] Since $\sum_{m=1}^{N} \pi_m \neq 1$ and $N < M$, both the numerator and the denominator in $\widetilde{S}$ are smaller than in S.

the level of segregation between Africa and Asia. Transition countries are less segregated than non-transition countries in terms of ethnicity and language, while they do not differ terms of religious segregation.

Table 1 shows the most and the least segregated countries along with their segregation and fractionalization coefficients. In the Appendix, we report summary statistics for segregation indices (Panel A of Table A.2), and the table of correlations between different indices (Table A.3).[10]

4 Correlation: Segregation and Governance

We now look at the correlation of our measures of segregation with what are, by now, standard measures of the quality of government, namely, the World Bank's Governance Indicators: Voice and accountability, Political stability, Government effectiveness, Regulatory quality, Rule of law, and Control of corruption. The data, detailed definitions and sources for each of these variables are presented at http://www.govindicators.org (see also Kaufmann, Kraay, and Zoido-Lobaton 1999, 2002 and Kaufmann, Kraay, and Mastruzzi 2006).

Different governance indicators are very highly correlated with each other. Therefore, it is virtually impossible to disentangle different dimensions of the quality of government in a cross-section of countries. Throughout the analysis we carry all six governance indicators with us, knowing well, however, that each one of them is not truly an independent observation. In Table 2, we present pairwise correlation coefficients between the quality of government indicators and our six measures of segregation ($\widehat{S}$ and $\widetilde{S}$ for language, ethnicity and religion). All of the correlation coefficients are negative, and their magnitude is quite high (i.e., more segregation, lower quality of government); in some cases, correlation exceeds 0.5 in absolute value. This is not surprising, however, considering that the quality of government goes hand-in-hand with the level of development and the level of fractionalization.

Therefore, we are primarily interested in establishing whether segregation is associated with governance conditional on fractionalization and the level of development. To study partial correlations, we run simple OLS regressions of the following form:

$$Q_i = \alpha + \beta S_i + \gamma F_i + X_i'\delta + \varepsilon_i$$

where i indexes countries, Q stands for a governance indicator; S and F are segregation and fractionalization indices, respectively; X is a vector of additional covariates (described below); and ε is a heteroscedastic error. We run these regressions separately for the three dimensions of diversity: ethnicity, language, and religion.

In Table 3, we present results for the rule of law as dependent variable and $\widehat{S}$ as the measure of segregation. First, consider regressions in which the

[10] To conserve space, in each of these tables, in addition to the indices of segregation we summarize the instruments used for these indices. The instruments are described below in the Section 5.

right-hand side includes only the indices of segregation and fractionalization (the results are presented in columns (1), (3) and (5)). For all dimensions of diversity, the index of segregation in these regressions enters negatively with the coefficient statistically different from 0, at least at the 5% level of confidence. The index of fractionalization is also negative and significant in regressions for ethnic and linguistic diversity, while it is positive and marginally significant for religion. The results on fractionalization are in line with findings by Alesina et al. (2003). Religious affiliation can be "forced" upon individuals. In many countries, religious freedom is limited or non-existent, and therefore, a high level of religious homogeneity is artificially imposed by law, and this may especially be the case in "bad" forms of government.[11]

Columns (2), (4) and (6) add a set of regressors standard in the literature (e.g., La Porta et al. 1999 and Treisman 2000). The most important one is, of course, log of GDP per capita, since measures of institutional development and government quality are highly correlated with per capita income. We also control for log population size, democratic tradition, and two geographical variables: latitude (a common control for adverse climate conditions) and a measure of the extent to which country's surface is covered by mountains. We added mountains to the list of covariates because, on the one hand, the level of segregation may depend on physical constraints to mobility and, on the other hand, harsh terrain may make government policies less effective. We also add legal origin dummies to the list of controls following the insights by La Porta et al. (1999). Finally, in order to capture Weberian ideas, we control for the shares of main religions in the population (see, for instance, La Porta et al. 1997). Definitions of control variables, their sources, and summary statistics are reported in Tables A.2 and A.4.

Ethnic and linguistic segregation continues to be negatively (and significantly, at the 1% level) associated with the rule of law after the inclusion of control variables (columns (2) and (4)); whereas the coefficient on religious segregation becomes small and statistically insignificant. Fractionalization loses significance in all regressions with control variables. It is, in particular, the inclusion of GDP per capita that makes the index of fractionalization insignificant in this regression, a result consistent with La Porta et al. (1999). Note, however, that whether or not one wants to control for GDP per capita in these types of regressions is debatable, since per capita income may be endogenous to ethnic fractionalization and segregation. In any case, our index of segregation remains significant even after controlling for GDP per capita. As for the control variables, with the exception of GDP per capita and democratic tradition, none of the controls is statistically significant consistently across regressions; the legal origin variables, however, are jointly significant. Figure 4 illustrates the relationship between segregation indices and the rule of law with residual scatter plots conditional on all covariates.

In Tables 4 and 5, we report abbreviated results of the same regressions as in

[11] The same problem may apply to forced linguistic and ethnic assimilation, but it is less common.

Table 3 for all the quality of government indicators. We show the results for the segregation indices $\widehat{S}$; the OLS results for $\widetilde{S}$ are almost identical and available upon request. Each table has three panels. The first two panels report results of regressions with all control variables (Panel A) and with fractionalization and segregation indices as the only regressors (Panel B). Panel C presents results for a subset of countries which excludes dictatorships, defined as countries with an average Polity IV democracy score less than one for the years 1975-2004.[12]

Not surprisingly, the pattern of results obtained for the rule of law in Table 3 generalizes to all the other quality of government indicators. Let us discuss ethnic and linguistic diversity first. Fractionalization is significant only in regressions without control variables. In contrast, measures of linguistic and ethnic segregation have a statistically significant negative coefficient in regressions both with and without controls. There are a couple of exceptions: in the full sample with all controls, coefficients on segregation are insignificant for regulatory quality for both ethnicity and language and for government effectiveness for ethnicity. In the sub-sample of democracies, the results on ethnic and linguistic segregation are stronger: the coefficients are larger in absolute value while standard errors are approximately the same as in the full sample. The coefficients on segregation in the sub-sample of democracies are statistically significant in regressions for all governance indicators. The result that segregation is more strongly associated with the quality of government in the sample of democracies does not depend on the definition of democracy.[13]

As for the case of religious diversity, religious segregation is not associated with any measures of the quality of government once control variables are included; whereas coefficients on religious fractionalization are positive and in approximately one half of regressions statistically significant. In section 6, we discuss the robustness of our results with respect to excluding influential observations and including additional covariates that may affect both segregation and the quality of government.[14]

---

[12] The Polity IV democracy score is the *democ* variable taken from www.systemicpeace.org/inscr/p4v2006.xls.

[13] For example, the results are just as strong for the substantially more restrictive definition of democracy adopted in Persson and Tabellini (2003).

[14] An alternative measure of segregation that we came across is a so-called "relative diversity": $R = \frac{1}{F}\sum_{m=1}^{M}\sum_{j=1}^{J}\frac{t_j}{T}\left(\pi_{jm}-\pi_m\right)^2$. The relationship between R and S is as follows. Define segregation of a particular group m as $S_m = \sum_{j=1}^{J}\frac{t_j}{T}\frac{\left(\pi_{jm}-\pi_m\right)^2}{\pi_m}$. Then, $R = \sum_{m=1}^{M}\omega_m^R S_m$ and $S = \sum_{m=1}^{M}\omega_m^S S_m$, where $\omega_m^R = \frac{\pi_m}{1-\sum_{k=1}^{M}{\pi_k}^2}$ and $\omega_m^S = \frac{1}{M-1}$. If groups are equal in size, $R = S$ because $\omega_m^S = \omega_m^R$. If groups have different sizes, R gives a higher weight to segregation of larger groups, whereas S gives equal weight to segregation of all groups. Correlation of segregation measures based on the formula for R with the quality of government is negative but much weaker than that of S. This has a theoretical underpinning: segregation in smaller groups has an important effect on the quality of government by means of affecting the relationship between minorities and majorities. This effect is ignored in R. In the rest of the paper, we focus on S as a measure of segregation.

5 Causal Inference: the Effect of Segregation

5.1 Description of the instrument

The level of segregation depends upon where people live, and this choice is endogenous to politico-economic forces. Certainly, major events like civil wars, revolutions or large regional economic shocks may lead to massive migrations. People may also move in response to more "minor" events, such as changes in the level of local taxation or public goods (Tiebout 1956). How much people actually move in response to changes in local policies can be debated. For example, in many developing countries, individuals face serious economic barriers to mobility. If the quality of government (and, in particular, rule of law) is very low at the national level, ethnic and religious groups may choose to live closer together to provide local public goods such as security, order, and socioeconomic infrastructure in a more homogeneous environment with higher social capital. This gives rise to a reverse causality going from the quality of government to segregation.

We propose and compute an instrument for segregation which relates spatial distribution of groups in a country to the composition of major groups present in neighboring countries. In a nutshell, we make a prediction about the location of people belonging to each group in each country, assuming that people belonging to a particular group "gravitate" towards the borders of countries that are populated by people from the same group. Based on the predicted location of members of each group, we construct an index of predicted segregation, which we use as an instrument for the actual segregation.

The idea behind predicting the location of groups is as follows: If a particular group in the home country is also present in one of the neighboring countries, it is likely that this group will live closer to the border with the country populated by the same group. Conversely, if a group in the home country is not present in any of the neighboring countries, it is less likely to concentrate near any particular border and, therefore, will be spread more uniformly across the country. Note that this could be due to a natural historical formation of borders cutting across large areas populated by a particular ethnic or religious group (e.g., the border drawn between Austria and Italy after WWI that left a German-speaking population in the Tyrolean part of Northern Italy). This could also be due to a gradual spread out of a particular language or religion across borders (e.g., adopted from colonizers or missionaries). But it also could be due to an awkward drawing of borders that split groups into two adjoining countries (e.g., in many African states).[15]

An example in Figure 5 illustrates the basic logic of the instrument. Consider a home country $HC1$ with four groups, A, B, C and D. Suppose that this

[15] See MacMillan (2003) for an excellent discussion of this kind of problem created by the 1919 Treaty of Versailles, which redesigned the world's borders after WWI. The idea of a "wrong" border splitting an ethnic group into two neighboring countries underlies the empirical work on "artificial states" by Alesina, Easterly and Matuszeski (2006). We discuss the relationship between our instrument and various measures of "artificial states" in detail in section 6.

country has four neighboring countries, all fully homogeneous and populated by each one of the four groups. The predicted segregation of $HC1$ would be 1, since each of the four groups of the home country would cluster near the border of the neighboring country populated by the same group. Consider now another home country $HC2$ with the same groups but surrounded by four countries without any members of groups A, B, C or D. In this case, the predicted segregation of the home country would be 0, since the four groups in the $HC2$ have no "gravitation" to any of the borders.

The procedure for calculation of the predicted segregation index is as follows. Let the home country have K neighboring countries, assume that it is divided into K hypothetical regions. We construct a predicted distribution of people into these hypothetical regions, assuming that members of each group "gravitate" towards those regions that border countries where their own group constitutes a larger share of the population. Finally, we calculate the predicted index of segregation on the basis of this predicted distribution and use it as an instrument for segregation. Note that the "size" of a hypothetical region is its population share, and since the segregation index does not depend on population density, the borders of these K hypothetical regions are inconsequential.

The calculation of predicted distribution takes several steps. First, we match all groups in each home country to the "major" groups in the neighboring countries. The question of which groups in two neighboring countries "match" is often not so simple. We have adopted a mechanical procedure based upon the definition of groups.[16] We defined a "major" group as a group with size greater or equal to 10% of the country's population. "Major" groups are unlikely to be formed due to cross-border migrations from the home country. Thus, our focus on the major groups corrects for the possibility of relatively small cross-border migrations and makes the instrument less likely to be contaminated by the policies of the home country. The key assumption required for excludability of our instrument is that the quality of government in the home country does not affect major groups in the neighboring countries. Obviously, a state collapse leading to a massive cross-border migration would cause problems for our instrument, but this is a very rare event.

As the second step, we construct the predicted distribution of groups in the home country across hypothetical regions. Let t_{mk} be the number of people from group m predicted to be located in the hypothetical region k of the home country. If none of the neighboring countries has group m as one of its major groups, people from group m are divided equally among all hypothetical regions. Formally,

$$t_{mk} = \pi_m^{HC} T^{HC} \frac{1}{K}$$

where π_m^{HC} is the fraction of group m in the home country; T^{HC} is the home country's total population; and K is the total number of neighboring countries and, thus, of hypothetical regions. In the case when at least one of the

[16] Yet even the most mechanical "matching" procedure in some countries calls for judgment.

neighboring countries has group m as a major group, we predict the following distribution:

$$t_{mk} = \pi_m^{HC} T^{HC} \frac{\pi_m^k}{\sum_{j=1}^{K} \pi_m^j} \tag{1}$$

where π_m^k is the fraction of group m in the neighboring country that borders hypothetical region k. Therefore, $\frac{\pi_m^k}{\sum_j \pi_m^j}$ has a simple interpretation of the force of gravity, which is increasing in the fraction of group m in the neighboring country k relative to the fractions of group m in the other neighboring countries. It is easy to see that if fractions of group m in all neighboring countries are the same, the predicted number of people from group m will be the same in each region. If only one neighboring country has group m among its major groups, the whole group m of the home country is predicted to be located in the hypothetical region bordering this country. Note that we ignore the neighboring countries with population smaller than one hundredth of the size of the home country on the grounds that they should have little gravity. This eliminates from the calculation such neighboring states as San Marino for Italy, Liechtenstein for Switzerland, and Andorra for Spain.

Figure 6 illustrates how the predicted distribution of groups across hypothetical regions is constructed using the example of the religious composition of Switzerland. Switzerland has Catholic, Protestant, Muslim, Jewish, and non-religious populations. It has borders with France, Germany, Austria, Italy, and Liechtenstein. Since Liechtenstein is too small to have any gravity force, we divide Switzerland into four hypothetical regions, i.e., F, G, A, and I named after the first letter of the respective (large enough) neighboring country. Germany is the only country neighboring Switzerland with Protestants as a major religious group; therefore, we predict all of the Switzerland's protestant population (37% of the total population) to be located in the region G. Italy, Austria, and France have sizable not religious populations, while the share of non-religious population in Germany is below 10% and, therefore, it is not a major group. Thus, we predict that the non-religious population of Switzerland will be divided between regions I, A, and F according to the relative shares of non-religious populations in Italy, Austria, and France (5% of the total population in region I, 3.5% in region A, and 3% in region F). We predict Catholics to be located in all four hypothetical regions, as they form a major group in all the neighboring states. Region I is predicted to have the largest number of Catholics because the fraction of Catholics in Italy is higher than in the other neighboring countries. Since Muslims, Orthodox Christians, and Jews do not form a major group in any of Switzerland's neighbors, we predict members of these groups to be located in all hypothetical regions in equal proportions.[17]

[17] In Section 6, we discuss the robustness of our results to alternative assumptions behind the construction of predicted distribution of groups across hypothetical regions.

The outlined procedure yields a predicted distribution of groups among hypothetical regions, which has, however, an important undesirable property. The population size of the individual hypothetical regions is not restricted in any way (apart from the fact that the sum of regional populations equals the population of the home country). As a result, in some countries, predicted population of some hypothetical regions may be very small and uniform. This happens when a tiny group s of the home country is matched to a major group in one of the neighboring countries k and no other group from the home country is matched to any other group in the neighboring country k, at the same time, all other groups in the home country are matched with groups in other neighboring countries. In this case, the segregation index on the basis of this predicted distribution will be very high because the tiny group s will be the only group in the hypothetical region k and it will be perfectly segregated so that no other hypothetical region will have members of group s.

In reality, regions are sufficiently large that none of the tiny groups can form a homogenous region and segregation of tiny groups does not have a large effect on the segregation indices. Thus, we introduce a lower bound to the population size of hypothetical regions. We postulate that the share of the population of any hypothetical region cannot be smaller than the average of the shares of the smallest real regions across countries, namely, 2.7% of the total country's population. Therefore, as the next step, we augment the predicted distribution of groups across hypothetical regions. If a hypothetical region has a predicted size smaller than the lower bound, we "re-settle" people from other hypothetical regions that are bigger than the threshold to this region proportionally so that each person in the sending regions has equal probability to be "re-settled." In other words, we increase the population of the smallest region to reach the lower bound, so that the populations of all bigger regions decrease, but the fractions of different groups in each of these other regions remains constant. If none of the hypothetical regions have predicted population less than the critical value, we do not augment the predicted distribution. The number of countries in which "re-settlement" occurs is: 18 for ethnicity; 19 for language; and 10 for religion. The median number of hypothetical regions with too small populations is 1 for ethnicity and religion and 3 for language; the mean number is between 2 and 3 for all dimensions of diversity. Finally, we calculate the predicted segregation indices $\widetilde{S}$ and $\widehat{S}$ using the resulting predicted distributions. For all countries which have no neighbors, e.g., islands, or have just one neighbor, e.g., Portugal and Denmark, we set $\widetilde{S}$ and $\widehat{S}$ to be zero, as our logic predicts the distribution of all groups to be uniform. The indices of predicted segregation are summarized in Panel C of Table A.2.

Does predicted segregation have the power to predict actual segregation? Table A.3 presents unconditional pairwise correlations between segregation indices and the instruments: they are always positive and range between 0.3 and 0.6. However, in order for predicted segregation to serve as an instrument for the actual segregation, it has to have sufficient predictive power conditional on all covariates. Table 6 reports the results of the first stage regressions of the form:

$$S_i = \alpha + \beta S_i^p + \gamma F_i + X_i'\delta + \varepsilon_i$$

where S_i^p is a measure of predicted segregation. Panel A presents first stage results for $\widehat{S}$ and Panel B for $\widetilde{S}$. For both measures of segregation, $\widehat{S}$ and $\widetilde{S}$, the instrument is a strong (and significant) predictor of the actual segregation. The instrument has a higher predictive power for index $\widehat{S}$ than for $\widetilde{S}$. Figure 7 shows residual scatter plots of the predicted versus actual segregation conditional on covariates (the measure used for the plots in the left column is $\widehat{S}$ and in the right column – $\widetilde{S}$). The last two columns in each of the panels of Table 6 report F-statistics for the excluded instrument (S_i^p).[18] They are sufficiently high for $\widehat{S}$. In the case of $\widetilde{S}$, in some regressions the instrument is weak; particularly, this is the case for the linguistic diversity. This happens because of one outlier - the US. The US is the only country for which the predicted segregation is equal to one (in the case of linguistic diversity), as the Spanish-speaking population is predicted to reside next to Mexico, while the English-speaking population is predicted to reside next to Canada (the only two countries bordering the US by land). We address the problem of weak instrument for $\widetilde{S}$ in Section 6.

5.2 Results

In Tables 7, 8, and 9, we present the results of the second stage regressions for $\widehat{S}$. These tables are organized in the same way as OLS tables 3, 4, and 5, respectively. Table 7 displays the full regression output for the rule of law outcome in regressions with all controls and with no controls except for fractionalization. As with OLS, in 2SLS regressions, the coefficient on segregation is negative and significant at the 5% level in the second stage for ethnicity and language when all controls are included, whereas religious segregation is insignificant. Table 8 shows that ethnic and linguistic segregation has a negative significant effect on all governance indicators without exception in the sample of democracies, and with just a couple of exceptions (voice for ethnicity; and regulatory quality and control of corruption for language) in the full sample. The effect of religious segregation disappears once control variables are included in contrast to the effects of ethnic and linguistic segregation. Figure 8 illustrates the second stage relationship with residual scatter plots.

To understand the size of the effect of segregation on governance, consider the example of linguistic diversity. In the full sample, a move from perfect linguistic segregation to a perfect intermix, which is equivalent to a change of about 9 standard deviations (SD's), leads to improvements in the indices of political stability of about 3 points (= 3.4 SD's), voice of 2.5 points (= 2.6 SD's), the rule of law of about 2 points (= 2 SD's), and government effectiveness of 1.6

[18] We report these F-statistics calculated both under the assumption of heteroscedastic and homoscedastic ε, even though the latter is certainly an incorrect assumption. The reason for reporting both is that the theory of weak instruments, which generated the cut off points for the weak instruments, is developed only for the homoscedastic case (see, for instance, Stock et al. 2002).

points (= 1.6 SD's). The effect of ethnic segregation is a little higher for all governance indicators, with the exception of voice. In addition, in the sample which excludes autocracies, the magnitude of the effect of ethnic and linguistic segregation is larger than in the full sample for all governance indicators with the exception of political stability index. The magnitude of coefficients on ethnic and linguistic segregation in the 2SLS regressions is consistently higher than that of OLS. This could be due both to the endogeneity of segregation and to measurement error.

All the 2SLS results that we have described are for $\widehat{S}$ measure of segregation. For ethnic and religious dimensions of diversity, the results of the second stage are very similar both in terms of magnitude and statistical significance when we consider $\widetilde{S}$ instead of $\widehat{S}$. For linguistic diversity, however, the results of the second stage in the case of $\widetilde{S}$ are weaker in terms of statistical significance with the same magnitude of coefficients. The main difference is as follows: segregation is significant for three instead of four outcomes (voice, political stability, and the rule of law). The results for $\widetilde{S}$ are available from the authors.

6 Sensitivity

In this section, we investigate the robustness of our results.

6.1 Artificial states

Our main identification assumption, i.e., exclusion restriction, is as follows: the predicted segregation calculated based on information on group composition of neighboring states is unrelated to home country outcomes (and, particularly, the quality of government) other than through its relationship with the home country's actual segregation. Yet, one could argue that in many African countries, borders were drawn by colonizers without paying much attention to the historical location of different ethnic groups and some of these borders cut right across them (Alesina et al. 2006). On the one hand, as Alesina et al. (2006) argue, this colonizer's disregard to the local conditions must have had a direct effect on such country's outcomes as government quality. On the other hand, it is also related to predicted segregation, as it yields a situation in which the same ethnic group resides in the two neighboring countries.

We conduct several exercises to verify that our results do not depend on so-called "artificial states." In particular, we try to control directly for the measures of artificial borders suggested by Alesina et al. (2006). The first measure of artificial borders is a measure of how straight the country border is (note that many African countries have borders which are straight lines). The variable is described in detail in Alesina et al. (2006). This variable is uncorrelated with either actual or predicted segregation. Our results are unaffected by the inclusion of this control variable (both in terms of magnitude and statistical significance of the effect segregation and the predictive power of the instrument).

The second measure of artificial borders used by Alesina et al. (2006) is the share of the home country's population which belongs to ethnic groups also represented in neighboring countries which are likely to form the same nation. Alesina et al. (2006) "match" ethnic groups across borders just as we do in order to construct our instrument. There is one important difference in our approach and that of Alesina et al. (2006). While matching groups across borders they make a judgement on whether a certain group present on both sides of a border can potentially make a single nation, e.g., they do not consider groups having the same skin color or the same language in Latin America as the same group. Our approach to matching groups across borders is a more mechanical one and we match groups across borders on the basis of all available characteristics. Thus, in order to check whether our results are driven by the presence of "artificial states" we conduct two additional tests. First, we control for the second measure of artificial borders constructed by Alesina et al. (2006). Alternatively, we control for the share of ethnic, linguistic, and religious populations that match across borders according to our own "mechanical" criterion. Note that in addition to truly "artificial" states these measures depict also the states which were formed naturally but have representatives of the same groups in neighboring countries. As one would expect, these variables are positively correlated with our predicted segregation.[19] Nevertheless, our results are robust to controlling for the share of home country's population which is represented in neighboring states irrespective of which matching criteria are applied. The only notable difference between the results with and without these control variables is in the F-statistics for the excluded instrument from the first stage, they do drop once each of these control variables is included. Nonetheless, for the $\widehat{S}$ measure of segregation, they still remain sufficiently strong not to worry about weakness of the instrument.

6.2 Additional covariates and different samples

We have made a number of additional robustness checks to make sure that our results are not driven by an omitted variable. In particular, we included the following covariates which potentially could vary systematically with the level of segregation and the quality of government: 1) dummies for large geographical areas, i.e., East Asia and Pacific, South Asia, Europe and Central Asia, Latin America and Caribbean, North America, Middle East and North Africa, Sub-Saharan Africa; 2) a dummy indicating whether a country is a former colony; 3) the share of country's population living in urban areas (this could be important since group mixing is more likely in the cities and, at the same time, countries with higher urbanization usually are more developed); 4) a dummy indicating countries surrounded by water (this control could be important because by construction our instrument always predicts zero segregation for such countries);

[19] Note that the predicted segregation is more highly correlated with the shares of "partitioned groups" calculated based on our own matching compared to correlation with the Alesina et al. (2006) measure as predicted segregation is zero if there are no groups matched across the borders.

5) a measure of the extent to which a country is covered by rivers or other inland bodies of water and the standard deviation of the elevation within country borders (as both rivers and mountains affect the costs of mobility); and 6) the share of population which belongs to the "other" group (as it affects the $\widehat{S}$ instrument and could be related to the quality of statistics, which, in turn, may be related to the overall quality of government). The results of both the OLS and IV regressions are practically unaffected by inclusion of these additional covariates.

We checked that our results do not depend on the quality of the data on the sub-national group composition: we re-ran all regressions for the sample of countries with good-quality data, and the results are robust. We also verified that the results are robust to the exclusion of OECD countries and/or transition countries from the sample as well as controlling for OECD and transition country dummies.

6.3 Influential observations

The results are robust to the exclusion of any one particular country from the sample. The two most influential observations (which affect the results in favor of our story) are Chile (which has low ethnic segregation and very high quality of government conditional on other covariates) and Zimbabwe (which has very high ethnic segregation and low government quality). If we exclude both Chile and Zimbabwe from the sample, the results become weaker. Nonetheless, in the sample that excludes dictatorships, the coefficient on ethnic segregation remains statistically significant for government effectiveness, the rule of law, and control of corruption in IV regressions and for voice, political stability, the rule of law and control of corruption in the OLS regressions. Moreover, Chile and Zimbabwe have a countervailing force in the second stage regressions for ethnic diversity: Bulgaria and Russia are very influential observations, but they work against our story. Excluding Bulgaria (which has a relatively high quality of government and an extremely high predicted ethnic segregation) and Russia (where both predicted ethnic segregation and the quality of government are low) strengthens the negative effect of ethnic segregation on government quality.

Linguistic segregation also has a statistically significant negative effect on voice, political stability, the rule of law and control of corruption in the OLS regressions without Chile and Zimbabwe. But the instruments become weak in the second stage. Yet, once we exclude the USA – the most influential observation in the first stage – in addition to Chile and Zimbabwe, the instrument for language becomes strong enough, and then the statistically significant results are obtained in the second stage regressions for voice and political stability. We conclude that the effect of segregation cannot be explained by the presence of outliers.

6.4 Instrument

We have also examined the sensitivity of the results to our instrument by experimenting with different ways of constructing it. First, we recalculated it taking into account tiny states such as San Marino and Liechtenstein and got almost exactly the same results. Second, we constructed an instrument which treats a border with an ocean (or sea) as an additional neighbor with no gravity force, i.e., as if the ocean were another neighboring country with none of the home country groups represented. And again, we got very similar results to the baseline.[20] Third, we tried to construct the predicted segregation of groups across hypothetical regions in which the gravity force is based on the relative number of people in each group in neighboring countries instead of the relative fractions of groups (i.e., taking the population size of neighbors into account). In particular, the gravity force parameter from the equation 1 was replaced by $\frac{\pi_m^k T^k}{\sum_j \pi_m^j T^j}$, where T^k is the total population of the neighboring country k. The results for language are the same, while the results for ethnicity are statistically weaker both in the first and in the second stage. Nonetheless, in the second stage, the results remain statistically significant for political stability, government effectiveness and the rule of law.

It is important to note that for the vast majority of countries, the baseline instrument is very similar to all other versions of the instrument that we tried. But there are a few exceptions. The list of the countries for which there are large differences in the prediction of segregation between the baseline and at least one of the alternative approaches is as follows: Argentina, Austria, Brazil, Ecuador, Guatemala, Israel, Jordan, Latvia, Mexico, Morocco, Saudi Arabia, and Spain. We re-estimated the 2SLS regressions excluding these countries from the sample and the results turned out to be robust. Despite the reduction in the sample size, the first stage works well for $\widehat{S}$ and the second stage yields the following results. Linguistic segregation has a negative significant effect on voice, political stability, government effectiveness and the rule of law (and on all outcomes without exception in the sub-sample of democracies); while ethnic segregation has a negative significant effect on political stability and government effectiveness. (Control of corruption is also significant, but only in the sub-sample of democracies.) In addition, we estimated all our instrumental variable regressions with Generalized Method of Moments instead of 2SLS and got very similar results with stronger statistical significance.

We also considered the weakness of the $\widetilde{S}$ instrument. As we already mentioned, the strength of the predictive power of the instrument for language segregation measured by $\widetilde{S}$ strongly depends on the inclusion of the US in the sample. As the scatter plot in the middle row of Figure 7 shows, the US is a very influential observation in the first stage: it has very high predicted segre-

[20] The main difference between the results is that the instrument which takes the sea border into account has a better predictive power in the case of language (because the predicted segregation decreases for the USA and becomes much closer to what it actually is); and it has worse predictive power in the case of ethnicity (because the predicted segregation for Brazil increases substantially and becomes a very poor predictor of the actual Brazil's segregation).

gation, while its actual segregation is not that high. The US is the only country with predicted segregation measured by $\widetilde{S}$ equal to one, as all of the English-speaking population is predicted to be located in the north next to Canada, and all the Spanish-speaking population is predicted to be located in the south next to Mexico. If one excludes the US from the sample, F-statistics for the $\widetilde{S}$ instrument for language rise to over 20, while the coefficient on linguistic segregation in the second stage remains negative and statistically significant for voice, political stability, and the rule of law.

7 Conclusions

This paper achieves three goals. First, it has provided a new data set on composition of ethnic, linguistic and religious groups at the sub-national level for about 90 countries which can be used to study a wide variety of politico-economic questions previously out of reach for an empirical researcher. Second, it has suggested an instrument for segregation in a country based on the composition of groups in the home and neighboring countries. Third, it has shown that more ethnic and linguistic segregation is associated with significantly lower government quality, holding fractionalization constant both in the OLS and 2SLS regressions. The effect of ethnic and linguistic segregation on the quality of government is stronger in a subset of democracies. The results are robust to inclusion of an extensive list of controls, alternative definitions of segregation, and exclusion of influential observations.

Thus, our results show that if two countries have the same level of fractionalization at the national level, quality of government is lower in the more ethnically segregated country, i.e., in the country where different ethnic groups live relatively more apart. Several arguments may explain this finding, and future research may investigate the channels more precisely, either with cross-country studies or by focusing on specific countries. One argument is that groups living apart do not develop a commonality of goals and views that would allow better policymaking. Also, geographic concentration of groups may exacerbate ethnically- and geographically-based suboptimal policies at the expense of good governance at the national level. Ethnic voting may be easier to organize and may favor the selection of politicians on the basis of geographic and ethnic characteristics, rather than quality. In some cases, secession threats may force the central government to focus on repression or appeasement, subtracting resources from more productive use.

References

[1] Alesina, Alberto, Reza Baqir, and William Easterly, "Public Goods and Ethnic Divisions," *Quarterly Journal of Economics*, November 1999, 114:1243-1284.

[2] Alesina, Alberto, Arnaud Devleeschauwer, William Easterly, Sergio Kurlat, and Romain Wacziarg, "Fractionalization," *Journal of Economic Growth*, June 2003, 8:155-194.

[3] Alesina, Alberto, William Easterly, and Janina Matuszeski, "Artificial States," NBER Working Paper No. 12328, June 2006.

[4] Alesina, Alberto, and Edward Glaeser, *Fighting Poverty in the US and Europe: A World of Difference*, Oxford University Press, Oxford, UK, April 2004.

[5] Alesina, Alberto, and Eliana La Ferrara, "Ethnic Diversity and Economic Performance," *Journal of Economic Literature*, September 2005, 43:721-761.

[6] Alesina, Alberto, and Enrico Spolaore, *The Size of Nations*, MIT Press, Cambridge, MA, November 2003.

[7] Banerjee, Abhijit and Rohini Pande, "Parochial Politics: Ethnic Preferences and Politician Competition," KSG Working Paper No. RWP07-031, June 2007.

[8] Cutler, David, and Edward Glaeser, "Are Ghettos Good or Bad?" *Quarterly Journal of Economics*, August 1997, 112:827-872.

[9] Cutler, David, Glaeser, Edward, and Jacob Vigdor, "The Rise and Decline of the American Ghetto," *Journal of Political Economy*, June 1999, 107:455-506.

[10] Cutler, David, Glaeser, Edward, and Jacob Vigdor, "When Are Ghettos Bad? Lessons from Immigrant Segregation in the United States," *Journal of Urban Economics*, May 2008, 63:759-774.

[11] Easterly, William, and Ross Levine, "Africa's Growth Tragedy: Policies and Ethnic Divisions," *Quarterly Journal of Economics*, November 1997, 112:1203-1250.

[12] Echenique, Frederico and Roland Fryer, "A Measure of Segregation Based on Social Interactions," *Quarterly Journal of Economics*, forthcoming.

[13] Jenks, Christopher, and Susan Meyer, "Residential Segregation, Job Proximity and Black Job Opportunity," in L. Lynn and M. McGreary (eds.), *Inner City Poverty in the United States*, National Academic Press, Washington, DC, 1990.

[14] Kain, John, "Housing Segregation, Negro Employment and Metropolitan Decentralization," *Quarterly Journal of Economics*, May 1968, 82:175-197.

[15] Kain, John, "The Spatial Mismatch Hypothesis: Three Decades Together," *Housing Policy Debate*, 2008, 3:371-392.

[16] Kaufmann, Daniel, Aart Kraay, and Pablo Zoido-Lobaton, "Governance Matters." World Bank Policy Research Working Paper No. 2196, Washington, D.C., 1999.

[17] Kaufmann, Daniel, Aart Kraay, and Pablo Zoido-Lobaton, "Governance Matters II – Updated Indicators for 2000/01." World Bank Policy Research Working Paper No. 2772, Washington, D.C., 2002.

[18] Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzzi, "Governance Matters V: Aggregate and Individual Governance Indicators for 1996-2005." World Bank Policy Research Working Paper No. 4012. Washington, D.C., 2006.

[19] La Ferrara, Eliana, and Antonio Mele, "Racial Segregation and Public School Expenditure," CEPR Discussion Paper 5750, 2006.

[20] La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, "Trust in Large Organizations," American Economic Review, May 1997, 87(2):333-338.

[21] La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, "The Quality of Government," *Journal of Law, Economics, 971 and Organization*, 1999, 15(1): 222–279.

[22] MacMillan, Margaret, *Paris 1919: Six Months that Changed the World*, Random House Trade Paperbacks, New York, NY, 2003.

[23] Persson, Torsten and Guido Tabellini, *The Economic Effects of Constitutions: What Do the Data Say?*, MIT Press, Cambridge, MA, 2003.

[24] Reardon, Sean and Glenn Firebaugh, "Measures of Multi-Group Segregation," *Sociological Methodology*, 2002, 32: 33-67.

[25] Spolaore, Enrico, and Romain Wacziarg, "The Diffusion of Development," NBER Working Paper 15253, March 2008.

[26] Stock, James, Jonathan Wright and Motohiro Yogo, "A Survey of Weak Instruments and Weak Identification in Generalized Method of Moments," *Journal of Business & Economic Statistics,* 2002, 20(4):518–29.

[27] Tiebout, Charles, "A Pure Theory of Local Public Expenditures," *Journal of Political Economy*, October 1956, 64:416-424.

[28] Treisman, Daniel, "Decentralization and the quality of government," 2000, Mimeo, UCLA.

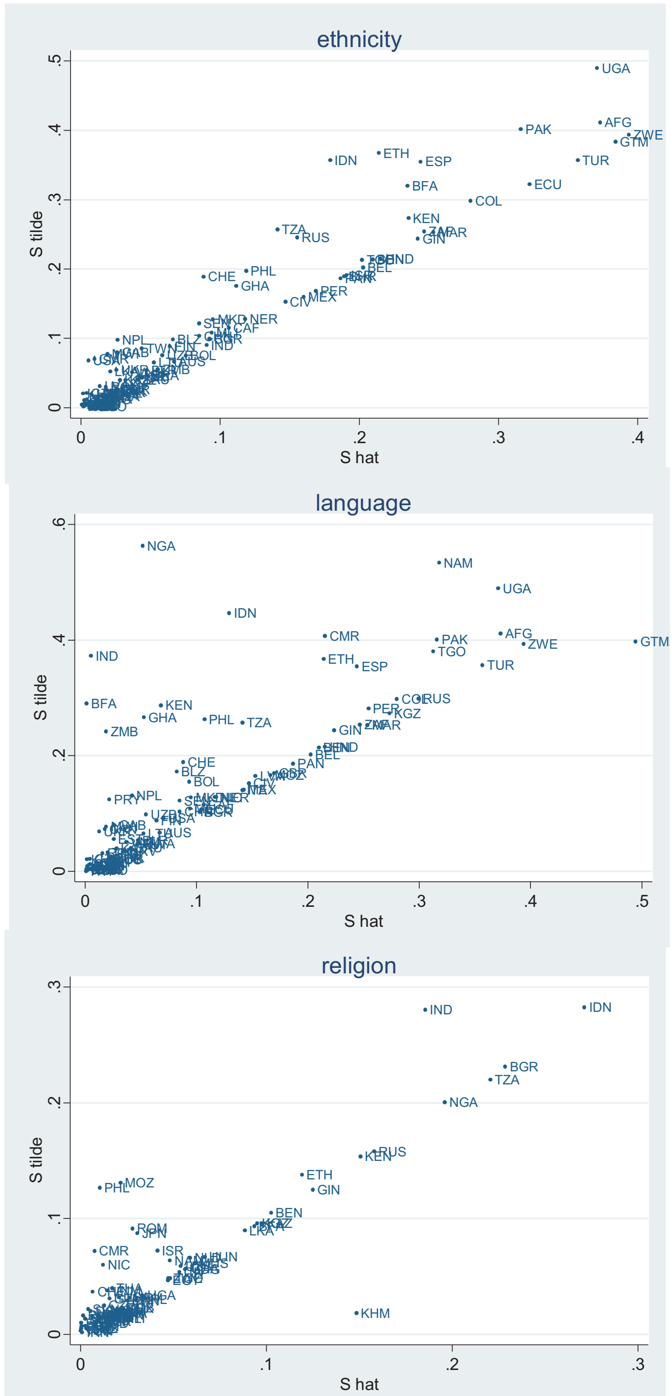


Figure 1: Segregation indices $\widetilde{S}$ and $\widehat{S}$

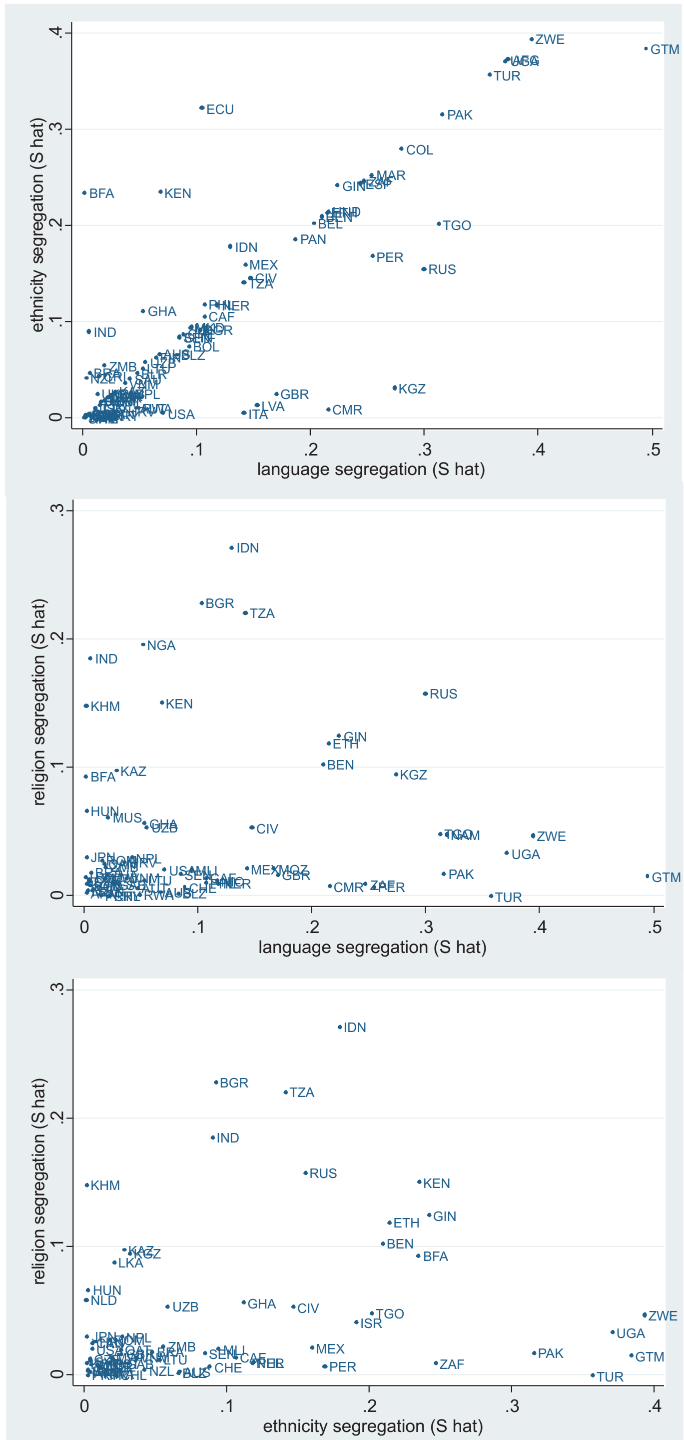


Figure 2: Segregation indices along the three dimensions of diversity

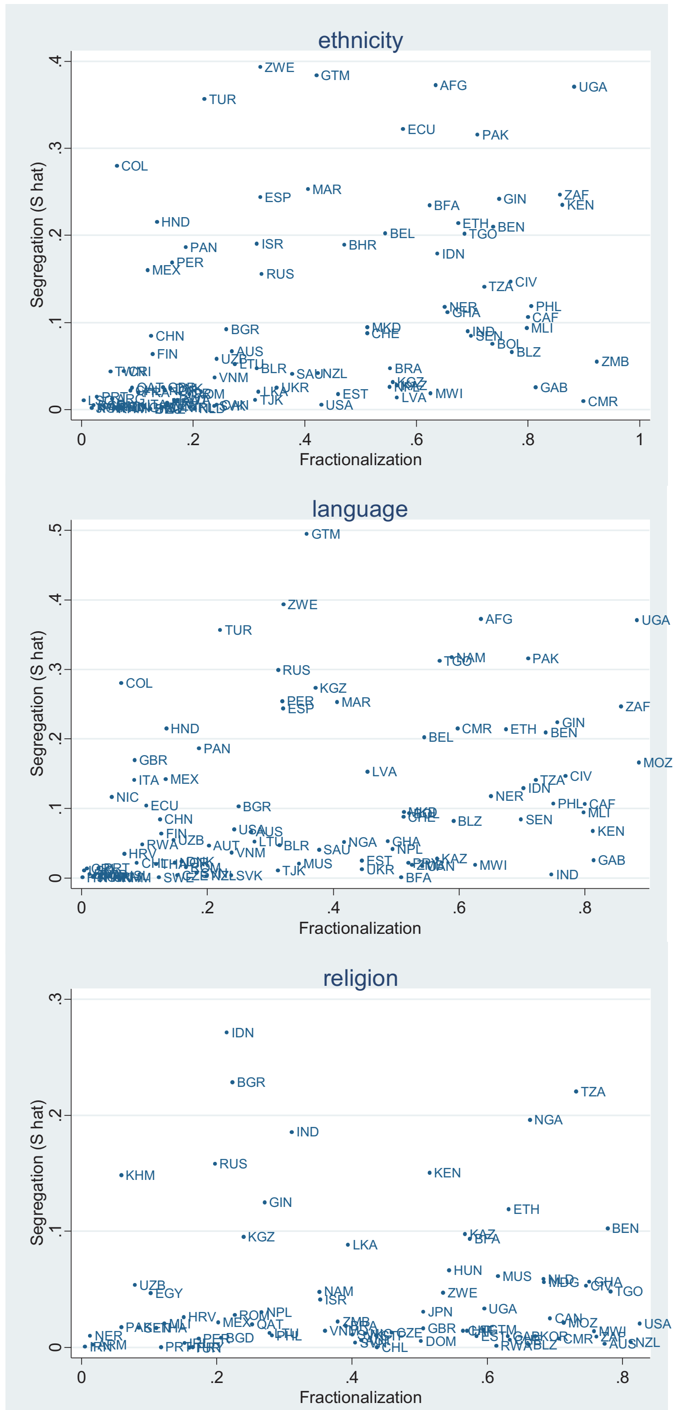


Figure 3: Segregation and fractionalization indices

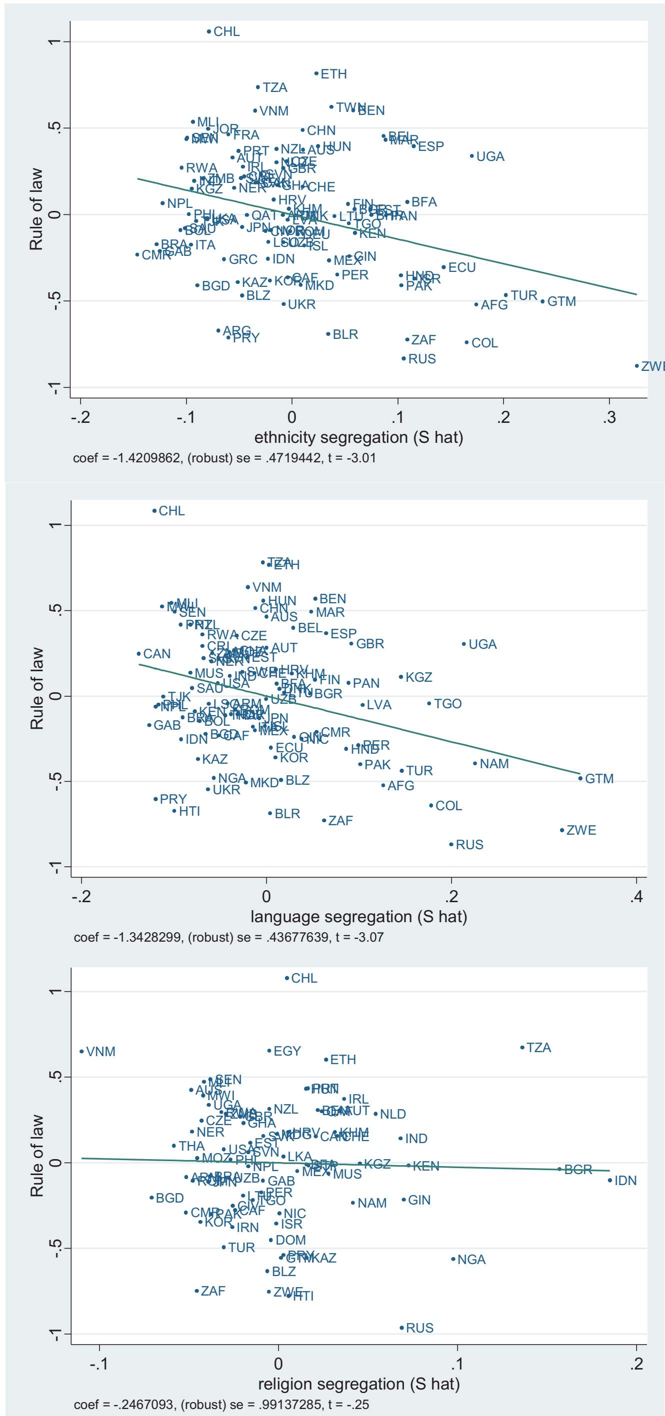


Figure 4: Residual scatter plots for rule of law and segregation (OLS)

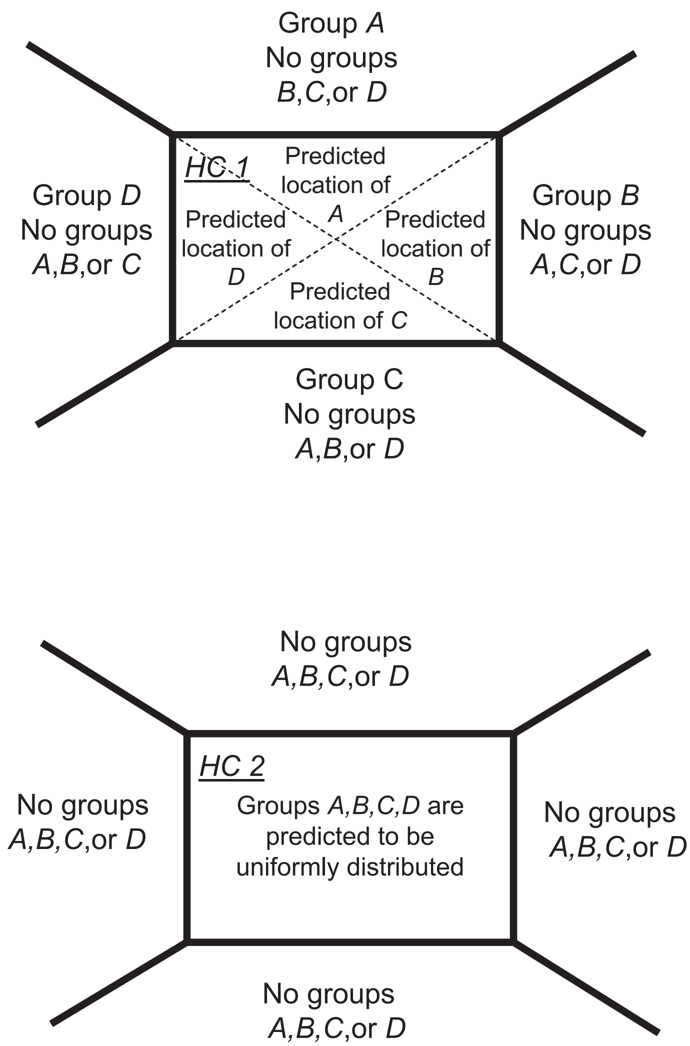
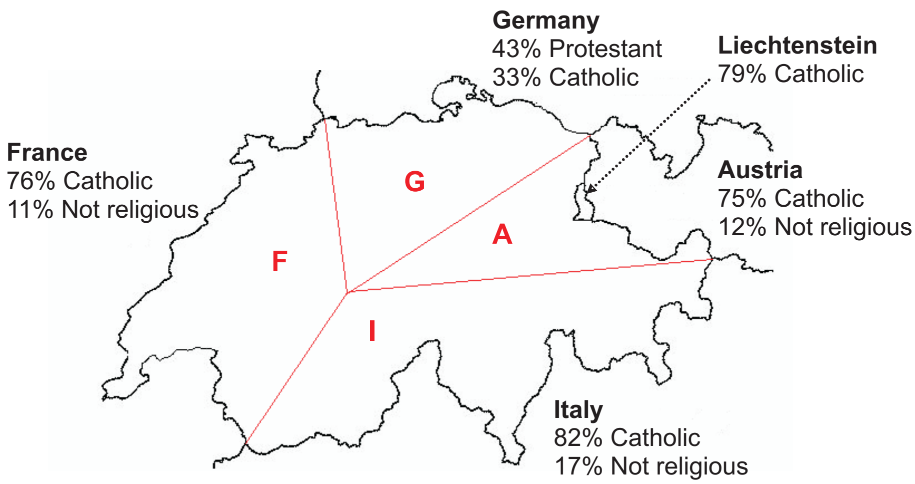


Figure 5: Predicted location of groups



	Entire Switzerland:	Hypothetical regions: F	G	A	I
Catholic	44.16	12.62	5.48	12.45	13.61
Protestant	37.21	0	37.21	0	0
Not religious	11.73	3.23	0	3.52	4.99
Muslim	4.50	1.13	1.13	1.13	1.13
Orthodox Christian	1.90	0.48	0.48	0.48	0.48
Jewish	0.25	0.06	0.06	0.06	0.06

% of total population

Figure 6: Predicted location of religious groups across hypothetical regions in Switzerland

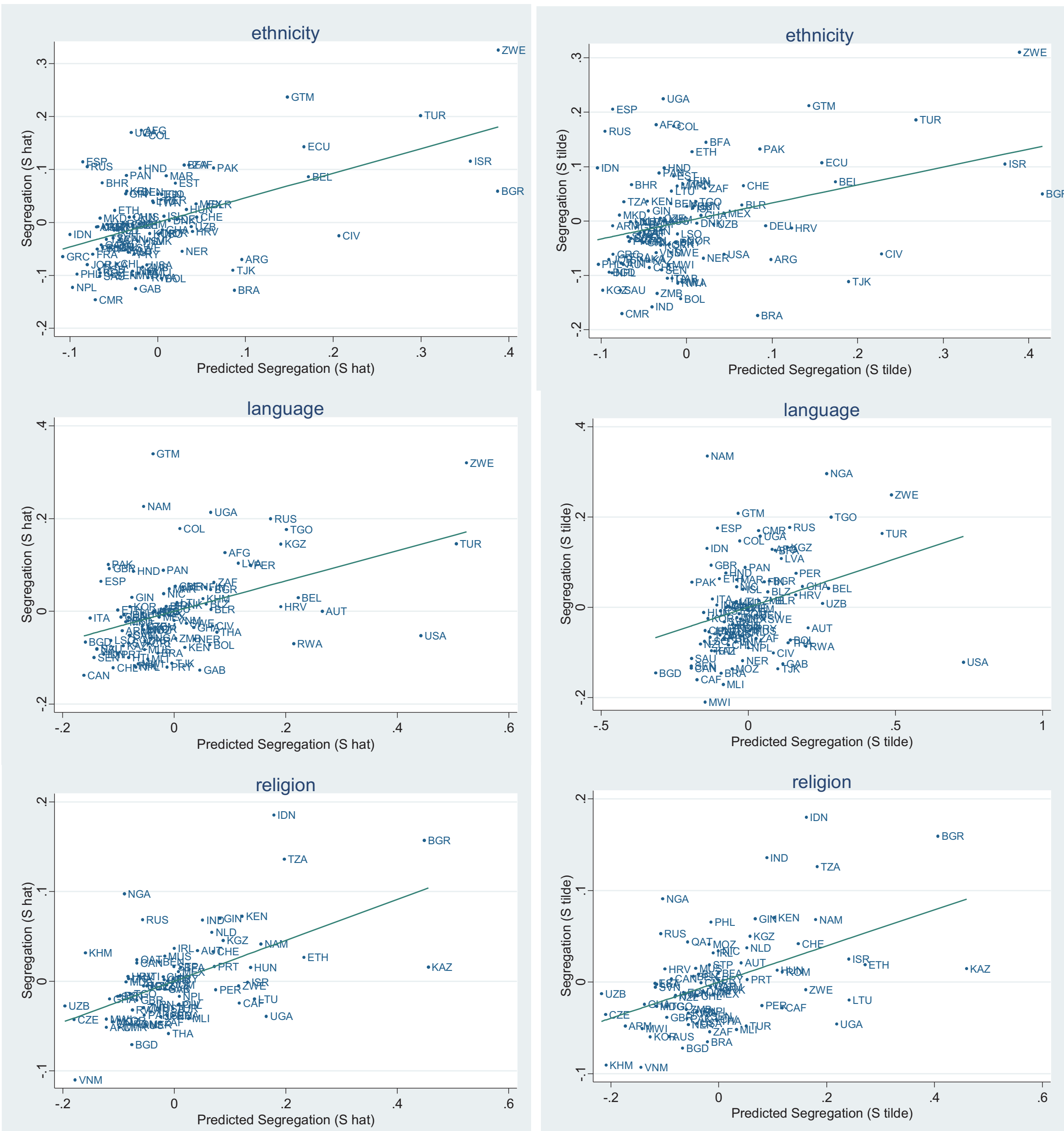


Figure 7: Predictive power of the instrument conditional on all controls

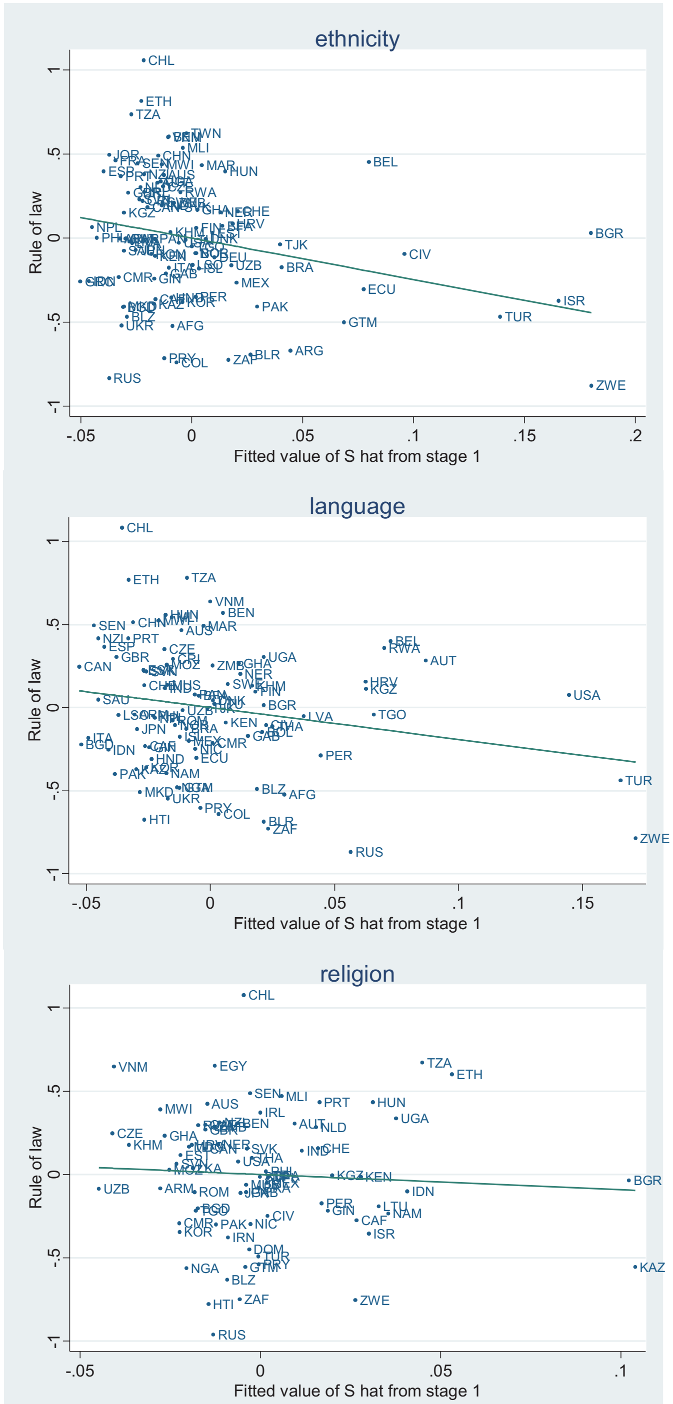


Figure 8: Residual scatter plots for the rule of law and segregation (second stage of 2SLS)

Table 1: The most and the least segregated countries

Most segregated:			Least segregated:		
Ethnicity					
	$\widehat{S}$	F		$\widehat{S}$	F
Zimbabwe	0.39	0.32	Germany	0.001	0.12
Guatemala	0.38	0.42	Sweden	0.001	0.12
Afghanistan	0.37	0.63	Netherlands	0.001	0.20
Uganda	0.37	0.88	Cambodia	0.001	0.06
Turkey	0.36	0.22	Korea	0.002	0.02
Language					
	$\widehat{S}$	F		$\widehat{S}$	F
Guatemala	0.49	0.36	Haiti	0.001	0.00
Zimbabwe	0.39	0.32	Sweden	0.001	0.12
Afghanistan	0.37	0.63	Burkina Faso	0.001	0.51
Uganda	0.37	0.88	Cambodia	0.001	0.06
Turkey	0.36	0.22	Korea	0.002	0.02
Religion					
	$\widehat{S}$	F		$\widehat{S}$	F
Indonesia	0.27	0.21	Turkey	0.0000	0.16
Bulgaria	0.23	0.22	Chile	0.0002	0.44
Tanzania	0.22	0.73	Paraguay	0.0003	0.16
Nigeria	0.20	0.66	Portugal	0.0005	0.12
India	0.19	0.31	Iran	0.0007	0.00

Note: $\widehat{S}$ – segregation index; F – fractionalization index.

Table 2: Correlation table: Segregation and the quality of government

	Segregation indices					
	Ethnicity $\widehat{S}$	Language $\widehat{S}$	Religion $\widehat{S}$	Ethnicity $\widetilde{S}$	Language $\widetilde{S}$	Religion $\widetilde{S}$
Voice	-0.36	-0.30	-0.25	-0.37	-0.36	-0.19
Political stability	-0.55	-0.45	-0.33	-0.56	-0.54	-0.30
Government effectiveness	-0.35	-0.24	-0.27	-0.35	-0.32	-0.23
Regulatory quality	-0.34	-0.24	-0.26	-0.35	-0.32	-0.23
Rule of law	-0.40	-0.30	-0.29	-0.40	-0.38	-0.25
Control of corruption	-0.36	-0.27	-0.31	-0.37	-0.36	-0.27

Table 3: Segregation and the rule of law, OLS regressions

	Rule of law					
	(1)	(2)	(3)	(4)	(5)	(6)
Segregation $\widehat{S}$ (ethnicity)	-2.50***	-1.42***				
	[0.72]	[0.47]				
Fractionalization (ethnicity)	-1.20***	0.02				
	[0.28]	[0.22]				
Segregation $\widehat{S}$ (language)			-1.84**	-1.34***		
			[0.71]	[0.44]		
Fractionalization (language)			-1.00***	0.23		
			[0.33]	[0.22]		
Segregation $\widehat{S}$ (religion)					-4.53***	-0.25
					[1.33]	[0.99]
Fractionalization (religion)					0.76*	0.41
					[0.42]	[0.25]
ln (population)		-0.02		-0.03		-0.05*
		[0.03]		[0.03]		[0.03]
ln (GDP per capita)		0.48***		0.48***		0.39***
		[0.06]		[0.07]		[0.06]
Protestants share		0.007**		0.005		0.003
		[0.003]		[0.003]		[0.003]
Muslims share		0.002		0.001		0.001
		[0.002]		[0.002]		[0.003]
Catholics share		-0.002		-0.003		-0.003
		[0.002]		[0.002]		[0.002]
Latitude		0.28		0.60		0.82
		[0.46]		[0.49]		[0.58]
English legal origin		0.22*		0.15		0.12
		[0.12]		[0.15]		[0.14]
German legal origin		0.38**		0.27		0.35*
		[0.16]		[0.19]		[0.18]
Socialist legal origin		-0.40**		-0.49**		-0.34
		[0.19]		[0.22]		[0.23]
Scandinavian legal origin		-0.07		-0.06		0.00
		[0.26]		[0.34]		[0.00]
Democratic tradition		0.06***		0.07***		0.09***
		[0.02]		[0.02]		[0.03]
Mountains		0.05		0.19		0.03
		[0.16]		[0.17]		[0.20]
Constant	0.79***	-3.98***	0.53***	-4.09***	-0.2	-3.21***
	[0.17]	[0.78]	[0.20]	[0.74]	[0.18]	[0.67]
Observations	97	97	92	92	78	78
R-squared	0.24	0.87	0.15	0.87	0.12	0.84

Note: Robust standard errors adjusted for heteroscedasticity in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4: Ethnic and linguistic segregation and the quality of government, OLS

	Ethnicity						Language					
	Voice	Political stability	Govern-t effectiv.	Regul. quality	Rule of law	Control of corr.	Voice	Political stability	Govern-t effectiv.	Regul. quality	Rule of law	Control of corr.
Panel A. Baseline: All controls and full sample												
Segregation	-1.11**	-2.24***	-0.7	-0.82	-1.42***	-0.93*	-1.32***	-1.82***	-0.79*	-0.68	-1.34***	-1.05**
	[0.49]	[0.59]	[0.52]	[0.76]	[0.47]	[0.51]	[0.43]	[0.56]	[0.47]	[0.67]	[0.44]	[0.47]
Fractionalization	0.16	0.11	0.06	0.17	0.02	-0.12	0.26	0.06	0.32	0.3	0.23	0.07
	[0.21]	[0.27]	[0.21]	[0.25]	[0.22]	[0.23]	[0.19]	[0.27]	[0.22]	[0.25]	[0.22]	[0.24]
R-squared	0.836	0.728	0.855	0.776	0.873	0.862	0.836	0.737	0.851	0.766	0.869	0.858
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Sample	full	full	full	full	full	full	full	full	full	full	full	full
Obs.	97	97	97	97	97	97	92	92	92	92	92	92
Panel B. No controls and full sample												
Segregation	-2.36***	-3.77***	-1.86**	-1.72**	-2.50***	-2.15***	-1.83***	-2.91***	-1.22*	-1.03	-1.84**	-1.53**
	[0.69]	[0.67]	[0.72]	[0.85]	[0.72]	[0.72]	[0.66]	[0.67]	[0.72]	[0.79]	[0.71]	[0.74]
Fractionalization	-0.80***	-0.72***	-1.33***	-0.96***	-1.20***	-1.39***	-0.75**	-0.72**	-1.08***	-0.91***	-1.00***	-1.18***
	[0.29]	[0.26]	[0.28]	[0.24]	[0.28]	[0.30]	[0.30]	[0.30]	[0.33]	[0.27]	[0.33]	[0.35]
R-squared	0.176	0.337	0.223	0.19	0.242	0.227	0.129	0.242	0.13	0.126	0.153	0.149
Controls	no	no	no	no	no	no	no	no	no	no	no	no
Sample	full	full	full	full	full	full	full	full	full	full	full	full
Obs.	97	97	97	97	97	97	92	92	92	92	92	92
Panel C: All controls; sample excludes dictatorships												
Segregation	-2.20***	-2.66***	-1.37***	-1.63**	-1.92***	-1.59***	-1.80***	-2.03***	-1.22***	-1.18*	-1.66***	-1.45***
	[0.44]	[0.61]	[0.52]	[0.73]	[0.48]	[0.51]	[0.45]	[0.58]	[0.45]	[0.68]	[0.42]	[0.45]
Fractionalization	0.50***	0.21	0.34	0.27	0.25	0.12	0.42*	0.07	0.44	0.24	0.28	0.17
	[0.18]	[0.29]	[0.21]	[0.23]	[0.21]	[0.22]	[0.23]	[0.32]	[0.26]	[0.25]	[0.25]	[0.27]
R-squared	0.844	0.766	0.878	0.799	0.883	0.88	0.826	0.784	0.874	0.78	0.886	0.881
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Sample	democ	democ	democ	democ	democ	democ	democ	democ	democ	democ	democ	democ
Obs.	77	77	77	77	77	77	75	75	75	75	75	75

Note: Robust standard errors adjusted for heteroscedasticity in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5: Religious segregation and the quality of government, OLS

	Religion					
	Voice	Political stability	Govern-t effectiv.	Regul. quality	Rule of law	Control of corr.
Panel A. Baseline: All controls and full sample						
Segregation	0.53	-1.07	-0.17	0.4	-0.25	-0.18
	[0.93]	[1.36]	[0.93]	[0.85]	[0.99]	[0.87]
Fractionalization	0.12	0.61*	0.52*	0.24	0.41	0.57**
	[0.26]	[0.32]	[0.26]	[0.23]	[0.25]	[0.27]
R-squared	0.814	0.679	0.834	0.755	0.837	0.829
Controls	yes	yes	yes	yes	yes	yes
Sample	full	full	full	full	full	full
Obs.	78	78	78	78	78	78
Panel B. No controls and full sample						
Segregation	-3.71***	-4.72***	-4.29***	-3.53***	-4.53***	-5.07***
	[1.40]	[1.39]	[1.29]	[1.25]	[1.33]	[1.32]
Fractionalization	0.78*	0.72**	0.75*	0.63*	0.76*	0.94**
	[0.40]	[0.35]	[0.43]	[0.37]	[0.42]	[0.44]
R-squared	0.109	0.153	0.11	0.103	0.118	0.146
Controls	no	no	no	no	no	no
Sample	full	full	full	full	full	full
Obs.	78	78	78	78	78	78
Panel C: All controls; sample excludes dictatorships						
Segregation	-0.52	-1.47	0.06	-0.17	-0.32	0.05
	[0.93]	[1.15]	[0.90]	[0.92]	[0.86]	[0.80]
Fractionalization	0.57**	0.72**	0.57*	0.19	0.45	0.53*
	[0.24]	[0.36]	[0.29]	[0.25]	[0.28]	[0.30]
R-squared	0.801	0.719	0.849	0.764	0.852	0.849
Controls	yes	yes	yes	yes	yes	yes
Sample	democ	democ	democ	democ	democ	democ
Obs.	64	64	64	64	64	64

Note: Robust standard errors adjusted for heteroscedasticity in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6: First stage: Segregation and predicted segregation

Panel A: Segregation index $\widehat{S}$

	Full sample; All controls			Full sample; No controls			Democ sample; All controls		
	E $\widehat{S}$	L $\widehat{S}$	R $\widehat{S}$	E $\widehat{S}$	L $\widehat{S}$	R $\widehat{S}$	E $\widehat{S}$	L $\widehat{S}$	R $\widehat{S}$
Instrument	0.46***	0.33***	0.23***	0.49***	0.32***	0.25***	0.52***	0.32***	0.27***
	[0.12]	[0.10]	[0.07]	[0.12]	[0.07]	[0.07]	[0.13]	[0.11]	[0.06]
Fract-n	0.11**	0.15***	-0.01	0.13***	0.15***	-0.01	0.08*	0.13***	0.01
	[0.05]	[0.05]	[0.03]	[0.03]	[0.03]	[0.02]	[0.05]	[0.05]	[0.03]
Obs.	97	92	78	97	92	78	77	75	64
R-squared	0.52	0.44	0.53	0.39	0.31	0.34	0.59	0.41	0.61
F-stat (het)	15.32	10.72	11.36	17.04	18.28	14.96	15.11	8.13	20.38
F-stat (hom)	28.31	18.75	26.97	33.21	23.22	38.64	35.72	15.64	24.94

Panel B: Segregation Index $\widetilde{S}$

	Full sample; All controls			Full sample; No controls			Democ sample; All controls		
	E $\widetilde{S}$	L $\widetilde{S}$	R $\widetilde{S}$	E $\widetilde{S}$	L $\widetilde{S}$	R $\widetilde{S}$	E $\widetilde{S}$	L $\widetilde{S}$	R $\widetilde{S}$
Instrument	0.33***	0.21*	0.20***	0.35***	0.20**	0.21***	0.40***	0.2	0.25***
	[0.12]	[0.12]	[0.06]	[0.12]	[0.09]	[0.06]	[0.14]	[0.14]	[0.06]
Fract-n	0.18***	0.26***	0.02	0.20***	0.29***	0.01	0.15***	0.26***	0.03
	[0.05]	[0.05]	[0.03]	[0.04]	[0.04]	[0.02]	[0.05]	[0.05]	[0.04]
Obs.	97	92	78	97	92	78	77	75	64
R-squared	0.48	0.50	0.48	0.34	0.36	0.25	0.55	0.50	0.56
F-stat (het)	7.22	3.16	10.66	8.31	5.30	13.08	8.58	2.05	14.42
F-stat (hom)	11.64	8.59	19.79	13.84	9.37	24.92	16.45	6.17	21.42

Note: Robust standard errors adjusted for heteroscedasticity in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. “F-stat (het)” reports F-statistics for the excluded instrument from the first stage under the assumption of heteroscedasticity; and “F-stat (hom)” – under the assumption of homoscedasticity. “E” – ethnicity; “L” – language; “R” – religion.

Table 7: Segregation and the rule of law, the second stage of the 2SLS regressions

	Rule of law					
	(1)	(2)	(3)	(4)	(5)	(6)
Segregation $\widehat{S}$ (ethnicity)	-3.88**	-2.46***				
	[1.75]	[0.67]				
Fractionalization (ethnicity)	-0.97**	0.17				
	[0.38]	[0.25]				
Segregation $\widehat{S}$ (language)			-1.14	-1.92**		
			[2.08]	[0.74]		
Fractionalization (language)			-1.11***	0.32		
			[0.42]	[0.23]		
Segregation $\widehat{S}$ (religion)					-6.65**	-0.91
					[2.92]	[1.87]
Fractionalization (religion)					0.76*	0.43*
					[0.43]	[0.24]
ln (population)		-0.01		-0.02		-0.05
		[0.03]		[0.03]		[0.04]
ln (GDP per capita)		0.48***		0.48***		0.39***
		[0.07]		[0.08]		[0.06]
Protestants share		0.01*		0.005		0.002
		[0.00]		[0.003]		[0.003]
Muslims share		0.003		0.001		0.001
		[0.002]		[0.002]		[0.003]
Catholics share		-0.001		-0.003		-0.003
		[0.002]		[0.002]		[0.002]
Latitude		0.2		0.64		0.76
		[0.47]		[0.50]		[0.58]
English legal origin		0.21		0.12		0.12
		[0.13]		[0.16]		[0.14]
German legal origin		0.35**		0.2		0.35*
		[0.17]		[0.21]		[0.19]
Socialist legal origin		-0.44**		-0.54**		-0.31
		[0.19]		[0.24]		[0.23]
Scandinavian legal origin		0.02		-0.11		0
		[0.29]		[0.37]		[0.00]
Democratic tradition		0.06***		0.07***		0.09***
		[0.02]		[0.02]		[0.03]
Mountains		0.1		0.24		0.01
		[0.17]		[0.19]		[0.20]
Constant	0.84***	-4.11***	0.49**	-4.18***	-0.1	-3.24***
	[0.18]	[0.84]	[0.22]	[0.78]	[0.20]	[0.66]
Observations	97	97	92	92	78	78
R-squared	0.23	0.87	0.15	0.87	0.10	0.84
F-stat (het)	17.04	15.32	18.28	10.72	14.96	11.36
F-stat (hom)	33.21	28.31	23.22	18.75	38.64	26.97

Note: Robust standard errors adjusted for heteroscedasticity in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. "F-stat (het)" reports F-statistics for the excluded instrument from the first stage under the assumption of heteroscedasticity; and "F-stat (hom)" – under the assumption of homoscedasticity.

Table 8: Ethnic and linguistic segregation and the quality of government, the second stage of 2SLS

	Ethnicity						Language					
	Voice	Political stability	Govern-t effectiv.	Regul. quality	Rule of law	Control of corr.	Voice	Political stability	Govern-t effectiv.	Regul. quality	Rule of law	Control of corr.
Panel A. Baseline: All controls and full sample												
Segregation	-1.28	-3.64***	-2.14***	-2.10*	-2.46***	-1.77**	-2.49***	-3.07***	-1.60*	-1.84	-1.92**	-1.47
	[1.03]	[1.37]	[0.69]	[1.24]	[0.67]	[0.72]	[0.74]	[0.79]	[0.83]	[1.20]	[0.74]	[0.98]
Fractionalization	0.18	0.31	0.26	0.35	0.17	0	0.44*	0.25	0.44*	0.48	0.32	0.14
	[0.24]	[0.33]	[0.25]	[0.32]	[0.25]	[0.27]	[0.22]	[0.29]	[0.25]	[0.31]	[0.23]	[0.28]
R-squared	0.836	0.71	0.84	0.76	0.865	0.858	0.822	0.719	0.845	0.749	0.866	0.857
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Sample	full	full	full	full	full	full	full	full	full	full	full	full
Obs.	97	97	97	97	97	97	92	92	92	92	92	92
F-stat (het)	15.32	15.32	15.32	15.32	15.32	15.32	10.72	10.72	10.72	10.72	10.72	10.72
F-stat (hom)	28.31	28.31	28.31	28.31	28.31	28.31	18.75	18.75	18.75	18.75	18.75	18.75
Panel B. No controls and full sample												
Segregation	-2.84*	-5.32***	-3.61**	-3.58**	-3.88**	-3.49**	-2.89*	-3.61**	-0.79	-2.05	-1.14	-0.66
	[1.50]	[1.38]	[1.79]	[1.73]	[1.75]	[1.74]	[1.67]	[1.38]	[2.07]	[1.99]	[2.08]	[2.15]
Fractionalization	-0.72**	-0.46	-1.04***	-0.65*	-0.97**	-1.16***	-0.58	-0.61*	-1.14***	-0.75*	-1.11***	-1.32***
	[0.34]	[0.31]	[0.39]	[0.38]	[0.38]	[0.39]	[0.39]	[0.35]	[0.42]	[0.39]	[0.42]	[0.43]
R-squared	0.173	0.309	0.195	0.147	0.225	0.213	0.115	0.235	0.128	0.11	0.147	0.141
Controls	no	no	no	no	no	no	no	no	no	no	no	no
Sample	full	full	full	full	full	full	full	full	full	full	full	full
Obs.	97	97	97	97	97	97	92	92	92	92	92	92
F-stat (het)	17.04	17.04	17.04	17.04	17.04	17.04	18.28	18.28	18.28	18.28	18.28	18.28
F-stat (hom)	33.21	33.21	33.21	33.21	33.21	33.21	23.22	23.22	23.22	23.22	23.22	23.22
Panel C: All controls; sample excludes dictatorships												
Segregation	-2.26***	-3.11**	-2.61***	-2.40**	-2.46***	-2.22***	-2.94***	-2.59***	-2.16**	-2.18**	-2.18***	-2.07**
	[0.83]	[1.21]	[0.67]	[1.06]	[0.65]	[0.71]	[0.68]	[0.75]	[0.85]	[1.04]	[0.75]	[1.01]
Fractionalization	0.51**	0.27	0.50**	0.36	0.32	0.2	0.57**	0.14	0.56*	0.37	0.34	0.25
	[0.21]	[0.31]	[0.25]	[0.27]	[0.24]	[0.26]	[0.25]	[0.33]	[0.28]	[0.28]	[0.26]	[0.29]
R-squared	0.844	0.764	0.869	0.793	0.881	0.878	0.808	0.78	0.866	0.767	0.884	0.879
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Sample	democ	democ	democ	democ	democ	democ	democ	democ	democ	democ	democ	democ
Obs.	77	77	77	77	77	77	75	75	75	75	75	75
F-stat (het)	15.11	15.11	15.11	15.11	15.11	15.11	8.131	8.131	8.131	8.131	8.131	8.131
F-stat (hom)	35.72	35.72	35.72	35.72	35.72	35.72	15.64	15.64	15.64	15.64	15.64	15.64

Note: Robust standard errors adjusted for heteroscedasticity in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. "F-stat (het)" reports F-statistics for the excluded instrument from the first stage under the assumption of heteroscedasticity; and "F-stat (hom)" – under the assumption of homoscedasticity.

Table 9: Religious segregation and the quality of government, the second stage of 2SLS

	Religion					
	Voice	Political stability	Govern-t effectiv.	Regul. quality	Rule of law	Control of corr.
Panel A. Baseline: All controls and full sample						
Segregation	0.56	-2.12	-1.2	0.85	-0.91	-1.14
	[2.03]	[2.31]	[1.87]	[1.81]	[1.87]	[1.86]
Fractionalization	0.12	0.64*	0.55**	0.23	0.43*	0.60**
	[0.26]	[0.34]	[0.26]	[0.24]	[0.24]	[0.26]
R-squared	0.814	0.675	0.831	0.754	0.836	0.827
Controls	yes	yes	yes	yes	yes	yes
Sample	full	full	full	full	full	full
Obs.	78	78	78	78	78	78
F-stat (het)	26.97	26.97	26.97	26.97	26.97	26.97
F-stat (hom)	11.36	11.36	11.36	11.36	11.36	11.36
Panel B. No controls and full sample						
Segregation	-5.72	-4.39	-6.56**	-4.46	-6.65**	-7.50**
	[3.52]	[2.84]	[2.70]	[2.74]	[2.92]	[3.07]
Fractionalization	0.78*	0.72**	0.75*	0.63*	0.76*	0.94**
	[0.41]	[0.35]	[0.43]	[0.38]	[0.43]	[0.45]
R-squared	0.09	0.152	0.089	0.099	0.1	0.124
Controls	no	no	no	no	no	no
Sample	full	full	full	full	full	full
Obs.	78	78	78	78	78	78
F-stat (het)	38.64	38.64	38.64	38.64	38.64	38.64
F-stat (hom)	14.96	14.96	14.96	14.96	14.96	14.96
Panel C: All controls; sample excludes dictatorships						
Segregation	0.12	-2.4	-0.59	-0.36	-0.02	0.23
	[1.84]	[2.68]	[1.48]	[2.04]	[1.63]	[1.62]
Fractionalization	0.55**	0.75*	0.59**	0.2	0.45	0.53*
	[0.25]	[0.37]	[0.28]	[0.25]	[0.28]	[0.30]
R-squared	0.8	0.717	0.848	0.764	0.852	0.849
Controls	yes	yes	yes	yes	yes	yes
Sample	democ	democ	democ	democ	democ	democ
Obs.	64	64	64	64	64	64
F-stat (het)	24.94	24.94	24.94	24.94	24.94	24.94
F-stat (hom)	20.38	20.38	20.38	20.38	20.38	20.38

Note: Robust standard errors adjusted for heteroscedasticity in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. "F-stat (het)" reports F-statistics for the excluded instrument from the first stage under the assumption of heteroscedasticity; and "F-stat (hom)" – under the assumption of homoscedasticity.

A Data Appendix

Table A.1: Sources of data on group composition

Country	Ethnicity	Language	Religion
Afghanistan	Lang	NSO (www.mrrd.gov.af)	.
Argentina	INDEC (www.indec.mecon.ar)	.	.
Armenia	Census (www.armstat.am)	Census (www.armstat.am)	DHS (www.measuredhs.com)
Australia	Lang	Census (www.abs.gov.au)	Census (www.abs.gov.au)
Austria	NSO (www.statistik.at)	NSO (www.statistik.at)	NSO (www.statistik.at)
Bahrain	Census (www.bahrain.gov.bh)	.	.
Bangladesh	NSO (www.bbsgov.org)	Ethn	NSO (www.bbsgov.org)
Belarus	Census (www.ipums.umn.edu)	Census (www.ipums.umn.edu)	.
Belgium	Lang	www.eurolang.net	.
Belize	Census (www.statisticsbelize.org.bz)	Census (www.statisticsbelize.org.bz)	Census (www.statisticsbelize.org.bz)
Benin	DHS (www.measuredhs.com)	Ethn	DHS (www.measuredhs.com)
Bolivia	Census (www.ine.gov.bo)	Census (www.ine.gov.bo)	.
Brazil	Census (www.ipums.umn.edu)	Census (www.ipums.umn.edu)	Census (www.ipums.umn.edu)
Bulgaria	Census (www.nsi.bg)	Census (www.nsi.bg)	Census (www.nsi.bg)
Burkina Faso	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Cambodia	Lang	Census (www.ipums.umn.edu)	Census (www.ipums.umn.edu)
Cameroon	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Canada	Census (www.statcan.ca)	Census (www.statcan.ca)	Census (www.statcan.ca)
Central African Rep.	DHS (www.measuredhs.com)	Ethn	DHS (www.measuredhs.com)
Chile	Census (www.ine.cl)	Ethn	Census (www.ine.cl)
China	Census (www.ipums.umn.edu)	Ethn	.
Colombia	Census (www.ipums.umn.edu)	Ethn	.
Costa Rica	Census (www.ipums.umn.edu)	Census (www.ipums.umn.edu)	.
Cote D'Ivoire	DHS (www.measuredhs.com)	Ethn	DHS (www.measuredhs.com)
Croatia	Census (www.dzs.hr)	Census (www.dzs.hr)	Census (www.dzs.hr)
Czech Rep.	Census (www.czso.cz)	Ethn	Census (www.czso.cz)
Denmark	Council of Europe report	Ethn	.
Dominican Rep.	.	.	DHS (www.measuredhs.com)
Ecuador	Census (www.ipums.umn.edu)	Census (www.ipums.umn.edu)	.
Egypt	.	.	DHS (www.measuredhs.com)
Estonia	Census (http://pub.stat.ee)	Census (http://pub.stat.ee)	Census (http://pub.stat.ee)
Ethiopia	DHS (www.measuredhs.com)	Ethn	DHS (www.measuredhs.com)
Finland	Lang	NSO (www.stat.fi)	.
France	INED, Population, 2004 (www.ined.fr)	.	.
Gabon	DHS (www.measuredhs.com)	Ethn	DHS (www.measuredhs.com)
Germany	NSO (www-ec.destatis.de)	.	.
Ghana	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Greece	NSO (www.statistics.gr)	.	.
Guatemala	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Guinea	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Haiti	.	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Honduras	Census (www.ine-hn.org)	Ethn	.
Hungary	Census (www.nepszamlalas.hu)	Census (www.nepszamlalas.hu)	Census (www.nepszamlalas.hu)
Iceland	NSO (www.statice.is)	Ethn	.
India	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Indonesia	Census (www.bps.go.id)	DHS (www.measuredhs.com)	Census (www.bps.go.id)
Iran	.	.	NSO (www.sci.org.ir)
Ireland	Census (www.cso.ie)	.	Census (www.cso.ie)
Israel	NSO (www1.cbs.gov.il)	.	NSO (www1.cbs.gov.il)
Italy	NSO (www.dossierimmigrazione.it)	NSO (www.dossierimmigrazione.it)	.
Japan	Census (www.stat.go.jp)	Ethn	Census (www.stat.go.jp)
Jordan	Census (www.dos.gov.jo)	.	.
Kazakhstan	NSO (http://en.government.kz)	Ethn	DHS (www.measuredhs.com)
Kenya	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Korea	NSO (www.kosis.kr)	Ethn	NSO (www.kosis.kr)

Continued to the next page

Continued from the previous page

Country	Ethnicity	Language	Religion
Kyrgyzstan	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Latvia	NSO (www.csb.lv)	NSO (www.csb.lv)	.
Lesotho	Lang	DHS (www.measuredhs.com)	.
Lithuania	NSO (www.stat.gov.lt)	Ethn	NSO (www.stat.gov.lt)
Macedonia	NSO (www.stat.gov.mk)	Ethn	.
Madagascar	.	.	DHS (www.measuredhs.com)
Malawi	Lang	NSO (www.nso.malawi.net)	DHS (www.measuredhs.com)
Mali	DHS (www.measuredhs.com)	Ethn	DHS (www.measuredhs.com)
Mauritius	.	NSO (www.gov.mu)	NSO (www.gov.mu)
Mexico	Census (http://censos.ccp.ucr.ac.cr)	Census (http://censos.ccp.ucr.ac.cr)	Census (http://censos.ccp.ucr.ac.cr)
Morocco	Lang	Census (www.statistic-hcp.ma)	.
Mozambique	.	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Namibia	.	Census (www.npc.gov.na/census/index.htm)	DHS (www.measuredhs.com)
Nepal	Census (www.cbs.gov.np)	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Netherlands	NSO (www.cbs.nl)	.	NSO (www.cbs.nl)
New Zealand	Census (www.stats.govt.nz)	Census (www.stats.govt.nz)	Census (www.stats.govt.nz)
Nicaragua	.	Census (http://censos.ccp.ucr.ac.cr)	Census (http://censos.ccp.ucr.ac.cr)
Niger	NSO (www.stat-niger.org/)	Ethn	DHS (www.measuredhs.com)
Nigeria	.	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Norway	Census (http://statbank.ssb.no)	Ethn	.
Pakistan	Lang	Census (www.statpak.gov.pk)	Census (www.statpak.gov.pk)
Panama	Census (http://censos.ccp.ucr.ac.cr)	Ethn	.
Paraguay	Census (http://www.dgeec.gov.py)	Census (http://www.dgeec.gov.py)	Census (http://www.dgeec.gov.py)
Peru	DHS (www.measuredhs.com)	Census (www.inei.gob.pe/)	Census (www.inei.gob.pe/)
Philippines	Census (www.ipums.umn.edu)	Census (www.ipums.umn.edu)	Census (www.ipums.umn.edu)
Portugal	NSO (www.sef.pt)	Ethn	NSO (www.sef.pt)
Qatar	Census (www.planning.gov.qa)	.	Census (www.planning.gov.qa)
Romania	Census (www.ipums.umn.edu)	Census (www.ipums.umn.edu)	Census (www.ipums.umn.edu)
Russia	Census (www.perepis2002.ru)	Census (www.perepis2002.ru)	Census (www.perepis2002.ru)
Rwanda	DHS (www.measuredhs.com)	NSO (www.statisticsrwanda.gov.rw)	NSO (www.statisticsrwanda.gov.rw)
Sao Tome	.	.	Census (www.ine.st)
Saudi Arabia	NSO (www.cds.gov.sa)	Ethn	.
Senegal	DHS (www.measuredhs.com)	Ethn	DHS (www.measuredhs.com)
Slovakia	Census (http://portal.statistics.sk)	Ethn	Census (http://portal.statistics.sk)
Slovenia	Census (www.stat.si)	Census (www.stat.si)	Census (www.stat.si)
South Africa	Lang	Census (www.ipums.umn.edu)	Census (www.ipums.umn.edu)
Spain	Lang	Centro De Investigaciones Sociologicas (www.cis.es)	.
Sri Lanka	NSO (www.statistics.gov.lk)	.	NSO (www.statistics.gov.lk)
Sweden	NSO (www.ssd.scb.se)	Ethn	.
Switzerland	Lang	Piguet, E. and Wanner P., Population Studies 31, 2000.	Piguet, E. and Wanner P., Population Studies 31, 2000.
Taiwan	NSO (http://eng.dgbas.gov.tw)	.	.
Tajikistan	NSO (www.stat.tj)	Ethn	.
Tanzania	DHS (www.measuredhs.com)	Ethn	DHS (www.measuredhs.com)
Thailand	.	Census (web.nso.go.th)	Census (web.nso.go.th)
Togo	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Turkey	Multu, Servet (Int. J. Middle East Stud., 28, 1996)	Ethn	DHS (www.measuredhs.com)
Uganda	NSO (www.ubos.org)	Ethn	DHS (www.measuredhs.com)
Ukraine	Census (www.ukrcensus.gov.ua)	Census (www.ukrcensus.gov.ua)	.
United Kingdom	Council of Europe report	Council of Europe report	Council of Europe report
Usa	Census (www.census.gov)	Census (www.census.gov)	Census (www.census.gov)
Uzbekistan	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Vietnam	Census (www.ipums.umn.edu)	Ethn	Census (www.ipums.umn.edu)
Zambia	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)
Zimbabwe	Lang	DHS (www.measuredhs.com)	DHS (www.measuredhs.com)

Note: "NSO" – National Statistical Office; "DHS" – Demographics and Health Survey. "Lang" means that language data were used for ethnicity and "Enth" means that ethnicity data were used for language. This happens when there are no independent sources of regional-level data for language and ethnicity and, at the same time, national-level statistics on ethnic and linguistic diversity coincide. More detailed information about the data sources is available from the authors upon request.

Table A.2: Summary statistics

variable	Obs.	Mean	SD	Min	Max
Panel A: Segregation and Fractionalization Indices					
Segregation (ethnicity) $\widetilde{S}$	97	0.12	0.12	0	0.49
Segregation (ethnicity) $\widehat{S}$	97	0.10	0.11	0	0.39
Segregation (language) $\widetilde{S}$	92	0.16	0.14	0	0.56
Segregation (language) $\widehat{S}$	92	0.11	0.11	0	0.49
Segregation (religion) $\widetilde{S}$	78	0.06	0.06	0	0.28
Segregation (religion) $\widehat{S}$	78	0.05	0.06	0	0.27
Fractionalization (ethnicity)	97	0.37	0.27	0	0.92
Fractionalization (language)	93	0.36	0.27	0	0.89
Fractionalization (religion)	78	0.43	0.24	0	0.83
Panel B: Dependent and control variables					
Voice and accountability	109	0.07	0.93	-1.63	1.54
Political stability	109	-0.11	0.88	-2.26	1.48
Government effectiveness	109	0.13	1.00	-1.46	2.29
Regulatory quality	109	0.15	0.86	-2.12	1.67
Rule of law	109	0.05	1.00	-1.68	2.07
Control of corruption	109	0.06	1.06	-1.41	2.47
ln (population)	109	16.41	1.57	11.84	20.95
ln (GDP per capita)	109	8.53	1.20	6.27	10.41
Protestants share	109	12.96	22.38	0	97.80
Muslims share	109	19.61	33.04	0	99.40
Catholics share	109	34.09	36.76	0	96.90
Latitude	109	0.32	0.20	0	0.72
English legal origin	109	0.25	0.43	0	1
French legal origin	109	0.44	0.50	0	1
German legal origin	109	0.06	0.23	0	1
Socialist legal origin	109	0.21	0.41	0	1
Scandinavian legal origin	109	0.05	0.21	0	1
Democratic tradition	109	4.86	3.62	0	10
Mountains	109	0.28	0.26	0	0.94
Panel C: Instrumental variables					
Predicted $\widetilde{S}$ (ethnicity)	97	0.08	0.11	0	0.49
Predicted $\widehat{S}$ (ethnicity)	97	0.06	0.10	0	0.47
Predicted $\widetilde{S}$ (language)	92	0.12	0.19	0	1
Predicted $\widehat{S}$ (language)	92	0.09	0.15	0	0.86
Predicted $\widetilde{S}$ (religion)	78	0.11	0.15	0	0.79
Predicted $\widehat{S}$ (religion)	78	0.09	0.14	0	0.75

Table A.3: Correlation table: Indices of actual and predicted segregation

		Ethnicity				Language				Religion			
		$\widetilde{S}$ seg	$\widehat{S}$ seg	$\widetilde{S}$ inst	$\widehat{S}$ inst	$\widetilde{S}$ seg	$\widehat{S}$ seg	$\widetilde{S}$ inst	$\widehat{S}$ inst	$\widetilde{S}$ seg	$\widehat{S}$ seg	$\widetilde{S}$ inst	$\widehat{S}$ inst
Ethnicity	$\widetilde{S}$ seg	1											
Ethnicity	$\widehat{S}$ seg	0.96	1										
Ethnicity	$\widetilde{S}$ inst	0.40	0.48	1									
Ethnicity	$\widehat{S}$ inst	0.43	0.53	0.97	1								
Language	$\widetilde{S}$ seg	0.85	0.80	0.28	0.31	1							
Language	$\widehat{S}$ seg	0.80	0.84	0.41	0.46	0.80	1						
Language	$\widetilde{S}$ inst	0.20	0.22	0.53	0.47	0.28	0.29	1					
Language	$\widehat{S}$ inst	0.25	0.31	0.57	0.56	0.25	0.43	0.89	1				
Religion	$\widetilde{S}$ seg	0.32	0.21	0.12	0.11	0.46	0.16	-0.03	-0.10	1			
Religion	$\widehat{S}$ seg	0.33	0.22	0.13	0.13	0.41	0.13	0.01	-0.06	0.89	1		
Religion	$\widetilde{S}$ inst	0.28	0.23	0.32	0.31	0.20	0.18	-0.02	0.03	0.50	0.50	1	
Religion	$\widehat{S}$ inst	0.27	0.22	0.29	0.27	0.19	0.16	-0.04	0.01	0.52	0.58	0.96	1

Note: “seg” indicates the actual indices of segregation; “inst” indicates their corresponding instruments.

Table A.4: Sources of control variables

Variable	Definition
ln (Population)	Natural log of population in the country. Average for the years 1995-2004. Source: World Development Indicators 2006.
ln (GDP per capita)	Natural log of GDP in constant 2000 international dollars per capita. Average for the years 1995-2004. Source: World Development Indicators 2006. For initial value of GDP per capita we use natural log of GDP in constant 2000 international dollars per capita. Average for the years 1975-1980. Source: World Development Indicators 2006.
Religion	Identifies the percentage of the population of each country that belonged to the three most widely spread religions in the world in 1980. For countries of recent formation, the data is available for 1990-95. The numbers are in percent (scale from 0 to 100). The three religions identified here are: (1) Romanic Catholic; (2) Protestant; and (3) Muslim. Source: La Porta et. al. (1998). Original sources: World Christian Encyclopedia 1982, Worldmark Encyclopedia of Nations 1995, Statistical Abstract of the World 1995, Demographic Yearbook 1995, CIA World Factbook 1996
Legal origin	Identifies the legal origin of the Company Law or Commercial Code of each country. There are five possible origins: (1) English Common Law; (2) French Commercial Code; (3) German Commercial Code; (4) Scandinavian Commercial Code; and (5) Socialist/Communist laws. Source: La Porta et. al. (1998). Original sources: CIA World Factbook 1996.
Latitude	The absolute value of the latitude of the country, scaled to take values between 0 and 1. Source: La Porta et. al. (1998). Original source: CIA World Factbook 1996
Democratic tradition	Democracy score index. Scale from 0 to 10, with lower values indicating a less democratic environment. Average for the years 1975-2004. Source: Polity IV Project: Political Regime Characteristics and Transitions, 1800-2006.
Fertility	Fertility rate (births per woman). Average for the years 1975-2004. Source: World Development Indicators 2006.
Investment	Investment share as % of GDP. Average for the years 1975-2004. Source: Penn World Table 6.2.
Openness	Export plus Import as % of GDP. Average for the years 1975-2004. Source: Penn World Table 6.2.
Mountains	Measure of mountains in the country. Source: William Easterly's data.
Colonial origin	Identifies countries that were colonized by a Western overseas colonial power since 1700 for at least 10 years. Source: Teorell and Hadenius (2005).
Region	Identifies the region where the country is situated. There are six possible regions: (1) East Asia and Pacific; (2) Europe and Central Asia; (3) Latin America and Carribean; (3) Middle East and North Africa; (4) North America; (5) South Asia; and (6) Sub-Saharan Africa. Source: World Bank.
Island	Identifies countries that are situated on islands and therefore have no bordering countries. Source: CIA World Factbook 1996
OECD	Identifies countries that are currently members of OECD. These countries are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, USA. Source: wikipedia.org.
Transition	Identifies transition countries. These countries are Armenia, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Macedonia, Romania, Russian Federation, Slovak Republic, Slovenia, Tajikistan, Ukraine, Uzbekistan, Source: wikipedia.org.
Partitioned	Percent of the population of each country that belongs to groups partitioned by the border. Source: Alesina et. al. (2006).
Squiggliness	Log of basic fractal index based on World Vector Shoreline Dataset (GIS format). This variable measures squiggliness of each country's border. Source: Alesina et. al. (2006).
Elevation	Standard deviation of elevation of each country in meters. Source: GIS dataset.
Rivers	Share of area of the country covered by large perennial bodies (rivers, lakes, seas). Source: GIS dataset.