INSTITUTIONAL CLUSTERS[*]

By Jon Jellema and

Gérard Roland

UC Berkeley

Abstract: We ran principal component regressions of growth and income on existing measures of institutions to assess which institutions are the most important for economic performance. We varied the sets of variables to search for robust effects of institutions. Our major finding is that broadly defined institutions of checks and balances limiting the power of the executive are the most robust institutional determinants of growth. There is also some evidence that a democratic, participatory and anti-authoritarian culture matters. These effects are even stronger in instrumental variable regressions.

1.Introduction

There is a growing consensus among economists, following the work of Douglass North and others, that institutions are important in determining long run economic performance. A celebrated paper by Acemoglu, Johnson, and Robinson (2001) has given empirical evidence of the causal impact of institutions on growth (see also Hall and Jones, 1999). While these results are still being debated (see e.g. Albouy, 2005), there is widespread acknowledgement of the central role of institutions in understanding economic development. Nevertheless, a large portion of the research agenda that seeks to better understand the precise channels between institutions and economic performance remains unfinished. Progress needs to be made on at least two important fronts.

First of all, measurement issues loom large. Most cross-country analyses of the effect of institutions on economic performance use aggregate measures of institutions. These aggregate measures are usually based on subjective evaluations of institutions which contain noise and are suspiciously volatile (see e.g. Glaeser et al., 2004). More importantly, these measures are likely to be infected by perceptions that are inevitably tainted by a country's economic performance. A large number of measures of institutions are nevertheless already available. Many are completely or mostly objective and therefore less likely to be biased. There has not been an attempt to aggregate these measures into more reliable synthetic measures of institutions.

A second issue, more important from the policy point of view, is that we do not know which institutions are the most relevant for growth. There exists research on the effect of specific institutions such as legal institutions (see e.g. La Porta et al., 1998; Glaeser and Shleifer, 2002), political institutions (see e.g. Persson and Tabellini, 2003) or culture (see e.g. Di Tella and MacCulloch, 2005) on economic performance but there is very little research comparing the relative effect of specific institutions. Acemoglu and Johnson (2005) compare what they call contracting institutions and property right institutions. The former is measured by legal variables (a subset of those we examine below) and the latter by constraints on the executive; they find the latter are the more relevant for growth. However, a more comprehensive approach is needed: setting up "horseraces" between various institutions is potentially misleading because these institutional variables are

likely to be correlated. Multicollinearity issues are thus likely to thwart any comprehensive attempt to disentangle the effect of different institutions.

In this paper, we make progress on these issues by using factor analysis on existing measures of institutions. This approach has several advantages. First of all, it allows us to construct a comprehensive measure of institutions based not necessarily on subjective perceptions but using existing measures of specific institutions. Many of these measures are noisy and most are quite blunt. They are thus likely to be riddled with measurement error. Another advantage of principal component analysis is that it makes it possible to tease out the relevant covariation among existing measures of institutions. A third advantage is that is allows to deal with multicollinearity among institutions, as principal components are constructed to be orthogonal to each other. Substantively, principal component analysis should help us to construct a small number of institutional clusters out of the numerous institutional variables available and thus potentially provide answers to the question of which institutions matter. A potential drawback of principal component analysis is that there is often no clear-cut way to interpret the principal components obtained: interpretations are often subjective. In practice, this is only a problem when interpretation is not obvious.

We have gathered all measures of institutions available (to our knowledge) in order to identify robust clusters of institutions that matter for growth. The main trade-off that emerges in this kind of exercise is between comprehensiveness and coverage. The different databases usually cover different sets of countries. The more databases one puts together, the smaller will be the group of countries for which measures exist on that comprehensive list of institutions. The disadvantage of smaller coverage is then compounded by problems of statistical significance. Since there is no good solution to this tradeoff, we performed regressions with a large set of institutional variables as well as regressions with smaller sets of variables. We only report in this paper a small subset of the regressions attempted. Many institutional variables turned out never to be picked up in significant principal components and were later dropped.

All along in this research, robustness has been our main concern. Each time one changes the set of variables from which the principal components are produced, the

components themselves can change and must be reinterpreted. It was necessary to try a large combination of variables in order to get a sense of the robust results.

We used two approaches. In a first approach, we computed principal components for each of three broad categories of variables: political, judicial and cultural variables. The advantage of this approach is that one gets good synthetic measures for each of these categories. The disadvantage is that there may be multicollinearity between these different categories of variables. The second approach was to put together all institutional variables to construct institutional clusters using only objective measures of institutions. Each principal component can then be a combination of political, judicial and cultural variables and each principal component will be orthogonal to every other.

Concern for robustness led us also to use different measures of GDP and to use both growth and income as regressors. We present only some of the typical regressions we obtained.

What are our main results? First of all, the institutional clusters obtained are quite intuitive. We find that broad clusters matter in general, not specific institutions. Few variables are in general robustly significant. Legal institutional variables are rarely significant, political and cultural variables are more often significant. The only robust result we find is that what matters for long-run income growth are political institutions of limited executive and checks and balances. We also find positive effects of an anti-authoritarian, democratic, participatory culture. Instrumental variable estimation tends to strengthen these results and systematically gives larger effects.

In section 2, we describe the data. Section 3 gives a brief discussion of our strategy of principal component estimation. Section 4 gives the analysis and in section 5, we report results for instrumental variable estimation. We conclude with the general lessons we learn from this exercise.

2. Description of the Data

There are broadly three categories of data on institutions: judicial, political and cultural. We shall discuss these in order.

In a series of papers, Shleifer, together with La Porta, Lopez-de-Silanes and various co-authors gathered several variables detailing specific laws and procedures on the books in countries' legal systems. Djankov et al. (2003) provide the legal origin and the legal formalism index (detailed in the data appendix) for 109 countries around the year 2000. La Porta et al. (2004) covered the power and reach of the judicial system for 71 countries; included are judge tenure, case law, judicial review, and constitutional rigidity variables detailed in the data appendix. Though those variables were published in a single database in 2004, the data on which they are based come primarily from Maddex (1995).

Two papers covered different aspects of the regulatory burden for 85 countries, again around the year 2000 (Botero et al., 2004 and Djankov et al., 2002). Djankov et al. (2002) observes the number of procedures or codes a new business has to comply with in order to obtain legal status. Botero et al. (2004) covered the number and type of laws governing formal employment contracts, including worker protections and prohibitions on certain types of contracts, the protection and extent of collective bargaining, and the protection and extent of the social security system.

Two more papers cover securities regulation and investor protections in 49 countries around the year 1995. La Porta et al. (1998) detail the rights and responsibilities guaranteed to corporate shareholders and creditors, including in the event of bankruptcy and/or reorganization. La Porta, Lopez-de-Silanes, and Shleifer (2006) looks more generally at securities laws and how they regulate the issuance of new equity to the public. Disclosure requirements, liability standards, supervisor/regulator characteristics and power (including power to issue rules and investigate), and sanctions are all covered.

Together, the work of Shleifer and co-authors captures a substantial portion of the legal rules on the books in a cross-section of countries, especially those rules covering quintessentially economic transactions like selling labor or buying securities. Furthermore, unlike the other broad (in terms of country coverage) databases of judicial or legal variables of which we are aware, most of the variables constructed by Shleifer and co-authors observe only the existence of laws; they do not attempt to rate the "effectiveness" of either the laws themselves or the systems the laws comprise.

Persson and Tabellini have also published a suite of papers rich with data on political institutions. Electoral rules (proportional, semi-proportional, or majoritarian) and executive regime types (presidential or parliamentary) are covered in Persson and Tabellini (2003) for between 90 and 100 countries around 1998. The number of legislative districts, the number of legislators, the number of legislators elected by party list, and average district magnitude (legislators per electoral district) are observed as an average from 1990 to 1998 for roughly 85 countries. They also include an indicator for countries with a federal political structure in 1998 for 83 countries. The bulk of the institutional variables introduced in Persson and Tabellini (2003) focus on observable technical features of political institutions.

Another database with a wealth of political indicators is the Database of Political Institutions (Beck et al., 2000). The database covers 177 countries over the years 1975 to 2000; there are far too many variables (106 in the most recent version) to mention all of them, so we will briefly discuss the major categories and some interesting examples. In the Chief Executive category, there are variables detailing tenure rules, stability, and vote percentage received. There are also indicators for whether the chief executive and defense ministers are military officers. There are variables detailing the characteristics (political orientation, age, percent of seats, etc.) of the chief executive's party, the government parties, and the opposition parties, and the number and size of unaligned parties. There are measures of fractionalization within and total seats held by the government and opposition parties, as well as fractionalization for the legislature as a whole and an indicator for whether a simple majority of seats is held by the opposition. There are variables for plurality/proportional voting and district magnitude as well as measures of competition in legislative and executive elections, all of which are discussed in detail in the data appendix. There are also variables measuring the number and strength of checks on the power of both legislature and executive. Finally, there are indicators for local elections and the extent of revenue/regulatory authority in sub-national governments and an indicator for autonomous regions.

The Polity IV Project (Marshall and Jaggers, 2000), which is an update of a project begun three decades ago (Gurr, 1974), contains data on the authority characteristics of government regimes from the beginning of the 19th century to 2003. Every independent state with a population over 500,000 is covered, though not necessarily for the same number of years. Variables include an "institutionalized democracy" and "institutionalized autocracy" index measuring the openness or closedness, respectively, of political institutions. A higher democracy score signals the existence of institutions or procedures through which citizens can meaningfully express their political preferences as well as the existence of institutionalized constraints on the exercise of power by the executive. Higher autocracy scores are given to states in which competitive political participation is suppressed or prohibited altogether and the chief executive exercises power with few constraints. Importantly, the autocracy index does *not* explicitly include any indicators of government control over social and economic activity.

In order to construct these indices, the Polity dataset introduces several discrete multinomial variables describing patterns of authority between governors and the governed. "Regulation of Chief Executive Recruitment" characterizes the method by which executive power is transferred (e.g., by election, by designation, by forceful seizure). "Competitiveness of Executive Recruitment" measures how equal the opportunities for advancement are inside the hierarchy of the political system (e.g., open elections are competitive, hereditary succession is not). "Openness of Executive Recruitment" measures the extent to which the entire population has an opportunity (in principle) to attain the position of chief executive through a regularized process. "Executive Constraints" refers to the extent of institutionalized constraints on the decision-making powers of chief executives. The sources of constraints might be the legislative and judicial system (as in most Western democracies), but can include any "accountability group" like the ruling party in a one-party state, powerful advisors in monarchies, or the military in coup-prone polities. More detail on the Executive Constraint variable from Polity IV can be found in the data appendix. The "Regulation of Participation" and "Competitiveness of Participation" variables measure regulation and competitiveness, respectively, in the political arena by describing when, whether, and

how political preferences are expressed and what recourse is available for pursuing alternative policies and leadership. Like all of the databases we have mentioned so far, the value of the Polity IV project lies not only in its breadth of coverage (in terms of country*year pairs), but also in its focus on (mostly) observable features of the political system rather than ad-hoc measures of "performance".

Freedom in the World, a survey published by Freedom House every year since 1972, measures freedom according to two broad categories: political rights and civil liberties. In the latest survey, 192 countries were covered. Political rights enable people to participate freely in the political process, including through the right to vote, compete for public office, and elect accountable representatives who have a decisive impact on public policies. Civil liberties allow for the freedoms of expression and belief, associational and organizational rights, rule of law, and personal autonomy without interference from the state. The two variables observe assessments by regional experts and scholars, but importantly they are assessments of compliance with established basic standards derived from the Universal Declaration of Human Rights. The standards are applied to all countries surveyed, regardless of location, cultural composition or history, or level of economic development and the survey explicitly does not rate or incorporate governments or government performance. The assessments are based on a broad range of sources (local and international media; academic, think-tank, and NGO analyses; visits to and contacts in the region) and are reviewed and cross-checked at the country, regional, and global level as well as against the historical record. To answer the political rights questions, Freedom House considers to what extent the political system offers voters the opportunity to choose freely from among candidates and to what extent the candidates are chosen independently of the state. In answering the civil liberties questions, Freedom House does not equate constitutional guarantees of human rights with the on-the-ground fulfillment of these rights. Both laws and actual practices are factored into the ratings decisions. Thus, the Freedom House ratings serve as a complement to the Polity IV variables.

The World Values Survey (WVS), designed to provide measurement of cultural values in all major areas of human concern, contains nearly 200 variables related to culture for approximately 80 to 90 countries (containing roughly 85 percent of the

world's population). In each of four waves (1981, 1990, 1995, and 1999/2000) the WVS questionnaire is given to nationally representative samples, so country-wide averages and inter-country comparisons are possible. Since a description of all WVS variables is not feasible, we list some of the categories into which WVS questions fall and interesting examples from each; in addition, there are several individual WVS variables detailed in the data appendix.

The *Perceptions of Life* category asks respondents to consider what is important to them in their lives (friends, family, politics, work, etc.), what they believe is important to teach their own children, how they rate their own feelings of happiness and health, who they spend most of their free time with, and who they would *not* like to have as neighbors. The *Work* category asks respondents what they consider important in a job (good pay, good hours, respect from coworkers, whether the job is useful for society, etc.), their attitudes towards work and compensation and how they would run a workplace. The *Family* category asks respondents about their ideal marriage and child-rearing situation, and the roles of men and women both in the household and in the workplace. The *Politics and Society* category asks respondents about the role of government and of citizens in politics, the goals their country should work towards, whether particular society-wide changes would be good or bad, to rate their confidence in various sectors of society (media, churches, armed forces, the environmental movement, trade agreements, etc.), and their views on democracy. The *Religion and Morality* category asks respondents for their views on the importance of God and religion (organized or free-form), the proper divide between state and religion, and their views on specific moral issues (cheating on taxes, homosexuality, joyriding, littering, political assassination, etc.). Finally, the *National Identity* category asks respondents to rate how strongly they identify with their city, region, and country as well as how they feel about people in neighboring countries and supranational bodies like the European Union or the United Nations. There is also a comprehensive set of socio-demographic identifiers for each respondent: sex, age, ethnicity, marital status, household size, education, employment, income and residence.

The World Christian Encyclopedia (Barrett, Kurian, and Johnson, 2001) covers essentially only one variable: religion, specifically the number of adherents of 24

different faiths (including atheism and seven different flavors of Christianity). But it covers it well: there is data for 238 countries in the year 2000, for a smaller number of countries in 1990 and 1970, and estimates for some countries in 1900. There is also data on the presence and type of official state religions in the same years.

Apart from the well-defined categorization of institutions, there are also multiple indicators based mostly on subjective assessments. The Governance Indicators dataset published by the World Bank is the compilation of 37 separate quality of governance surveys given to firms, citizens and experts and includes indices of "Voice and Accountability", "Political Stability", "Government Effectiveness", "Regulatory Quality", "Rule of Law" and "Control of Corruption". The World Business Environment Survey, also published by the World Bank, covers enterprise ratings of the investment climate and business environment, governance, regulatory impediments, and public service quality. The Corruption Perceptions Index from Transparency International documents perceptions of the degree of corruption as seen by business people, academics and risk analysts. The Index of Economic Freedom (Heritage Foundation), Economic Freedom of the World (Fraser Institute), and the Global Competitiveness Report (World Economic Forum) all combine macroeconomic policy indicators (inflation, tariffs, income tax rates, government consumption, etc.) with survey responses of experts or business leaders on the "effectiveness" or "efficiency" of the legal structure and property rights. Surveys published for profit include The International Country Risk Guide (Political Risk Services), Business International (now part of *The Economist Intelligence Unit*), the Operations Risk Index (Business Environment Risk Intelligence), and the Opacity Index (PriceWaterhouseCoopers). These surveys ask the companies' own staffs, firm and bank officers, and government officials for ratings on bureaucratic and judicial performance, and the prevalence of the rule of law (including corruption and risk of expropriation).[1] We chose not to use these variables in our regressions. They are quite correlated with the other measures of institutions described in this section but their interpretation can sometimes be misleading.

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[1] There is often considerable overlap between these surveys. For example, Governance Indicators uses data from all of the other sources mentioned in this paragraph. The Heritage Foundation and Fraser Institute indices of legal structure/property rights rely heavy on assessments from the World Economic Forum, Political Risk Services, and Transparency International publications.

3. Producing Principal Components

Factor analysis is nothing more than the numerical reduction of the dimension of a covariance matrix. There are no "priors" about relationships among the variables it analyzes. Therefore, the output of a factor analysis program can be sensitive to the set of variables included for reduction. Any addition to or subtraction from the set of variables making up the factor analysis set changes the dimension and shape of the vector space within which factor analysis works. This in turn may change the shape and dimension of the vector space described by the factors or latent variables produced. Finally, any change in the factor space potentially changes coefficient estimates.

We employ two strategies to cope with these sensitivities. First, we include varying combinations of variables in the factor analysis set (while refraining from imposing any structure). This exercise determines which variables are often grouped together in a latent variable no matter what other variables are included in the factor analysis set. We prefer to think of this as robustness in the construction of the factors themselves. If we find in a particular specification that income is related to one of our factors, we are able to check whether the underlying variables usually combine in this particular way or if instead it is a novel combination of underlying variables that we are using. If it is the latter, then its significance in explaining income is, in a sense, moot: the factor itself is not robust and does not occur outside one particular set of underlying variables. The disadvantage of this strategy is that the interpretation of the principal components obtained can potentially be difficult as each principal component is likely to contain a composite of different classes of institutions.

The second strategy we employ is to impose some structure on the set of underlying variables before using factor analysis to reduce the dimensions of our data matrix. We find enough independently measured variables for three broad categories of institutions: political, judicial (or legal), and cultural. After grouping variables into these categories, we compute principal components for all three separately and independently. Within each category, we again try different combinations of underlying variables to

make sure the produced factors are robust in the sense described above. The advantage of doing this is that we are able to get good summary measures of political and judicial institutions and also of culture. This allows us to draw inferences on the role of each of these three classes of institutions on economic performance. The disadvantage is that the measures we get for these three classes of institutions might be correlated, creating thus a problem of multicollinearity. For example, we found that the correlation between the first principal component from the political variable set and the first principal component from the cultural variable set often had a correlation coefficient around 0.6 or 0.7 (absolute value).

For each of the two strategies detailed above, we present results from a few different underlying variables sets where the factors produced and their significance in income regressions are typical. None of the factors (significant or not) in the results presented are anomalous combinations that only appear for a particular set of underlying variables.

4. Income and Institutions

In Tables 1 through 5 we present results from regressions of income and income growth on several sets of principal components created using the methods described above. In the appendix tables we give a short exposition of the set of variables used in creating the components and the weights or loadings each variable has in each of the principal components created. Thus the principal components described in Table A1 are those used in the regression specifications in Table 1; those in Table A2 are used in Table 2; and so on.

In each table, we use both log income and income growth as dependent variables. We have two sources for both levels and growth, the Summers-Heston data base and the World Bank data base. The sources differ in both start and end year and in method of measurement. The differences are discussed in the data appendix. In most of the analysis, we prefer to focus on current income as a proxy for long-run economic performance. Indeed, the comprehensive measures we have for growth usually cover less

than 5 decades which is too short in our view to assess long run effects.[2] We also found that the regression results are quite sensitive to changes in the length and period over which growth is measured. Income levels on the other hand better reflect long run growth over centuries since they would measure growth rates with a base of zero. Given that a couple of centuries back all countries were quite poor compared to today, this is not a bad approximation.

In addition to regressing income or growth on the principal components alone, we include a specification with a set of controls: absolute latitude, exposure to malaria (in 1994), the share of value added in mining in 1988 and the fraction of primary products in total exports in 1970. As one can see, the control set is limited to geographic variables or to measures of initial endowments. As a consequence, these variables are themselves less likely to have been affected by the institutions we measure than other variables commonly included as controls in cross-country income regressions.[3] In results not presented, we included a set of controls that have been shown to be robust to different cross-country income specifications (see Sala-i-Martin, 1997), but found that coefficients on our principal components, while they never changed sign, often (though not always) lost statistical significance. As this set of controls included mostly measures of human capital (primary school enrollment, life expectancy, capital per worker) in addition to an initial level of log GDP, and institutions at least partly determine human capital outcomes as well as economic performance, it is perhaps not surprising that institutions lose significance when these measures are included. For that reason, our preferred specifications include those controls that should be mostly free of the influence of institutions.

To be certain that multi-collinearity was not behind the lack of statistical significance of some of the principal components (in the case where we compute principal components for the three different categories of institutions) we ran each

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[2] Available measures of long-run income growth are not very accurate and exist for only a small set of countries (Maddison (2001); Maddison (2005)).

[3] Latitude is certainly unaffected by institutions. Expected malaria is a measure of exposure to the disease that is constructed to be free from the influence of human intervention (e.g., medicine). Exporting primary products and mining for gas and oil are activities which should not be completely free from the influence of institutions (the act of exporting requires at least a minimal institutional structure), but the bounds on their relative importance in overall economic activity is determined by the availability of the object being exported or mined.

specification (log income, growth; with controls, without; World Bank data, Penn World Tables data) with each principal component entering by itself. Results are detailed in the bottom panel of Tables 1 and 2 and are discussed below.

Table 1 presents the coefficients from a regression of income and income growth on seven principal components and our set of controls. The underlying variables making up the principal components are detailed in Table A1, where the variables making up an institutional category are shown along with their weight or loading on the principal components extracted from that category. For example, from the ten variables measuring what we considered to be political institutions, we extracted two principal components; from the eight variables measuring judicial institutions, we extracted two principal components; and from the thirteen variables measuring cultural institutions, we extracted three principal components. Together, these seven principal components are included as regressors in the specifications in Table 1.

From Table 1 we see that higher scores on the first cultural principal component (Cultural PC1) are associated with lower income on average, even after controlling for geography or endowments. Scoring higher on Cultural PC1 essentially means having a higher proportion of adherents of Islam, a higher proportion of people saying "Maintaining order in the nation" is important, and a lower proportion of people saying "Giving people more say in important government decisions" is important. It is thus easily interpreted as the effect of Islamic and authoritarian culture.

In the bottom panel of Table 1, we list each principal component that was significant in a regression of income or growth on only that principal component (with and without controls). If the sign of the coefficient changes when the principal component is entered alone, we indicate the new sign in parentheses after the abbreviation for the principal component. We see that the first political component, Political PC1, is significant as often as Cultural PC1 when it is the only regressor (for income levels) and has a positive sign. Political PC1 can be interpreted as a measure of limited powers of the executive. A higher score indicates the presence of a proportional electoral rule with competitive elections and a constrained executive (see table A1). The correlation between Cultural PC1 and Political PC1 is approximately -0.67 which makes intuitive sense. None of the principal components significantly affect recent growth in

income across all specifications. This lack of robustness continues when each principal component is entered individually.

In order to increase sample size, we reduce the number of variables in each category. In Table A2 we include only nine political, three judicial[4], and five cultural variables. This more than doubles our sample size in Table 2, where it is again Political PC1 and Cultural PC1 that are significant in explaining current income. Here, higher scores on Political PC1 still receive essentially the same interpretation of limitation of executive powers (more competitiveness in elections, a constrained executive, and a proportional electoral rule), bu now executive constraint and competitive elections are slightly more influential than proportional electoral rule.[5] Higher scores on Cultural PC1 now mean smaller numbers of Muslims. While Political PC1 is always significant for income levels, Cultural PC1 only seems significant in columns (1) and (2). Stated differently, though always significant and positive, the coefficient on Political PC1 is economically large in columns (3) and (4), but quite a bit smaller in columns (1) and (2). As before, the instability in both coefficients is likely due to their correlation: Political PC1 and Cultural PC1 from Table A2 have a correlation coefficient of approximately 0.61. Furthermore, when entered into the regressions individually and alone, both Political PC1 and Cultural PC1 coefficients are significant and positive. Essentially, this is a confirmation of our results from Table 1. Indeed, despite the removal of some variables from Table A1 to Table A2, Political PC1 and Cultural PC1 appear to be measuring similar things in both. Therefore, we can say with some confidence that a limited executive (limited both by rules governing tenure and how potential rivals gain power) and authoritarian cultural traits associated with an Islam are strongly associated with income levels.

Judicial PC1, which here is an indicator of British legal origin, is significant in columns (1) and (2) when controlling for other institutions, though not when entered by itself. In columns (5), (7), and (8), Judicial PC1 is significant when entered by itself,

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[4] In the strictest sense, there is only one judicial variable: a discrete multinomial indicating the origin of a country's legal system.
[5] In the previous set of variables, the influence of proportional electoral rule was more or less equal to the influence of competition and executive constraint.

though not when controlling for other institutions. Again, the judicial principal components seem to be less robust for predicting recent growth performance.

For Tables 3 through 5, we remove the classification by category of institutions and run a single factor analysis on all variables at once. We select the underlying variable set to keep the sample size as large as possible and to take advantage of the robust relationships between variables. The dependent variables, controls, tests, and summaries contained in the tables are exactly as described above for Tables 1 and 2.

The principal components in Table 3 are based on a small number of underlying variables (detailed in Table A3) to have a large sample size. Once again, a principal component (PC2) with significant contributions from executive constraints and proportional representation is significant and positive in specifications (1) through (4). PC2 is even significant (and positive) across the growth specifications (5) through (8). The last principal component, PC5, is also significant and positive for level specifications without controls and for all growth specifications. PC5 is a composite of an indicator for parliamentary systems and an index of the difficulty of changing a country's constitution. Notice that in Table A1 neither the parliamentary indicator nor the rigid constitution index contributed significantly to the principal components extracted from their respective categories. In Table A3, however, the two together describe a dimension of cross-country institutional variation that is significantly associated with income, and especially with recent trends in income growth.

In Table A4, new variables are added from each category. Table 4 demonstrates how these new variables change the nature of the principal components and in turn the interpretation of their coefficients. PC2 is again significant for income levels in all specifications (but only for the growth regressions which do not include controls). PC2 can still be described as a limited-executive type of principal component, but here the important variables include formal executive constraints and formal political rights of the population. To a lesser extent, a parliamentary regime and more adherents of Protestantism also increase the score on PC2. Before a measure of political rights was included, the limited executive PC tended to track formal executive constraints together with formal measures of electoral competition and the distribution of power in legislative bodies. The rigid constitution/parliamentary variable, PC5, continues to be significant in

all specifications for growth in and some level specifications. These two variables are plausible measures of checks on the power of governing bodies (see the data appendix), but constitutional rigidity is an important measure of institutional stability, a dimension that is somewhat orthogonal to executive constraints and crucial in its own right. Note that PC1, which is a composite of proportional rule, legal formalism, Catholicism and non-British legal origins is positively associated with income when all other institutions are held constant.

In Table A5, we add variables taken from the World Values Survey (WVS). Again, the composition of a few of the more familiar latent variables changes as does the interpretation of their coefficients (detailed in Table 5). As in most specifications, the limited executive PC, PC1, is significant across all of the income level specifications (columns (1) through (4)). PC1 still gets sizeable contributions from both the formal executive constraint variable and the political rights variable, but now also a WVS variable measuring the prevalence of secular values contributes in equal measure. A higher score on this limited executive PC also indicates proportional electoral rule, a familiar pattern from Tables A1, A2, and A3.

There is some indication that PC3 and PC4, both of which combine legal origin, religion, and cultural values measured by the WVS, are significant when other institutions and geographic factors are held constant. However, the coefficients on both of these principal components are negative in the level specifications (columns (1) through (4)) and then positive in the growth specifications (columns (5) through (8)).

Also, the content of these principal components is somewhat different from previous tables. In Table A1, for example, the principal component capturing Muslim influence (Cultural PC1) also captured places where WVS respondents desired a greater respect for authority, order in the nation, and more emphasis on the development of technology. The principal component capturing Muslim influence in Table A5 (PC4), in contrast, captures places where respondents desired *less* respect for authority and *less* emphasis on the development of technology. Since both of these principal components are significant (and had negative coefficients) in explaining income, we must exercise caution in interpretation. That is, there is some evidence (Tables A1 and A5) that higher scores on a latent variable combining higher percent Muslim with its covariates will

predict lower income, especially when other institutions are held constant. However, we are uncertain about how to describe the portion of institutional covariance that the Muslim latent variable has captured. To further complicate matters, there is evidence that a low percent Muslim can be contribute to *lower* income levels when other institutions are held constant (see columns (1) and (2) in Table 2), or that percent Muslim is simply not helpful in predicting income levels (see columns (1) through (4) in Table 4). In other words, depending on what variables principal component analysis chooses to pair with percent Muslim to explain covariance in institutions, the effect and significance of the latent variable containing percent Muslim can vary. There is thus no real robust result there.

To summarize, over several sets of variables and specifications, we have found that a limited executive principal component, capturing the formal constraints on executive action as well as covariates such as electoral competition, distribution of power in the legislative body, and political freedoms enjoyed by the general population, is strongly significant in predicting income levels. Though the constituents of the limited executive PC change when underlying variable sets are changed, its effect on income does not. In contrast, latent variables measuring cultural attributes are often significant, but their utility and the direction of their effects are highly dependent on the covariates included in the principal components. Principal components with significant contributions from judicial variables are less useful for predicting current income. Finally, though some of the principal components are significant predictors of recent income growth, their effects are typically less robust across specifications and time periods compared to the income regressions.

5. Robustness via Instrumental Variables

Any empirical treatment of income and institutions must recognize and control for potential omitted variable bias and endogeneity problems. In particular, richer countries may be able to "afford" institutions more conducive to growth in income. If that is indeed the case, variation in institutions may be producing variation in income while simultaneously being affected by variation in income.

We therefore performed instrumental variable estimation to see how the results would be affected. The identification strategies and specifications are again focused on robustness in the sense mentioned earlier: we look for principal components or factors that are robust to different samples, different income measures, and different sets of included variables and then instrument those principal components with two different instruments. The instruments are widely available and have been used frequently in the literature. Even though each instrument tells a different story in terms of causal mechanisms, we do not argue in favor of one or the other but are interested in whether our OLS results are confirmed or not.[6] We remain agnostic about whether the "true" coefficient on a particular principal component is closer to our OLS or IV estimate; we prefer to think of them as sample-specific bounds on estimates.

The first instrument we use is the log of settler mortality, from Acemoglu, Johnson, and Robinson (2001). This variable observes the estimated mortality of European-born soldiers, sailors, and bishops when stationed in European colonies before 1850. Acemoglu, Johnson, and Robinson (2001) find that variation in mortality rates for Europeans in European colonies is indeed correlated with institutional proxies (primarily a subset of the evaluative, survey-based proxies discussed above).[7] They argue that since these colonies were, at the time of early European expansion, essentially equal in per-capita income terms, settler mortality and early income are essentially independent variables in the settled colonies.

In our sample, we always observe both former colonies and nations that were never colonized, so using settler mortality as an instrument not only restricts sample size but also restricts our sample to a certain "type" of nation. There are good reasons for believing that institutions in the type of nation identified by the settler mortality variable might behave differently, or that the institutions themselves would be a different type, similar to the way education received in high student/teacher ratio classroom is different from education received in a low student/teacher classroom. To allow analysis of our

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[6] We do, however, believe them to be *conceptually* valid for the specifications we test. We tried other instruments suggested by the literature and available in our dataset like legal origin, an indicator for whether a nation was "new" after World War II, and an indicator for official state religion in 1900, but found them either lacking good statistical properties or theoretical justification or both.
[7] See however Albouy (2005).

entire sample and thereby estimate the most general coefficients possible, we make use of an additional instrument.

State history, an index which comes from Bockstette, Chanda, and Putterman (2002), measures the amount of time (between AD 1 and 1950) a present-day nation has had a government above the tribal level in control of or sovereign over most of the present-day territory with no foreign occupation or oversight. That is, it measures how long a nation has been a nation in the modern sense of the word. Importantly, there are no points added or subtracted for any characteristics like ethnic identity of the governing body, type of governing body, or rules by which the body governs.

We could not justify using this variable (as an instrument for institutions) across our entire sample. In the index, colonies are given lower scores for having been subject to foreign occupation and oversight. Whether a nation was colonized or a colonizer, in turn, is most likely correlated with income around the time of colonization. So, if used on the entire sample, the state history variable would not be uncorrelated with income, even after for controlling for institutions.

Instead, we use the state history variable as an instrument for those countries that were never colonized or that were colonized but nevertheless, according to the evidence available, were as rich or richer than the never-colonized and have long state histories relative to other colonial nations.[8] One of the attractive qualities of the settler mortality instrument is that it captures variation among colonies when incomes were essentially equal. We intend to use the state history variable in the same way: to pick up variation among a set of nations when income among them was essentially equal. In the set of nations described above, if we look back far enough, we should be able to imagine just such a period. In some nations wealth may have been waxing and in others waning, but for our identification strategy it does not matter. What matters is only that they were all equally rich at one time; since that time, some went on to become colonizers, some to finance colonization, some to resist colonization, and some to succumb to colonization. Basically, instead of choosing the set of early relatively-poor countries and watching their

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[8] In our sample, the latter are all nations formerly part of ancient empires in Mesopotamia, the Levant, the Maghreb, the Indian sub-continent, and southeast Asia. Their average length of state history and average settler mortality are about the 90th percentile and 10th percentile, respectively, of all colonies. The former are western European and east Asian nations.

(externally imposed) institutions lead them to a path of relative wealth or keep them in relative poverty, we choose the set of early relatively-rich countries and watch their (internally developed) institutions lead them to relative wealth or poverty.[9] The variable which we use as an instrument observes histories long enough to pick up this variation in old institutions, and as long as state history affects income only through choice of institutions, it is a valid instrument.

From Table 1, we take the first cultural principle component (Muslim, authoritarian values) which was significant in the level regressions (columns (1) through (4)) and some growth specifications (columns (6) and (8)) and instrument for it with the instruments described above. Results are in Table 6. We add in the geographic controls one at a time and then all together. Columns (1) through (6) suggest that settler mortality is correlated with the first cultural component (1st stage results are in the panel above; 2nd stage results below), while columns (7) through (12) suggest that state history is not. However, when the coefficients on any instrument in the first stage regression are significant or close to significant, the coefficient on the Cultural PC1 is highly significant and negative. In the specification without any controls, the size of the IV coefficient is appreciably larger than the OLS coefficient in Table 1 or the coefficient from an OLS regression of log GDP on this PC alone (not presented). For example, the IV coefficient on cultural PC1 in column (1) is about a standard deviation larger than the analogous OLS coefficient. The PCs themselves have no units and are complex linear combinations

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[9] The state history index gives lower scores to the rich nations that eventually became colonies, but these nations will not have become colonies due to their wealth per se. Nor will they have become colonies because they couldn't "afford" the institutions which would have protected them from colonization, for they were as rich as the never-colonized. On the contrary, it may have been their early wealth which made early statehood possible and the failure to augment that wealth which made later statehood untenable (in the face of colonization). Of course, knowledge of institutional technologies may have been different among these nations. However, all we need conceptually is for institutional development to have occurred within a set of constraints that did not include income. Even if the rich states that eventually became colonies had a set of institutions imposed from an earlier wave of colonization, it should not matter for identification Their state history scores assure us that they were relatively autonomous at very early dates and therefore should have had time within which to choose institutions to carry them forward, and we know they eventually became wealthy, and therefore had early institutions conducive to income growth. That is, they all at one point had, besides wealth, an institutional apparatus that made early statehood possible. And it is unreasonable to suppose that institutions imposed by later colonizers (Europeans) would have made nations susceptible to colonization. Therefore, if institutions varied among this set of nations before European colonization, this variation shouldn't correlate with variation in early wealth (measured at the appropriate time).

of the underlying variables, making interpretation of changes or variation difficult, but a one-standard deviation decrease in this variable is roughly equal to the distance between values of this component for Iran and Mexico!

In Tables 7a and 7b, we expand on the results from Table 2 using a smaller set of variables. We found a political and a cultural PC both significant in the level regressions (as well as some growth specifications). In Table 7a and 7b we take these two PCs in turn and again instrument for them. This time, both instruments appear to have significant correlation with the PC in most specifications. Again, the IV coefficients, when significant, are larger than either the OLS coefficients in Table 2 or OLS coefficients from a regression of income on those PCs alone (not presented). In Table 7a, there is confirmation that treating colonies and non-colonies separately may have some value. The IV coefficients in columns (7) through (12) are all lower than their counterparts in columns (1) through (6). The settler mortality instrument selects a sample of former colonies; when we use state history as an instrument, it is only on the sample of nations that were never colonies or were ancient empire colonies. So, there is an indication that institutions matter more for former colonies or recent nations. This difference in coefficients does not show up in analogous OLS regressions[10].

In Tables 8, 9, 10a, and 10b, we look at the clusters used in Tables 3 to 5. Table 8 presents IV results for the second cluster PC from Table 3 which was found significant in the level regressions and most growth specifications. Here, settler mortality fails to be a useful instrument, but state history fares better. Again, when significant, the IV coefficients are larger than the OLS coefficients. We also tried IV level regressions for the fifth cluster PC from Table 3 (which was primarily significant for the *growth* specifications) but none of the instruments were strongly correlated and the IV coefficients were almost never significant.

The clusters PCs in Table 4 widened the institutional net by including more political and cultural variables. Table 9 presents IV level regressions for cluster PC2, which was significant in the level regressions (and again, in some growth specifications). The first stage correlation between state history and cluster PC2 is quite weak, while that between settler mortality is stronger. Once again, whenever the IV coefficients on cluster

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[10] Tests of PC coefficient equality between the two samples are never rejected in the OLS case.

PC2 are significant, they are considerably larger than the OLS coefficients. Again there are noticeable differences between IV coefficients in the colonies sample (where settler mortality is used as the instrument) and the never-colonized/ancient empire colony sample (where state history is used as the instrument).

Finally, tables 10a and 10b present IV level regressions for the two cluster PCs found significant when we used the largest number of variables (see Table 5). On cluster PC1 in Table 10a (limited executive, political freedom, secularism), both instruments work well for their respective samples. The pattern for IV coefficients is repeated: when significant, they are larger in magnitude than the OLS coefficients.

In Table 5, one of the PCs loading heaviest on percent Muslim, cluster PC4, is significant (though small) after controlling for a cluster PC reflecting executive constraints, political freedoms, and degree of secularism. Table 10b confirms that cluster PC4 is highly significant, large, and negative when it is the only institution in an income regression. This result again suggests caution in interpretation: variables that appear quite significant when entered alone can lose some punch when the regression conditions on a comprehensive set of institutions

Conclusion.

When performing factor analysis to determine the effect of different institutions on economic performance, we find one robust result: a limited executive with checks and balances, together with an anti-authoritarian culture are associated with long run growth and have a causal effect. This effect is even stronger when our institutional variables are instrumented for. Other institutions, including legal origins, do not appear in general to have an effect on growth and income. Our results show that it is not one specific institution but rather a broad set of institutions of separation of powers that matters. While political institutions appear the most important, there is sufficient evidence that they are intertwined with a democratic and participatory culture. This qualification is not trivial because it suggests that while political institutions can change rapidly, they need to be supported by a set of values and beliefs that is supported by sufficiently large parts of

the population. This has important policy implications and suggests caution when advocating sweeping political changes in a country.

Note that the results on institutions are not results on the size of government but rather on the limits to executive power and on the checks and balances within government. Intuitively, and in line with the literature on institutions, these are political institutions that favor protection of private property rights and limit government encroachment on the private sector.

There are still various reasons for treating these results with caution. A major reason for caution is that the best available data on culture, those from the World Values Survey, are available for a smaller set of countries than the typical data we have on political institutions. This might lead to a too strong emphasis on political institutions relative to culture.

This exercise is clearly only one of the first ones trying to disentangle the effect of various institutions. We have not analyzed the interaction between institutions: does culture cause political institutions or vice versa? Does institutional change in one dimension create momentum effects and how? Analyzing these interactions is a very challenging but important task. Large cross-country studies are not the best suited to analyze these questions. More precise questions need to be asked and analyzed within specific contexts where we can capture situations that are as close as possible to natural experiments. An exercise like the one performed in this paper is mostly helpful because by singling out more precisely the institutions relevant for growth, it may help to direct the focus of further research on better controlled analysis of the effect of institutions and their interactions.

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Table 1: Institutional Categories I - large underlying variable set

Dependent Variable:	Real per-capita GDP (log)					Real per-capita GDP growth			
	Summers-Heston, 2000		World Bank, 2002			Summers-Heston, at least 40 years		World Bank, 27 years (1975-2002)	
	(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)
Political PC1: limited executive	-0.137	-0.035	-0.111	0.034		0.001	0.004	-0.001	0.006
	(0.78)	(0.27)	(0.61)	(0.24)		(0.22)	(1.11)	(0.11)	(1.02)
Political PC2: proportional representation	-0.118	-0.014	-0.108	-0.006		-0.001	0.001	0.003	0.008
	(0.83)	(0.14)	(0.73)	(0.05)		(0.47)	(0.43)	(0.72)	(1.70)
Judicial PC1: common law, independent judiciary	-0.165	-0.073	-0.100	-0.010		-0.005	-0.004	-0.003	-0.004
	(1.00)	(0.65)	(0.58)	(0.08)		(1.35)	(1.29)	(0.60)	(0.69)
Judicial PC2: French legal origin	-0.063	-0.103	-0.055	-0.088		-0.000	-0.002	0.000	-0.006
	(0.43)	(0.91)	(0.36)	(0.72)		(0.05)	(0.64)	(0.02)	(1.09)
Cultural PC1: Muslim, authoritarian	-0.878**	-0.390*	-0.891**	-0.323+		-0.000	0.009+	0.002	0.017*
	(6.05)	(2.48)	(5.94)	(1.90)		(0.08)	(1.93)	(0.39)	(2.29)
Cultural PC2: non-Catholic, high levels of trust	0.125	-0.005	0.120	-0.045		0.003	0.002	0.004	0.002
	(1.17)	(0.07)	(1.09)	(0.55)		(1.30)	(0.88)	(1.31)	(0.55)
Cultural PC3: religious fractionalization, secular values	0.155	-0.011	0.177	0.043		0.006	0.003	0.000	-0.004
	(0.77)	(0.07)	(0.85)	(0.24)		(1.44)	(0.55)	(0.05)	(0.57)
Controls	No	Yes	No	Yes		No	Yes	No	Yes
Observations	34	32	34	32		33	32	34	32
R^2	0.74	0.92	0.74	0.91		0.21	0.54	0.09	0.38
F statistic: Null = all PCs jointly zero	10.52	2.81	10.51	2.55		0.95	1.03	0.36	1.30
Prob>F	0.00	0.03	0.00	0.05		0.49	0.44	0.91	0.30
PCs statistically significant individually	p1(+), c1	p1(+), c1	p1(+), c1	p1, c1, c3		c2, c3		p2	c1

Absolute value of t statistics in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%

Table 2: Institutional Categories II - small underlying variable set

Dependent Variable:	Real per-capita GDP (log)					Real per-capita GDP growth			
	Summers-Heston, 2000		World Bank, 2002			Summers-Heston, at least 40 years		World Bank, 27 years (1975-2002)	
	(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)
Political PC1: checks and balances	0.008**	0.006*	0.557**	0.246*		0.005+	0.002	0.795**	0.503**
	(2.79)	(2.21)	(3.31)	(2.01)		(1.89)	(1.02)	(3.93)	(3.48)
Political PC2: proportional representation	-0.001	-0.004	0.195	-0.026		0.000	-0.002	0.086	-0.122
	(0.54)	(1.58)	(1.20)	(0.22)		(0.11)	(1.07)	(0.50)	(1.00)
Judicial PC1: British legal origin	0.006*	0.005+	0.177	-0.045		0.004	0.001	0.122	-0.116
	(2.19)	(1.92)	(1.05)	(0.40)		(1.39)	(0.30)	(0.69)	(0.98)
Cultural PC1: non-Muslim	-0.008*	-0.010**	0.147	-0.019		-0.002	-0.006**	0.033	-0.155
	(2.38)	(3.27)	(0.76)	(0.13)		(0.90)	(2.82)	(0.17)	(1.16)
Controls	No	Yes	No	Yes		No	Yes	No	Yes
Observations	68	66	79	68		61	58	71	61
R^2	0.23	0.42	0.27	0.73		0.12	0.55	0.32	0.77
F statistic: Null = all PCs jointly zero	4.62	5.26	6.76	1.43		1.96	2.65	7.90	3.44
Prob>F	0.00	0.00	0.00	0.23		0.11	0.04	0.00	0.01
PCs statistically significant individually?	p1, c1(+)	p1, c1(+)	p1, c1	p1, c1(+)		p1, j1(+)	c1	p1, j1	p2, j1(+)

Absolute value of t statistics in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%

Table 3: Institutional Clusters I - small underlying variable set

Dependent Variable:	Real per-capita GDP (log)					Real per-capita GDP growth			
	Summers-Heston, 2000		World Bank, 2002			Summers-Heston, at least 40 years		World Bank, 27 years (1975-2002)	
	(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)
PC1: British legal origin, independent judiciary	-0.011	0.009	-0.007	0.001		0.000	0.001	0.002+	0.003*
	(0.17)	(0.18)	(0.10)	(0.02)		(0.41)	(0.85)	(1.83)	(2.17)
PC2: limited executive	0.552**	0.220*	0.534**	0.223*		0.005**	0.003*	0.004**	0.004*
	(6.53)	(2.60)	(6.38)	(2.67)		(4.48)	(2.09)	(2.87)	(2.03)
PC3: French legal origin	-0.070	-0.036	-0.068	-0.028		-0.002+	-0.000	-0.002	-0.002
	(0.72)	(0.43)	(0.67)	(0.32)		(1.78)	(0.35)	(1.08)	(1.09)
PC4: strong judiciary	-0.128	0.003	-0.120	0.020		0.002	0.002	0.002	0.002
	(1.17)	(0.04)	(1.04)	(0.24)		(1.48)	(1.46)	(0.77)	(0.79)
PC5: rigid constitution, parliamentary regime	0.208+	-0.048	0.237*	-0.064		0.003+	0.003*	0.005*	0.006*
	(1.90)	(0.55)	(2.08)	(0.68)		(1.76)	(2.14)	(2.49)	(2.41)
Controls	No	Yes	No	Yes		No	Yes	No	Yes
Observations	54	51	55	52		54	51	52	50
R^2	0.53	0.78	0.51	0.77		0.37	0.48	0.30	0.37
F statistic: Null = all PCs jointly zero	10.92	1.59	10.24	1.79		5.53	2.05	3.90	2.61
Prob>F	0.00	0.19	0.00	0.14		0.00	0.09	0.01	0.04

Absolute value of t statistics in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%

Table 4: Institutional Clusters II - medium underlying variable set

Dependent Variable:	Real per-capita GDP (log)					Real per-capita GDP growth			
	Summers-Heston, 2000		World Bank, 2002			Summers-Heston, at least 40 years		World Bank, 27 years (1975-2002)	
	(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)
PC1: proportional representation, French legal origin, legally formal, Catholic	0.134**	0.055	0.119*	0.058		0.001	-0.000	-0.000	-0.002
	(2.75)	(1.43)	(2.18)	(1.34)		(0.90)	(0.43)	(0.40)	(1.34)
PC2: constrained executive, political participation, Protestant	0.432**	0.160*	0.413**	0.128+		0.003**	0.002	0.003*	0.002
	(7.73)	(2.58)	(6.99)	(1.92)		(3.25)	(1.45)	(2.16)	(1.06)
PC3: large district magnitude, French legal origin, Muslim	0.079	0.001	0.109	-0.012		0.001	0.003*	0.001	0.002
	(1.00)	(0.02)	(1.30)	(0.17)		(0.87)	(2.52)	(0.51)	(0.94)
PC4: non-German legal origin, independent High Court, Catholic	0.025	0.011	-0.005	0.014		-0.003*	-0.002*	-0.003	-0.004+
	(0.31)	(0.17)	(0.05)	(0.20)		(2.34)	(2.04)	(1.46)	(1.95)
PC5: rigid constitution, parliamentary regime	0.240*	0.093	0.268*	0.115		0.004*	0.003*	0.006**	0.006*
	(2.58)	(1.33)	(2.64)	(1.51)		(2.25)	(2.66)	(2.83)	(2.59)
PC6: strong judiciary, independent Admin. Courts	-0.110	-0.015	-0.103	0.002		0.002	0.001	-0.000	0.000
	(1.13)	(0.20)	(0.97)	(0.03)		(1.48)	(1.03)	(0.13)	(0.05)
Controls	No	Yes	No	Yes		No	Yes	No	Yes
Observations	49	46	49	46		49	46	47	45
R^2	0.65	0.83	0.60	0.81		0.37	0.59	0.28	0.41
F statistic: Null = all PCs jointly zero	13.02	1.48	10.65	1.11		4.03	3.22	2.56	2.23
Prob>F	0.00	0.21	0.00	0.38		0.00	0.01	0.03	0.06

Absolute value of t statistics in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%

Table 5: Institutional Clusters III - large underlying variable set

Dependent Variable:	Real per-capita GDP (log)					Real per-capita GDP growth			
	Summers-Heston, 2000		World Bank, 2002			Summers-Heston, at least 40 years		World Bank, 27 years (1975-2002)	
	(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)
PC1: limited executive, political participation, secular values	0.373**	0.153**	0.387**	0.165**		0.003**	0.001	0.001	-0.002
	(10.82)	(3.37)	(11.02)	(3.51)		(3.66)	(0.50)	(0.52)	(1.08)
PC2: French legal origin, legally formal, Catholic	-0.022	0.034	-0.040	0.017		-0.000	-0.000	-0.002	-0.001
	(0.55)	(0.99)	(1.03)	(0.49)		(0.07)	(0.12)	(1.41)	(0.88)
PC3: German legal origin, dependent High Court, Buddhist, Protestant ethic	-0.126*	-0.025	-0.140**	-0.040		0.003*	0.002+	0.002	0.003
	(2.64)	(0.63)	(3.04)	(1.03)		(2.57)	(1.95)	(1.33)	(1.52)
PC4: large district magnitude, Muslim, non-authoritarian, anti-technology	-0.088	-0.111*	-0.117*	-0.136**		0.000	0.001	0.001	0.001
	(1.63)	(2.62)	(2.24)	(3.30)		(0.04)	(1.30)	(0.46)	(0.57)
PC5: rigid constitution, parliamentary regime	0.194**	0.001	0.166*	-0.018		0.002	0.001	0.003	0.001
	(2.97)	(0.01)	(2.64)	(0.34)		(1.42)	(0.82)	(1.58)	(0.29)
PC6: rule of law	-0.000	-0.035	0.011	-0.016		-0.001	0.000	0.002	0.002
	(0.01)	(0.67)	(0.16)	(0.29)		(0.87)	(0.22)	(0.95)	(0.96)
Controls	No	Yes	No	Yes		No	Yes	No	Yes
Observations	40	38	39	37		40	38	38	36
R^2	0.81	0.92	0.82	0.92		0.41	0.56	0.21	0.31
F statistic: Null = all PCs jointly zero	22.91	4.00	24.38	4.60		3.80	1.55	1.35	1.07
Prob>F	0.00	0.01	0.00	0.00		0.01	0.20	0.27	0.41

Absolute value of t statistics in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%

Table 6: Instrumental Variable Regression - Cultural PC1 from large variable set (Table A1)

1st Stage - Cultural PC1 (*muslim, authoritarian*) on:

	instrument **settler mortality (log)**							instrument **state history**					
instrument	0.327*	0.152	0.269	0.361*	0.378*	0.274		-1.527	-0.205	-0.475	-1.370	0.960	1.006
	(2.58)	(0.75)	(1.53)	(2.68)	(2.40)	(1.20)		(1.31)	(0.24)	(0.66)	(1.26)	(0.86)	(1.36)
	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)

2nd Stage – **log Real per-capita GDP** (Summers-Heston, 2000) on*:*

	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)
Cultural PC1	**-1.861****	**-1.431**	**-1.549***	**-1.788****	**-1.550****	**-0.937**		**-1.057****	**-1.901**	**-1.597**	**-1.101****	**-0.111**	**-0.294**
	(3.44)	**(1.04)**	**(2.12)**	**(3.56)**	**(3.25)**	**(1.72)**		**(3.06)**	**(0.33)**	**(0.96)**	**(2.83)**	**(0.12)**	**(0.59)**
Expected Malaria		-0.768				-1.371			3.974				-1.626*
		(0.37)				(1.65)			(0.16)				(2.21)
Latitude (abs. value)			1.203			0.043				-4.391			1.491
			(0.62)			(0.03)				(0.46)			(0.72)
Share of GDP in mining (incl. oil and gas), 1988				-1.931		1.515					7.742		3.308
				(0.42)		(0.60)					(1.02)		(1.04)
% primary products in total exports, 1970					-0.836	-0.539						-1.380	-0.400
					(1.07)	(0.78)						(0.67)	(0.61)
Constant	8.841**	9.039**	8.472**	8.915**	9.350**	9.455**		9.204**	8.641*	11.138*	9.031**	10.052**	8.939**
	(35.84)	(16.47)	(13.24)	(29.00)	(16.27)	(11.06)		(91.46)	(2.45)	(2.70)	(39.69)	(8.61)	(14.65)
Obs.	28	28	28	28	27	27		31	31	31	30	29	29
R^2		0.36	0.23		0.26	0.77		0.73		0.44	0.74	0.45	0.85

Absolute value of t statistics in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%

Table 7a: Instrumental Variable Regression - Political PC1 from small variable set (Table A2)

1st Stage - Political PC1 (*checks and balances*) on:

	instrument **settler mortality (log)**						instrument **state history**					
instrument	-0.195*	-0.237+	-0.223*	-0.192*	-0.177+	-0.231	2.687*	2.300*	2.212*	2.104+	0.672	0.519
	(2.56)	(1.70)	(2.19)	(2.48)	(1.76)	(1.43)	(2.61)	(2.14)	(2.10)	(1.95)	(0.61)	(0.45)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

2nd Stage – **log Real per-capita GDP** (Summers-Heston, 2000) on*:

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Political PC1	**3.026***	**1.541**	**2.016***	**3.137***	**3.046+**	**1.299**	**0.970***	**0.549***	**0.632+**	**1.118***	**0.046**	**0.826**
	(2.60)	**(1.62)**	**(2.20)**	**(2.55)**	**(1.79)**	**(1.39)**	**(2.75)**	**(2.15)**	**(1.98)**	**(2.12)**	**(0.04)**	**(0.52)**
Expected Malaria		-1.338+				-0.864		-2.583**				-2.008
		(1.86)				(1.08)		(4.89)				(1.11)
Latitude (abs. value)			2.698			2.409			2.565**			1.138
			(1.68)			(1.32)			(3.09)			(1.00)
Share of GDP in mining (incl. oil and gas), 1988				7.416		-0.044				5.552		0.456
				(1.03)		(0.04)				(0.72)		(0.11)
% primary products in total exports, 1970					-0.087	6.473+					-2.165	6.187
					(0.04)	(1.85)					(0.79)	(1.45)
Constant	8.544**	9.082**	7.893**	8.239**	8.604**	8.076**	9.159**	9.596**	8.134**	8.991**	10.434**	8.620**
	(26.69)	(26.53)	(17.90)	(18.82)	(5.16)	(5.43)	(58.83)	(70.44)	(24.48)	(29.29)	(6.60)	(3.76)
Obs.	42	42	42	42	40	40	30	30	30	29	28	28
R²		0.00				0.33	0.32	0.77	0.67	0.22	0.58	0.68

Absolute value of t statistics in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%

Table 7b: Instrumental Variable Regression - Cultural PC1 from small variable set (Table A2)

1st Stage - Cultural PC1 (*non-muslim*) on:

	instrument **settler mortality (log)**						instrument **state history**					
instrument	-0.158*	0.026	-0.282**	-0.165*	-0.159+	-0.039	2.317*	1.694+	1.744*	1.863+	0.127	0.392
	(2.00)	(0.19)	(2.99)	(2.03)	(1.74)	(0.29)	(2.39)	(2.00)	(2.09)	(2.00)	(0.14)	(0.44)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

2nd Stage – **log Real per-capita GDP** (Summers-Heston, 2000) on:

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Cultural PC1	**3.780***	**-11.197**	**1.685***	**3.751***	**3.493+**	**7.298**	**0.680***	**0.376**	**0.434**	**0.745+**	**-5.149**	**0.054**
	(2.06)	**(0.19)**	**(3.11)**	**(2.07)**	**(1.78)**	**(0.30)**	**(2.07)**	**(1.05)**	**(1.21)**	**(1.77)**	**(0.13)**	**(0.03)**
Expected Malaria		-10.433				6.642		-2.711*				-1.560
		(0.24)				(0.24)		(2.60)				(1.55)
Latitude (abs. value)			5.149**			23.070			2.877*			2.132
			(4.50)			(0.32)			(2.27)			(1.01)
Share of GDP in mining (incl. oil and gas), 1988				-1.994		-1.892				4.247		-0.804
				(0.27)		(0.07)				(0.61)		(0.28)
% primary products in total exports, 1970					-1.010	6.395					-13.147	5.291
					(0.56)	(0.27)					(0.15)	(0.48)
Constant	8.232**	12.808	7.240**	8.387**	8.951**	-4.692	9.361**	9.690**	8.094**	9.268**	14.920	8.847**
	(22.55)	(0.68)	(26.74)	(16.75)	(5.82)	(0.10)	(57.20)	(79.40)	(12.65)	(57.51)	(0.41)	(10.55)
Obs.	71	64	71	68	67	61	38	38	38	37	36	36
R²							0.49	0.70	0.67	0.50		0.68

Absolute value of t statistics in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%

Table 8: Instrumental Variable Regression - Cluster PC2 from small variable set (Table A3)

1ˢᵗ Stage - Cluster PC2 (*limited executive*) on:

	instrument **settler mortality (log)**						instrument **state history**					
instrument	-0.196	0.028	-0.118	-0.196	-0.113	0.063	3.440*	2.202	1.971	2.759+	0.422	0.597
	(1.32)	(0.12)	(0.59)	(1.30)	(0.60)	(0.24)	(2.17)	(1.49)	(1.39)	(1.72)	(0.28)	(0.38)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

2ⁿᵈ Stage – **log Real per-capita GDP** (Summers-Heston, 2000) on*:*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Cluster PC2	**2.883**	**-4.011**	**2.364**	**2.888**	**3.705**	**-1.127**	**0.744***	**0.505**	**0.572**	**0.883***	**-0.265**	**0.503**
	(1.42)	**(0.11)**	**(0.64)**	**(1.39)**	**(0.63)**	**(0.19)**	**(2.72)**	**(1.52)**	**(1.34)**	**(2.27)**	**(0.09)**	**(0.37)**
Expected Malaria		-8.102				-2.975		-1.950				-1.661
		(0.18)				(0.44)		(1.59)				(1.52)
Latitude (abs. value)			1.055			1.278			1.651			0.356
			(0.19)			(0.27)			(0.79)			(0.11)
Share of GDP in mining (incl. oil and gas), 1988				-5.108		8.118				6.901		8.432+
				(0.38)		(0.38)				(0.94)		(1.94)
% primary products in total exports, 1970					1.292	-1.315					-3.222	-0.560
					(0.21)	(0.26)					(0.37)	(0.18)
Constant	9.633**	10.024**	9.209**	9.837**	8.895*	9.694*	8.839**	9.251**	8.244**	8.630**	11.111+	9.170**
	(11.35)	(3.23)	(3.65)	(8.39)	(2.71)	(2.21)	(41.56)	(24.81)	(12.46)	(22.42)	(1.83)	(7.50)
Obs.	30	30	30	30	29	29	31	31	31	30	29	29
R^2							0.44	0.70	0.60	0.37	0.29	0.73

Absolute value of t statistics in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%

Table 9: Instrumental Variable Regression - Cluster PC2 from medium variable set (Table A4)

1st Stage - Cluster PC2 (*limited executive, political freedom*) on:

	instrument **settler mortality (log)**							instrument **state history**					
instrument	-0.633**	-0.505	-0.348	-0.637**	-0.462+	-0.431		3.513	1.453	1.364	2.945	0.213	0.309
	(3.18)	(1.46)	(1.29)	(3.16)	(1.81)	(1.14)		(1.62)	(0.69)	(0.74)	(1.34)	(0.10)	(0.15)
	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)

2nd Stage – **log Real per-capita GDP** (Summers-Heston, 2000) on*:*

	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)
Cluster PC2	**0.936****	**0.288**	**1.069**	**0.928****	**1.090+**	**0.323**		**0.737***	**0.730**	**1.082**	**0.804+**	**4.041**	**2.333**
	(3.15)	**(0.98)**	**(1.25)**	**(3.15)**	**(1.80)**	**(0.81)**		**(2.18)**	**(0.82)**	**(0.81)**	**(1.75)**	**(0.10)**	**(0.15)**
Expected Malaria		-2.320*				-1.936*			-0.046				-5.869
		(2.68)				(2.53)			(0.01)				(0.20)
Latitude (abs. value)			-0.830			0.647				-3.284			-12.321
			(0.20)			(0.35)				(0.39)			(0.14)
Share of GDP in mining (incl. oil and gas), 1988				4.858		2.314					5.453		-11.265
				(0.89)		(0.76)					(0.54)		(0.11)
% primary products in total exports, 1970					0.805	0.212						12.396	4.962
					(0.42)	(0.28)						(0.09)	(0.13)
Constant	9.277**	9.720**	9.547**	9.077**	8.770**	9.219**		8.970**	8.981**	10.169**	8.826**	0.858	11.926
	(32.59)	(47.87)	(6.66)	(26.43)	(7.05)	(10.30)		(29.45)	(8.06)	(3.70)	(16.22)	(0.01)	(0.75)
Obs.	27	27	27	27	26	26		27	27	27	26	25	25
R^2		0.70				0.68							

Absolute value of t statistics in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%

Table 10a: Instrumental Variable Regression - Cluster PC1 from large variable set (Table A5)

1st Stage - Cluster PC1 (*limited executive, political freedom, secularism*) on:

	instrument **settler mortality (log)**						instrument **state history**					
instrument	-0.648*	0.082	-0.506	-0.657*	-0.362	0.093	7.012*	3.225	4.343+	6.655*	2.231	0.508
	(2.56)	(0.21)	(1.32)	(2.54)	(1.13)	(0.21)	(2.78)	(1.43)	(1.90)	(2.52)	(0.94)	(0.22)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

2nd Stage - **log Real per-capita GDP** (Summers-Heston, 2000) on*:*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Cluster PC1	**0.911****	**-0.868**	**0.699+**	**0.906****	**1.357**	**-0.803**	**0.374****	**0.201**	**0.280***	**0.359****	**0.329**	**-0.155**
	(3.28)	**(0.17)**	**(1.75)**	**(3.23)**	**(1.30)**	**(0.16)**	**(4.29)**	**(1.42)**	**(2.34)**	**(3.77)**	**(1.01)**	**(0.11)**
Expected Malaria		-6.275				-4.819		-2.166+				-2.731
		(0.33)				(0.31)		(1.87)				(0.44)
Latitude (abs. value)			1.335			-0.442			1.841			1.852
			(0.70)			(0.04)			(1.56)			(0.61)
Share of GDP in mining (incl. oil and gas), 1988				-1.564		3.055				-3.014		9.042
				(0.28)		(0.16)				(0.76)		(0.27)
% primary products in total exports, 1970					1.751	-1.692					-0.245	-1.993
					(0.54)	(0.15)					(0.13)	(0.28)
Constant	9.756**	10.029**	9.184**	9.817**	8.837**	10.920	9.289**	9.602**	8.490**	9.363**	9.450**	9.710**
	(27.25)	(8.67)	(10.28)	(21.65)	(5.69)	(0.98)	(82.63)	(46.13)	(17.41)	(60.79)	(9.08)	(3.77)
Obs.	20	20	20	20	19	19	25	25	25	24	23	23
R^2	0.02		0.46	0.03			0.70	0.87	0.82	0.71	0.65	0.73

Absolute value of t statistics in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%

Table 10b: Instrumental Variable Regression - Cluster PC4 from large variable set (Table A5)

1st Stage - Cluster PC4 (*muslim, protestant, anti-authoritarian values*) on:

	instrument **settler mortality (log)**							instrument **state history**					
instrument	0.528*	0.643	0.327	0.504*	0.306	0.504		-4.225*	-3.703+	-4.503*	-3.376*	-1.813	-1.916
	(2.41)	(1.65)	(1.00)	(2.43)	(0.99)	(1.16)		(2.49)	(1.92)	(2.42)	(2.14)	(0.95)	(1.05)
	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)

2nd Stage - **log Real per-capita GDP** (Summers-Heston, 2000) on:

	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)
Cluster PC4	**-1.118***	**-0.111**	**-1.083**	**-1.181***	**-1.606**	**-0.148**		**-0.621+**	**-0.175**	**-0.270**	**-0.708**	**-0.405**	**0.041**
	(2.33)	**(0.54)**	**(0.94)**	**(2.44)**	**(0.98)**	**(0.49)**		**(1.91)**	**(0.93)**	**(1.64)**	**(1.56)**	**(0.59)**	**(0.16)**
Expected Malaria		-2.893**				-2.300**			-3.359**				-2.223+
		(5.87)				(3.81)			(5.18)				(1.86)
Latitude (abs. value)			0.181			1.139				4.127**			1.304
			(0.04)			(0.84)				(5.81)			(0.78)
Share of GDP in mining (incl. oil and gas), 1988				15.259		1.794					10.572		5.032
				(1.64)		(0.43)					(0.68)		(1.14)
% primary products in total exports, 1970					1.789	0.212						-0.616	-1.370
					(0.41)	(0.31)						(0.24)	(1.50)
Constant	8.363**	9.743**	8.329**	7.689**	6.918+	9.034**		9.825**	9.925**	7.731**	9.635**	10.065**	9.609**
	(21.00)	(38.18)	(9.51)	(11.95)	(1.81)	(11.82)		(37.90)	(85.76)	(20.79)	(32.00)	(12.90)	(8.27)
Obs.	20	20	20	20	19	19		25	25	25	24	23	23
R^2		0.83				0.85			0.70	0.63			0.87

Absolute value of t statistics in parentheses; + significant at 10%; * significant at 5%; ** significant at 1%

Appendix

Table A1: Structure of principal components used in Table 1

Political Variables Used:	Loadings			**Judicial** Variables Used:	Loadings			**Cultural** Variables Used:	Loadings		
	PC1	PC2			PC1	PC2			PC1	PC2	PC3
Executive Finite Term	0.49	0.28		British legal origins	**0.72**	-0.28		Catholic adherents, %	-0.46	**-0.68**	-0.17
Legislative electoral competitiveness index	0.45	0.21		French legal origins	**-0.63**	**0.61**		Protestant adherents, %	-0.42	**0.59**	0.01
Executive electoral competitiveness index	**0.64**	0.48		German legal origins	0.03	-0.25		Muslim adherents, %	**0.64**	0.16	-0.50
Parliamentary regime	0.33	0.36		Case law	**0.66**	-0.25		Eastern adherents, %	0.15	0.25	0.25
Executive Constraints, 2002	**0.78**	0.37		Tenure of High Court judges	**0.70**	0.51		Religious fractionalization	0.03	0.03	**0.59**
Autonomous regions	0.14	-0.11		Tenure of administrative court judges	**0.75**	0.44		Trust	-0.33	**0.70**	0.02
District magnitude	**0.61**	**-0.63**		Judicial review	0.27	0.24		Order	**0.73**	0.25	0.25
Proportional electoral rule	**0.74**	-0.39		Rigidity of constitution	0.00	0.15		Voice	**-0.76**	-0.13	-0.02
State/Province elections	0.35	0.19						Social protection	0.12	-0.36	0.30
% of representatives elected on a party list	**0.72**	-0.46						Anti-corruption	0.03	0.37	-0.44
								Secular values	-0.23	0.12	**0.56**
								Protestant ethic	0.42	0.11	0.22
								Authoritarian; pro-technology	0.49	-0.49	0.04

Table A2: Structure of principal components used in Table 2

Political Variables Used:	Loadings	
	PC1	PC2
Executive Finite Term	**0.63**	-0.26
Legislative electoral competitiveness index	**0.64**	-0.10
Executive electoral competitiveness index	**0.78**	-0.26
Parliamentary regime	0.40	-0.23
Executive Constraints, 2002	**0.77**	-0.07
Autonomous regions	0.13	0.08
District magnitude	0.35	**0.67**
Proportional electoral rule	0.57	**0.61**
State/Province elections	0.45	-0.04

Judicial Variables Used:	Loadings
	PC1
British legal origins	**0.74**
French legal origins	**-0.74**
German legal origins	0.02

Cultural Variables Used:	Loadings
	PC1
Catholic adherents, %	0.52
Protestant adherents, %	0.38
Muslim adherents, %	**-0.85**
Eastern adherents, %	-0.10
Religious fractionalization	0.36

Table A3: Structure of principal components used in Table 3

Variables Used:	Loadings				
	PC1	PC2	PC3	PC4	PC5
Parliamentary regime	0.21	0.35	-0.11	-0.22	**0.54**
Proportional electoral rule	-0.29	**0.48**	0.08	-0.02	-0.13
District magnitude	-0.32	0.36	0.18	-0.04	-0.03
Executive Constraints, 2002	0.05	**0.52**	0.10	-0.11	-0.08
British legal origins	**0.47**	-0.11	-0.23	-0.13	-0.16
French legal origins	-0.39	-0.21	**0.50**	0.07	0.16
German legal origins	-0.11	0.33	**-0.54**	0.15	-0.12
Tenure of High Court judges	**0.43**	0.20	0.41	0.17	0.09
Tenure of administrative court judges	**0.43**	0.16	0.36	0.19	0.01
Judicial review	0.03	0.08	-0.03	**0.78**	-0.33
Rigidity of constitution	-0.10	-0.03	-0.21	**0.47**	**0.71**

Table A4: Structure of principal components used in Table 4

Variables Used:	Loadings					
	PC1	PC2	PC3	PC4	PC5	PC6
Parliamentary regime	-0.10	0.35	0.17	-0.07	**0.42**	-0.24
Proportional electoral rule	**0.35**	0.26	0.12	0.02	-0.12	0.03
District magnitude	0.28	0.18	**0.40**	-0.12	-0.22	0.15
Executive Constraints, 2002	0.15	**0.42**	-0.04	0.28	0.09	-0.04
Political Rights, 2000	0.19	**0.42**	-0.04	0.19	0.17	-0.04
Legal formalism index	**0.35**	-0.27	0.05	0.14	-0.02	0.05
British legal origins	**-0.39**	0.04	-0.36	0.16	0.05	-0.14
French legal origins	0.31	-0.31	0.33	0.18	0.14	-0.12
German legal origins	0.11	0.20	-0.16	**-0.50**	-0.10	0.34
Tenure of High Court judges	-0.29	0.08	0.32	**0.40**	0.15	0.28
Tenure of administrative court judges	-0.30	0.06	0.30	0.28	-0.05	**0.43**
Judicial review	0.11	-0.12	-0.30	0.06	0.17	**0.70**
Rigidity of constitution	0.08	0.03	0.06	-0.33	**0.72**	0.12
Catholic adherents, %	**0.35**	-0.15	-0.21	0.35	0.14	-0.05
Protestant adherents, %	-0.05	0.31	0.10	-0.05	-0.31	0.04
Muslim adherents, %	-0.19	-0.25	**0.44**	-0.26	0.07	-0.04

Table A5: Structure of principal components used in Table 5

Variables Used:	Loadings					
	PC1	PC2	PC3	PC4	PC5	PC6
Parliamentary regime	0.21	-0.22	-0.09	0.09	**0.39**	0.19
Proportional electoral rule	**0.33**	0.18	0.00	0.13	-0.09	-0.06
District magnitude	0.24	0.23	0.06	**0.38**	-0.16	-0.18
Executive Constraints, 2002	**0.36**	-0.01	-0.22	-0.11	-0.08	-0.07
Political Rights, 2000	**0.38**	-0.04	-0.19	-0.20	-0.07	-0.02
Legal formalism index	-0.07	**0.43**	-0.05	0.11	-0.13	0.10
British legal origins	-0.18	-0.34	-0.08	**-0.37**	-0.12	-0.06
French legal origins	-0.10	**0.42**	-0.16	0.19	0.28	0.07
German legal origins	0.21	0.00	**0.40**	-0.08	-0.08	-0.21
Tenure of High Court judges	-0.10	-0.24	**-0.37**	0.13	0.03	0.14
Tenure of administrative court judges	-0.11	-0.26	-0.18	0.24	-0.29	0.10
Judicial review	-0.06	0.11	0.19	-0.24	-0.32	**0.44**
Rigidity of constitution	0.08	-0.03	0.21	-0.02	**0.41**	**0.64**
Catholic adherents, %	0.00	**0.41**	-0.20	-0.24	-0.08	0.21
Protestant adherents, %	0.22	-0.21	-0.08	0.29	-0.21	0.20
Muslim adherents, %	-0.25	-0.07	0.09	**0.34**	0.35	-0.23
Buddhist adherents, %	0.15	-0.02	**0.48**	-0.14	0.10	-0.03
Secular values	**0.36**	-0.09	-0.01	-0.16	0.29	-0.14
Protestant ethic	-0.19	-0.10	**0.41**	0.21	-0.21	0.08
Authoritarian; pro-technology	-0.31	0.13	-0.07	**-0.34**	0.16	-0.25

Data Appendix

INSTITUTIONS

Executive Finite Term	Is there a constitutional limit on the number of years the executive can serve before new elections must be called? A zero is recorded if a limit is not explicitly stated and in the cases where the constitution with year limits is suspended or unenforced. *Source: Database of Political Institutions, Beck et al. (2000)*
Legislative Index of Electoral Competitveness	Scale: No Legislature = 1; Unelected legislature = 2; Elected, 1 candidate = 3; 1 party, multiple candidates = 4; multiple parties DID win seats but the largest party received more than 75% of the seats = 6; largest party got less than 75% = 7 *Source: Database of Political Institutions, Beck et al. (2000)*
Executive Index of Electoral Competitveness	Same scale as Legislative Index of Electoral Competitveness, but scores systems where executives who are either elected directly by the population or elected by an electoral college that is elected by the people and has the sole purpose of electing the executive. Executives elected by bodies other than these are given the same score that the electing body would get. Even if the electing body is not the actual "legislature" that is tracked in the Legislative Index of Electoral Competitiveness, the competitiveness of that body is used to score the executive. *Source: Database of Political Institutions, Beck et al. (2000)*
Parliamentary Regime	Parliamentary = 2; Assembly-elected President = 1, Presidential = 0. Systems with unelected executives (those scoring a 2 or 3 on the Executive Index of Political Competitiveness) get a 0. Systems with presidents who are elected directly or by an electoral college (whose only function is to elect the president), in cases where there is no prime minister, also receive a 0. In systems with both a prime minister and a president, the relative power of the parliament and prime minister versus the president determine the categorization of the system. Similar to the dummy variable for presidential government in Persson and Tabellini (1999), Persson and Tabelllini (2003), or Persson and Tabellini (2004), but with broader country coverage. *Source: Database of Political Institutions, Beck et al. (2000)*
Autonomous regions	Are there contiguous autonomous regions? An autonomous region is recorded if a source explicitly mentions a region, area, or district that is autonomous or self-governing. Autonomous regions are required to be contiguous with the country to which they belong, on the presumption that such regions would be more likely to impose a check on central government decision making than would non-contiguous regions. *Source: Database of Political Institutions, Beck et al. (2000)*
District Magnitude	A measure of the average number of lower house representatives elected in each district. District Magnitude ranges between 0 and 1, taking a value of 0 for a system with only single-member districts, and close to 1 for a system with a single electoral district. District Magnitude = 1-(1/MDMH), where MDMH (Mean District Magnitude, House) is the number of seats divided by the number of constituencies. Since the Database of Political Institutions records some countries with MDMH scores of less than 1 (meaning more electoral districts than representatives), these countries are given District Magnitude scores of 0. Similar to the district magnitude variable in Persson and Tabelllini (2003), or Persson and Tabellini (2004), but with broader country coverage. *Source: Database of Political Institutions, Beck et al. (2000)*

Proportional Electoral Rule	Equals 1 if candidates elected based on the percent of votes received by their party and/or if sources specifically call the system "proportional representation". Equals 0 otherwise, unless the Legislative Index of Electoral Competitveness is 4 or less, in which case the observation is left blank. Similar to the dummy variable for majoritarian elections in Persson and Tabellini (1999), Persson and Tabelllini (2003), or Persson and Tabellini (2004), but with broader country coverage.
	Source: Database of Political Institutions, Beck et al. (2000)
State/Province elections	Equals 0 if neither state/province executive or legislature are locally elected. Equals 1 if the executive is appointed but the legislature elected and 2 if both are locally elected. If there are multiple levels of sub-national government, the highest level is considered the state/province level.
	Source: Database of Political Institutions, Beck et al. (2000)
% of representatives elected on a party list	Number of legislators in lower or single chamber that have been appointed through party list voting mechanisms.
	Source: Various sources via Persson and Tabellini (2003) or Persson and Tabellini (2004)
Executive Constraints	Operationally, this variable refers to the extent of institutionalized constraints on the decisionmaking powers of chief executives, whether individuals or collectivities. Such limitations may be imposed by any "accountability groups." In Western democracies these are usually legislatures. Other kinds of accountability groups are the ruling party in a one-party state; the military in coup-prone polities; and in many states a strong, independent judiciary. The concern is therefore with the checks and balances between the various parts of the decision-making process. A seven point scale is used. A score of 1 signals a chief executive with unlimited authority as evidenced by, *inter alia,* frequent constitutional revision or suspension at the executive's initiative, an absence of a legislative assembly, or executive appointment to and removal from any accountability group. A score of 7 signals a chief executive whose authority and power are on par with accountability groups as evidenced by, *inter alia*, a legislature that initiates much or most important legislation or a non-executive-appointed accountability group responsible for choosing the executive.
	Source: Marshall and Jaggers (2000) via Polity IV Project at http://www.cidcm.umd.edu/inscr/polity/
Political Rights	Index of political rights on a scale from 1 to 7. Higher ratings indicate countries that come closer to the ideals suggested by the checklist questions of: (1) free and fair elections; (2) those elected rule; (3) there are competitive parties or other competitive political groupings; (4) the opposition has an important role and power; and (5) the entities have self-determination or an extremely high degree of autonomy.
	Source: Freedom House. 2005. Freedom in the World. New York, NY: Freedom House *via http://www.freedomhouse.org/*
Legal Origin	Identifies the legal origin of the Company Law or Commercial Code of each country. There are five possible origins: British, French, German, Scandinavian, and Socialist.
	Source: various sources Djankov et al. (2003)
Case Law	A dummy variable equal to 1 if judicial decisions are a source of law, 0 otherwise.
	Source: David, Rene. 1973. International Encyclopedia of Comparative Law. New York, NY: Oceana *via La Porta et al. (2004)*
Tenure of High Court judges	This variable measures the tenure of Supreme Court judges (highest court in any country). The variable takes three possible values: tenure is lifelong = 2; tenure is more

than six years but not lifelong = 1; tenure is less than six years = 0.

Source: various sources via La Porta et al. (2004)

Tenure of administrative court judges	This variable measures the tenure of the highest ranked judges ruling on administrative cases. The variable takes three possible values: tenure is lifelong = 2; tenure is more than six years but not lifelong = 1; tenure is less than six years = 0. *Source: various sources via La Porta et al. (2004)*
Judicial Review	This variable measures the extent to which judges (either Supreme Court or constitutional court) have the power to review the constitutionality of laws in a given country. The variable takes three values: full review of constitutionality of laws = 2; limited review of constitutionality of laws = 1; no review of constitutionality of laws = 0. *Source: Maddex (1995) via La Porta et al. (2004)*
Rigidity of consitution	This variable measures, on a scale from 1 to 4, how hard it is to change the constitution in a given country. One point each is given if the approval of the majority of the legislature, the chief of state and a referendum is necessary in order to change the constitution. An additional point is given for each of the following: if a supermajority in the legislature (more than 66% of votes) is needed, if both houses of the legislature have to approve, if the legislature has to approve the amendment in two consecutive legislative terms or if the approval of a majority of state legislature is required. *Source: Maddex (1995) via La Porta et al. (2004)*
Legal formalism index	Measures substantive and procedural statutory intervention in judicial cases at lower-level civil trial courts; ranges from 0 to 7 (7 is a higher level of control). It is formed by adding up scores on seven sub-indices measuring (1) whether case resolution requires the work of professional judges and attorneys, as opposed to other types of adjudicators and lay people; (2) the number of stages carried out mostly in written form over the total number of applicable stages in case resolution; (3) the level of legal justification required in the process; (4) the level of statutory control or intervention in the administration, evaluation, and recording of evidence; (5) the level of control or intervention in the apellate court's review of the first-instance judgment; (6) the formalities required to engage someone in the procedure or to hold her accountable of the judgment; and (7) the number of steps that require the interaction between parties or between them and the court plus every judicial or administrative writ or resolution legally required to advance the proceedings until judgment. *Source: Djankov et al. (2003)*
Catholic, Protestant, Muslim, Buddhist, Eastern adherents, %	Measures the proportion of adherents belonging to a particular faith. Eastern is the sum of Buddhist, Chinese Universist, Confucianist, Hndu, Shintoist, and Taoist adherents. *Source: Barrett, Kurian, and Johnson (2001) via the World Christian Database: http://www.worldchristiandatabase.org/*
Religious Fractionalization	Religious fractionalization is computed as one minus the Herfindahl index of religious faith shares and is the expected probability that two randomly chosen people (within a country) will belong to different religious faiths. *Source: Encyclopedia Britannica via Alesina et al. (2003)*
Trust	Percent of respondents within a country choosing the answer "Most people can be trusted" when asked the question "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?". Data is available from four waves (in 1981, 1990, 1995, and 1999-2001) of the World Values Survey. Country means or percentages from any World Values Survey question are averaged over all waves in which a country-question pair appears.

Order	Percent of respondents within a country choosing the answer "Maintaining order in the nation" when asked the question "If you had to choose, which one of the things on this card would you say is the most important?". The other three choices on the card are "Giving people more say in important government decisions", "Fighting rising prices", and "Protecting freedom of speech". Data is available from four waves (in 1981, 1990, 1995, and 1999-2001) of the World Values Survey. Country means or percentages from any World Values Survey question are averaged over all waves in which a country-question pair appears. *Source: World Values Survey: http://www.worldvaluessurvey.org/*
Voice	Percent of respondents within a country choosing the answer "Giving people more say in important government decisions" when asked the question "If you had to choose, which one of the things on this card would you say is the most important?". The other three choices on the card are "Maintaining order in the nation", "Fighting rising prices", and "Protecting freedom of speech". Data is available from four waves (in 1981, 1990, 1995, and 1999-2001) of the World Values Survey. Country means or percentages from any World Values Survey question are averaged over all waves in which a country-question pair appears. *Source: World Values Survey: http://www.worldvaluessurvey.org/*
Social Protection	Percent of respondents within a country expressing agreement with the statement "The government should take more responsibility to ensure that everyone is provided for" when asked for their views on social insurance. Respondents were told that choosing 1 on a left-to-right, 1-to-10 scale meant completely agreeing with the statement on the left ("The government should take more responsibility...") while choosing 10 meant completely agreeing with the statement on the right ("People should take more responsibility to provide for themselves"). If their views fell in between, they were told, they could choose any number in between 1 and 10 to represent them. We included those respondents who chose 1, 2, or 3 as those agreeing with the statement on the left ("The government should take more responsibility..."). Data is available from four waves (in 1981, 1990, 1995, and 1999-2001) of the World Values Survey. Country means or percentages from any World Values Survey question are averaged over all waves in which a country-question pair appears. *Source: World Values Survey: http://www.worldvaluessurvey.org/*
Anti-corruption	Percent of respondents within a country expressing agreement with the statement "Someone accepting a bribe in the course of their duties is never justifiable" when asked for their views on corruption. Respondents were shown a left-to-right, 1-to-10 scale with "Never Justifiable" at the extreme left of the scale above the number 1 and "Always Justifiable" at the extreme right above the number 10. They were then asked whether they thought "Someone accepting a bribe in the course of their duties" "[could] always be justified, never be justified, or something in between". We included those respondents who chose 1, 2, or 3 as those agreeing with the statement on the left ("Never Justifiable"). Data is available from four waves (in 1981, 1990, 1995, and 1999-2001) of the World Values Survey. Country means or percentages from any World Values Survey question are averaged over all waves in which a country appears. *Source: World Values Survey: http://www.worldvaluessurvey.org/*

Secular values; Protestant ethic; and Authoritarian, pro-technology	The first three principal factors extracted from data on questions #127-130, #196, and #210-211 from the 4th wave (1999-2001) of the World Values Survey. Questions 127-130 ask respondents whether "various changes in our way of life that might take place in the near future" would be a "good thing, a bad thing, or don't you mind?". Question 127 is "Less emphasis on money and material possessions"; 128 is "Less importance placed on work in our lives"; 129 is "More emphasis on the development of technology"; and 130 is "Greater respect for authority". Question 196 asks respondents to use a left-to-right, 1-to-10 scale to indicate the importance of God in their lives; 1 means "Not at all" important, and 10 means "Very" important. Questions 210 and 211 ask respondents whether certain actions can "always be justified, never be justified, or something in between" and instructs them to locate their views on a left-to-right, 1-to-10 scale; 1 means "Never Justifiable", and 10 means "Always Justifiable". Question 210 concerns "Abortion" and 211 "Divorce".
	The Secular values factor picks up covariation in responses to #196, #210 and #211. Higher scores on the Secular values factor indicate countries where respondents feel that God is less important and that abortion and divorce are justifiable.
	The Protestant ethic factor picks up covariation in responses to #127 and #128. Higher scores on the Protestant ethic factor indicate countries where respondents feel that less emphasis on money, material possessions, and work would be a *bad* things.
	The Authoritarian, pro-technology factor picks up covariation in responses to #129 and #130. Higher scores on the Authoritarian, pro-technology factor indicate countries where respondents feel that more emphasis on the development of technology and greater respect for authority would both be *good* things.
	Data is available from four waves (in 1981, 1990, 1995, and 1999-2001) of the World Values Survey. Country means or percentages from any World Values Survey question are averaged over all waves in which a country-question pair appears before factors are extracted.
	Source: World Values Survey: http://www.worldvaluessurvey.org/

INCOME, CONTROLS, and INSTRUMENTS

Real per-capita GDP and real per-capita GDP growth, Summers-Heston	Real GDP per-capita in 2000, expressed in 1996 U.S. dollars. The GDP deflator is chain weighted to reflect the relative importance of different components in GDP in different years. Average yearly growth in real per-capita GDP is calculated for countries with real GDP per-capita data beginning in 1960 at the latest. The end date for average yearly growth calculations is the year 2000. *Source: Heston, Summers, and Aten (2002) via http://pwt.econ.upenn.edu/*
Real per-capita GDP and real per-capita GDP growth, World Bank	Real GDP per-capita in 2002, expressed in 1995 international dollars (purchasing power parity). An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. Average yearly growth in real per-capita GDP is calculated for countries with real GDP per-capita data beginning in 1975 at the latest. The end date for average yearly growth calculations is the year 2002. *Source: World Bank via http://devdata.worldbank.org/dataonline/*
Absolute latitude	The absolute value of the latitude of the capital of the country, scaled to take values between 0 and 1. *Source: CIA Factbook*
Share of GDP value-added in mining, 1988	Value added in the mining industry (including oil and gas) as a proportion of GDP in 1988. *Source: United Nations via Hall and Jones (1999)*

Fraction of primary products in exports, 1970	Ratio of primary products exports to total merchandise exports in 1970, with both numerator and denominator expressed in nominal dollars. Primary products are fuel and the non-fuel primary products in Standard International Trade Classification (revision 1) categories 0 through 4 and 68. *Source: World Bank and various sources via Sachs and Warner (1997)*
Expected malaria, 1994	Expected malaria is produced by taking the fitted values from a regression of the percent of a country's 1994 population at risk of malaria on a "malaria ecology" variable and a climate variable. The percent of a country's 1994 population at risk of malaria is created by overlaying a world map of malaria risk (from the World Health Organization) with a map of world population. The malaria ecology variable is a single index measuring the suitability of a country's environment for reproduction of the malaria vector. It combines temperature, vector abundance, and vector type, and is exogenous to public health interventions and economic conditions. The climate variable measures the share of a country's population living in temperate ecozones, based on the Koeppen-Geiger ecozone classification system. Thus, the fitted values are a measure of the risk of malaria (in the population) due to geographic, climactic, and ecological factors alone and should be exogenous to human intervention. *Source: Gallup and Sachs (2000); Kiszewski et al. (2004); Mellinger, Sachs, and Gallup (2000); and Sachs (2003)*
State History	A measure of the total time current nations have been recognizeable as mature nations. A higher score on the state history variable indicates countries with a greater number of years as self-governing political units in control of most of their presently-defined territory. For each period of 50 years (between AD 1 and 1950) 3 questions are asked and points are allocated as follows: (1) Is there a government above the tribal level? (1point yes, 0 points no); (2) Is this government foreign or locally based? (1 point local, 0.5 points foreign [i.e., the country is a colony], 0.75 if in between [a local government with substantial foreign oversight]); (3) How much of the territory of the modern country was ruled by this government? (1 point if over 50%, 0.75 points if between 25% and 50%, 0.5 points if between 10% and 25%, 0.3 points if less than 10%). The scores are multiplied together in each 50 year period, the data for each of the 39 periods is combined by reducing the weight of periods in the more remote past, and the resulting index is converted to take values between 0 and 1. *Source: Bockstette, Chanda, and Putterman (2002)*
Settler mortality	The estimated mortality rates of European-born soldiers, sailors, and bishops when stationed in European colonies before 1850. *Source: Acemoglu, Johnson, and Robinson (2001)*
Life expectancy, 1965	Life expectancy (at age 0) in 1965. *Source: Various sources via "Barro-Lee Data Set for a Panel of 138 Countries" at http://www.cid.harvard.edu/ciddata/ciddata.html or http://www.nber.org/pub/barro.lee/*
Primary school enrollment, 1965	Total gross enrollment ratio for primary education in 1965. *Source: UNESCO via "Barro-Lee Data Set for a Panel of 138 Countries" at http://www.cid.harvard.edu/ciddata/ciddata.html or http://www.nber.org/pub/barro.lee/*
Capital per worker, 1988	Physical capital per worker in 1988. Physical capital stocks are constructed using the perpetual inventory method. *Source: Hall and Jones (1999)*