CULTURE, INSTITUTIONS AND DEMOCRATIZATION

Yuriy Gorodnichenko
University of California, Berkeley and NBER

Gerard Roland
University of California, Berkeley and CEPR

First draft: November 2012
This draft: September 2013

Abstract: We construct a model of revolution and transition to democracy under an individualist and a collectivist culture. We show that countries having a more individualistic culture, despite potentially being less able to overcome collective action problems, are more likely to end up adopting democracy faster than countries with collectivist culture. Empirically, we show that there is a strong causal effect from individualistic culture to average polity scores, controlling for other determinants of democracy emphasized in the literature.

1. Introduction

Understanding the underlying determinants of democratization has always been one of the key questions in social sciences. In recent decades, various theories, based or not on formal models, have been proposed to explain the underlying causes of democratization. A very large literature has also developed analyzing empirically the determinants of democratization. To our knowledge, the role of culture has generally been absent in this literature. The question of the role of culture in democratization is, however, of great importance in the twenty first century. Recent decades have seen great progress in democracy across the world. Are we likely to see worldwide convergence towards democracy? A big question related to China. Will China evolve towards democracy? What role does culture play in facilitating or not evolutions towards democracy?

In this paper, we present a very simple formal model of democratization that includes individualist and collectivist culture. A collectivist culture may potentially have it easier than an individualist culture to overcome collective action problems. However, in the former, there is assumed to be a stronger pressure towards conformity and a stronger aversion for radical institutional innovation. We show that, starting from an initial situation of autocracy, a collectivist society will end up less often adopting a democratic regime than an individualist society. This will be due to the stronger pressure for conformity in a collectivist culture and the possibly stronger ability to overcome collective action problems will not be relevant for this outcome. A collectivist society will also end up more often having a "good" autocracy, i.e. an autocracy that does not act in a predatory way towards

its citizens. Good autocracies will tend not to be overthrown by collectivist societies, unlike in individualist societies.

We test the main prediction of the model on existing data. We find a strong and robust causal effect of individualism on average polity scores between 1980 and 2010. We use alternatively or together two instrumental variables. A first instrumental variable is a measure of genetic distance between countries based on differences in frequencies of blood types within countries. This instrument is used as a proxy for vertical cultural transmission from parents to children. A second instrumental variable is a measure of historical pathogen prevalence. This variable has been argued to have a direct effect on the choice of collectivist culture as stronger pathogen prevalence created better survival prospects for communities that adopted more collectivist values putting stronger limits on individual behavior, showing less openness towards foreigners and putting strong emphasis on tradition and stability of social norms.

Since Lipset's (1959) seminal work, a large literature, both theoretical and empirical, has been devoted to understanding the determinants of democratization. Lipset emphasized the role of economic development in his seminal article and it is no surprise that most debates on democratization turned around the question of whether or not economic development is a fundamental determinant of democracy. Lipset himself was taking a broad view of economic and social modernization creating conditions for a greater demand for democracy. In recent years, debates about the importance of economic development have been revived with the work by Przeworski et al. (2000). Using data between 1950

and 1990 for 135 countries, they showed that the correlation between income and democracy was not so much explained by economic development leading to democratization rather than by the fact that once countries have achieved a certain level of economic development, they usually never revert to authoritarian regimes. Countries opt for democratic or dictatorial regimes for reasons that are exogenous to economic development but if richer countries develop stable democracies, then the data will show a strong correlation between income per capita and economic development.[1] Acemoglu and Robinson (2006) argued that democratization was mostly an elite strategy to commit to redistributive transfers in response to revolutionary threats.[2] Acemoglu et al. (2005), (2008) showed that the relationship between income, or education, and democracy, is mostly a feature of cross-sectional data and that when performing panel data analysis, one ceases to find a significant relationship between these variables and democracy.[3]

Boix and Stokes (2003) found that by taking data far enough in the past (to the second half of the nineteenth century), one can establish a significant relation between income per capita and democracy. Treisman (2012) also finds an effect of economic development in the medium to long run, with democratic transitions happening more often after the exit of a dictator.

---

[1] Persson and Tabellini (2009) built a model and showed empirical support for a theory of a positive feedback between the capital of democratic experience and economic development. Persson (2005) showed that the form of democracy mattered for income development: the introduction of parliamentary democracy with proportional electoral rule produced the most growth-promoting policies.

[2] Ciccone and Bruckner (2009) found that transitory negative income shocks related to negative rainfall shocks have a positive effect on democratization in Sub-Saharan Africa.

[3] Grosjean and Senik (2011) found no link between income and support for democracy in the context of transition countries.

To find mention of cultural determinants of democracy, one has to go back to Almond and Verba (1963) who emphasized the importance of civic culture as a prerequisite for democracy in a comparative study of five countries (Italy, Germany, the US, the UK and Mexico). More recently, Inglehart and Weizel (2005), using the World Values Survey, argued that modernization leads to changes in values towards more self-expression and stronger emphasis on individual liberty. According to them, these changes in values are behind the stronger support for democracy. Their study is the closest to ours as the values they emphasize coincide very much with individualism as we understand it. However, they do not show a causal effect of culture on democracy. Moreover, they emphasize the cultural change brought about by modernization. Our approach is different as we take culture as more slow-moving (see Roland, 2004)[4]. In Gorodnichenko and Roland (2010, 2011), we showed that there is a causal effect from individualism to economic development. Our approach means that culture affects both economic development and the choice of political regime. By the same token, however, it is difficult to disentangle the direct effect of individualism on democracy from its indirect effect, working through income per capita. We are however able to show that there is a significant direct effect of individualism on democracy, even though we cannot give a precise measure of this direct effect.

[4] There is now a large empirical literature showing that culture has a very strong inertia, from research showing the long run effects of cultural differences between groups of early settlers in the US (see Fischer, 1989 or Grosjean, 2011) to research showing the persistence of culture of ancestors'country of origin among US immigrants (see e.g. Guiso et al., 2006, Tabellini, 2008, Algan and Cahuc, 2010).

Our instrumental variable strategy to show a causal effect of individualism on democracy relies in part of the analysis on genetic data, as a proxy for cultural transmission across generations. More recently, some scholars have claimed that there is a direct link between genes and political behavior such as political participation and ideology (Fowler *et al.* , 2008, Hatemi and Mc Dermott, 2012). These studies focus however on individual political behavior and individual political psychology, not on how average genetic endowments affect a collectivity or a country's culture. This difference is very important. The individual approach postulates a direct approach between an individual's genetic endowment and that individual's psychology or political behavior. The approach between genes and culture taken here is very different. The idea is that the average endowment of certain types of genes may affect the culture of a collectivity, not directly through their individual behavior but indirectly through the adjustment of norms, values and beliefs to that average endowment. In that spirit, a link has been found for example between the frequency of certain genes, such as variants of genes putting people more at risk for depression when exposed to life stressors (Chiao and Blizinsky, 2009) or variants of genes causing greater stress in case of social rejection (Way and Lierbermann, 2010), and collectivist culture, but this research was done on smaller country samples than the ones we use in this article (See Gorodnichenko and Roland, 2010 for the use of those variables as good instrumental variables for culture).

Section two presents the model, section three the cross-sectional analysis and section four some panel data analysis. Section five concludes.

2. The model

The model embeds cultural differences in an Acemoglu-Robinson (2000) type of model of democratization and revolution. Take a polity composed of two classes of infinitely lived citizens: rich and poor. The size of the population is normalized to one. The rich are present in proportion $\delta < ½$. The average income of the rich is $y^r = \theta y/\delta$ whereas the average income of the poor, present in proportion $1-\delta > ½$, is $y^p = (1-\theta)y/(1-\delta)$ where y is average income and $\theta (\geq 1/2)$ is an indicator of income inequality.

The initial situation is one of autocracy. We will make the distinction between good and bad autocrats. We assume that a bad autocrat acts in a predatory way and takes away all income from the citizens. Therefore, after-tax income of the rich and poor is assumed to be equal to zero. We assume that a good autocrat does not tax or redistribute. Everybody, rich and poor, prefers good autocrats to bad autocrats. A good autocrat is there with probability α and bad autocrat with probability $(1-\alpha)$. We assume that a ruler stays in power forever unless there is a successful revolt to overthrow the ruler.

In each period, citizens' ability to overcome their collective action problem and be able to successfully overthrow the ruler occurs with probability q_k ($k=I$ for individualism or C for collectivism). We do not need for the results below to make any particular assumptions about the ranking of q_k between different cultures but a natural assumption would be $q_C > q_I$. The justification would be that collectivist culture can help overcome free rider problems.

In periods when citizens are able to overcome their collective action problems, called revolutionary situations, citizens may choose or not to overthrow the regime. While it seems obvious that citizens will want to overthrow a bad autocrat, it is not a priori obvious that they want to replace a good autocrat.

Since the poor are the majority, the decision to engage or not in collective action is theirs. Even if the rich would not want to engage in collective action, we assume that the decision of the poor is the one that matters. If they engage in collective action, they will either replace the old autocrat with a new, possibly good, autocrat or introduce a radical institutional innovation and replace autocracy with democracy. In case of successful collective action, it is assumed that an autocrat will be replaced by another autocrat (possibly a good one, which happens with probability α) with probability $\sigma_{k.}$, and that he will be replaced by democracy with probability (1- σ_k). We assume that $\sigma_c > \sigma_l$ and this assumption will matter for our results. A justification for this assumption is that collectivist culture has a higher level of conformism and a lower propensity to experiment with institutional innovations. Another, probably deeper, justification is that collectivist values put a heavier emphasis on the difference between a benevolent ruler and a bad ruler, on political stability and the capacity of a good ruler to wisely arbitrate between different clans and groups while individualist values put a heavier emphasis on

individual freedom, on equality of citizens before the law and on limited government.[5]

Note that in this model, the decision is to engage in collective action and there is uncertainty about what institutional regime will obtain after the decision to revolt. A good case in point is that of the Arab spring of 2011 where it is absolutely not clear whether democratic regimes will emerge or instead new autocratic regimes with changed rules. The above assumption means that the uncertainty over the outcome of collective action is influenced by deep cultural parameters.

The main cultural differences in the model (differences in q_k and σ_k) are undoubtedly in very reduced form and quite of a "black box" nature. We do not yet have satisfactory theories of how collective action problems are overcome, and even less of the dynamics of collective action. These limitations are those of our current knowledge and of existing models of democratization and revolution. Nevertheless, the current model makes some limited progress in our knowledge of institutional change by introducing a cultural component to theories of revolution and democratization.

It is assumed that once democracy has been introduced, it remains forever. We thus rule out by assumption coups by the rich. Under democracy, the poor are the majority and tax the rich. They are better off under democracy than under even a good autocratic ruler whereas the rich prefer the latter since there is no

[5] See Gorodnichenko and Roland (2012) for a fuller discussion of the cross-cultural differences between individualism and collectivism and their implications for economic and institutional behavior.

redistribution under a good autocrat. The value function for individual of income class *i* under democracy is:

$$V_D^i = \frac{y^i + \tau^P (y - y^i) - C(\tau) y}{1 - \beta}$$

where $\tau^P = \arg\max \quad y^P + \tau(y - y^P) - C(\tau) y$ and *C(τ)y* is the distortionary cost from redistributive taxation.

Under a predatory ruler, the poor will always prefer to revolt. However, under a good autocrat, the decision to revolt may lead to democracy with a certain probability, which makes the poor better off, but it may also lead to the arrival of a predatory ruler.

Under a predatory ruler, the value function for the poor (we skip the subscripts as we concentrate only on the decisions and payoffs of the poor) is:

$$V_B = 0 + \beta\left[q_k \sigma_k \left[\alpha V_G + (1-\alpha) V_B\right] + q_k (1 - \sigma_k) V_D + (1 - q_k) V_B\right]$$

where *B* stands for the predatory, bad ruler and *G* for the good ruler. Note that V_G will depend on whether the poor decide or not to revolt against a good autocrat. The value function for the poor under a good autocrat if they decide not to revolt (N) is:

$$V_{GN} = \frac{y^p}{1 - \beta}$$

whereas if they decide to revolt (R), it is:

$$V_{GR} = y^p + \beta\left[q_k\sigma_k\left[\alpha V_{GR} + (1-\alpha)V_B\right] + q_k(1-\sigma_k)V_D + (1-q_k)V_{GR}\right]$$

Note that the expression for V_{GR} is similar to that of V_B. Indeed, we have that

$$V_{GR} - V_B = y^p + \beta(1-q_k)(V_{GR} - V_B) = \frac{y^p}{1-\beta(1-q_k)}$$

We can then derive the following proposition:

Proposition 1: There exits a threshold level $\bar{\sigma}_k$ <1 , above which there will be no revolutionary action and below which there will always be revolutionary action under a good ruler,.

Proof of proposition 1: See the appendix.

Proposition 1 says that under a very collectivist culture (high σ_k), there will never be a revolt against a good autocrat whereas under a very individualist culture (low σ_k), there will always be one. This result is interesting because even if collectivist cultures were better able than collectivist cultures to overcome their collective action problem, this higher ability would be trumped by the higher degree of conformism (high σ_k).

The comparative statics is also interesting. By doing the appropriate calculations, one can see that when σ_k is sufficiently high (close to 1) a higher q_k will lead to a stronger preference not to revolt, whereas when σ_k is sufficiently low (close to 0), a higher q_k will lead to a stronger expected payoff from revolting! The latter result is intuitive but the former is surprising and counterintuitive. It means that, a higher ability to overcome the collective action problem leads to prefer not

to revolt when the degree of conformity is high. The intuition can be easily explained given the model. There is a trade-off involved in the decision to revolt. With some probability the revolt will lead to democracy, which will enhance welfare for the poor, but with some probability, it will lead to the choice of a worse autocrat. When q_k is high (and σ_k is high), the latter becomes a more probable event.

Another comparative static result of the model is that low income inequality (low θ) reduces the advantage of democracy over a good autocracy, a result that was already present in Acemoglu and Robinson (2006). In a fully egalitarian society with a good autocrat, there is indeed no advantage to adopting democracy.

We can draw several other implications from this very basic initial analysis.

First, if collectivist societies have a higher q_k, they will revolt with a higher probability when faced with a bad autocrat. This is because there will always be a revolt against a bad autocrat but collectivist cultures will better be able to overcome their collective action problem against a bad autocrat. In his famous *History of Goverment from the Earliest Times (1997)*, Samuel Finer stated that there were many more peasant revolts in ancient China than in Europe in the pre-industrial world (p.523, p. 799). While we do not have good empirical data to test this statement, it is nevertheless interesting and worth further examination. A second implication is that having a good autocrat in a collectivist society will lead to higher regime stability because of the absence of revolt.

The main result we would like to test, and also the most interesting one, follows from proposition 1. Since more collectivist societies characterized by a high σ_k will

tend not to revolt when they have a good autocrat while more individualist societies characterized by a low σ_k will tend to decide to engage in revolt even though they have a worse ability to overcome their collective action problem, individualistic societies are more likely to end up adopting democracy, even when q_k is very low, than collectivist societies with a high enough σ_k. This is the object of proposition 2:

Proposition 2: Societies with a σ_k lower than $\bar{\sigma}_k$ have a higher probability of ending up with democracy than societies with a higher σ_k, above $\bar{\sigma}_k$.

Proof of proposition 2: See the appendix

The reason for this result is simple. Under a good autocrat, there will be no revolt under a collectivist culture, in contrast to what is the case in an individualistic culture. However low is q_k, individualistic cultures are more likely to end up with a democracy. Under a bad autocrat, collectivist cultures are more likely to be successful in their revolt than individualistic cultures. However, they will tend more often to replace a bad autocrat with another autocrat rather than with democracy. If they get a good autocrat, they will not revolt any more and if they get a bad autocrat they will revolt but more likely to put another autocrat in place.

3. Cross-country analysis.

We now turn to the empirical analysis of the link between culture and democratization. Because the data we have on culture, and in particular on

individualism and collectivism, are cross-country data, most of our empirical analysis will be devoted to cross-country analysis.

As dependent variable to measure democratization, we take the Polity IV index averaged between 1980-2010. Polity scores take values between -10 and +10. Negative scores are for autocracies and the more negative the score the more autocratic the regime. Positive scores are for democracies and a score of +10 goes to fully institutionalized democracies. Note that many countries have a score of +10. Taking an average over 30 years is useful because many countries switched from autocracy to democracy during that period and the average score will reflect the time since democracy was established as well as the quality of democracy. This period will cover many democratization episodes that took place during the so-called third wave of democratization (Huntington, 1991) but it does not cover recent waves such as the Arab Spring. Polity Data go back much further in time but since we want to establish a causal effect from culture to political institutions, it makes little sense to go further back in time since our cultural data were generated starting from the 1970s.

As measure of individualism and collectivism, we use the country level data developed by Hofstede (2001) who initially used surveys of IBM employees in about 30 countries. To avoid cultural biases in the way questions were framed, the survey was translated into local languages by a team of English and local language speakers. With new waves of surveys and replication studies, Hofstede's measure of individualism has been expanded to almost 80 countries.[6] The individualism score

[6] The most current version of the data is available at http://www.geert-hofstede.com/.

measures the extent to which it is believed that individuals are supposed to take care of themselves as opposed to being strongly integrated and loyal to a cohesive group. Individuals in countries with a high level of the individualism index value personal freedom and status, while individuals in countries with a low level of the index value harmony and conformity. Hofstede's index, as well as the measures of individualism from other studies, uses a broad array of survey questions to establish cultural values. Factor analysis is used to summarize data and construct indices. In Hofstede's analysis, the index of individualism is the first factor in work goal questions about the value of personal time, freedom, interesting and fulfilling work, etc. This component loads positively on valuing individual freedom, opportunity, achievement, advancement, recognition and negatively on valuing harmony, cooperation, relations with superiors. Although Hofstede's data were initially collected mostly with the purpose of understanding differences in IBM's corporate culture, the main advantage of Hofstede's measure of individualism is that it has been validated in a large number of studies. The ranking of countries across various studies and measures (see Hofstede (2001) for a review) is very stable. Hofstede's measure has been used extensively in the cross-cultural psychology literature, which views the individualism-collectivism cleavage as the main cultural cleavage across countries (see Heine, 2008). The Hofstede data also correlate quite well with the more recent data by Schwartz (1994, 2006). Schwartz's cultural dimensions of intellectual and affective autonomy correlate positively with individualism while the dimension of embeddedness correlates negatively with individualism. These cultural dimensions are also interpreted in a

very similar way as Hofstede's individualism-collectivism index. Intuitively, it also seems that the individualism-collectivism cleavage is the most important cultural difference when it comes to differences in values about political regimes.

The causality between individualism and democracy can go both ways. One can argue, as we do in this paper, that individualist culture has a positive causal effect on democracy, but one can also make an argument in the other direction: the more people live under democracy and are accustomed to the protection of the rights of individual citizens, the more they espouse an individualist world view with its values of freedom and opportunity, equality of citizens before the law and constraints on the executive (see for example Persson and Tabellini, 2009). Therefore, any convincing empirical analysis of a causal effect of individualist culture on democracy must rely on a good instrumental variable.

Our main instrumental variable is based on epidemiological data put together by Fincher et al. (2008) for 73 countries on historical pathogen prevalence.[7] Given a strong correlation between pathogen prevalence and collectivism, Fincher et al. argue that stronger pathogen prevalence pushed communities to adopt more collectivist values emphasizing tradition, putting stronger limits on individual behavior, and showing less openness towards foreigners. Collectivism is thus understood as a defense mechanism created to cope with greater pathogen prevalence. Historical pathogen prevalence can thus be seen to have a quite direct causal effect on the individualism-collectivism cleavage. It can also be argued to satisfy the exclusion restriction since historical

[7] Fincher et al. (2008) use 9 pathogens: leishmanias, trypanosomes, malaria, schistosomes, filariae, leprosy, dengue, typhus and tuberculosis.

pathogen prevalence is not likely to have a direct effect on political regime choice. Indeed, one cannot claim that autocracy is more efficient than democracy, or vice-versa, in dealing with pathogen prevalence. Autocracy suffers from lack of transparency as was seen in China a few years back with the SARS epidemic and is not necessarily more efficient in dealing with a humanitarian disaster, as was the case with the catastrophic handling of the 2008 massive flooding from cyclone Nargis in Myanmar. Democracy may or may not lack speed in response to a major health epidemic. Everything depends on the efficiency of government administration. If anything, one could argue that a higher pathogen prevalence should be correlated with a more centralized form of government given the externalities from disease transmission. However, centralization of government is orthogonal to the type of political regime.

In some specifications we also use another instrumental variable in conjunction with historical pathogen prevalence: the Euclidian distance between the frequency of blood types A and B in a given country and the frequency of those blood types in the USA, which is the most individualistic country in our sample. This is a measure of genetic distance. To the extent that culture is transmitted mainly from parents to children (See Bisin and Verdier, 200, 2001), so are genes. Thus, genetic markers can be used as a proxy for cultural markers and this instrumental variable should be seen as a proxy measure of cultural transmission. To be clear, this particular identification strategy *does not* postulate that the first stage captures a direct causal effect between genes (here blood types) and culture. Instead, this strategy exploits the *correlation* between cultural and genetic

transmission from patents to offspring. Note that blood types are neutral genetic markers that do not in any way affect human behavior. They are thus not likely to have any effect on political regime choices.

The genetic data originate from Cavalli-Sforza et al. (1994) which provides measured genetic markers for roughly 2,000 groups of population across the globe. These data contain allele frequencies (alleles are variants taken by a gene) for various ethnic groups. Using the frequency of blood types is attractive because, apart from being neutral genetic markers, the frequency of alleles determining blood types is the most widely available genetic information and thus we can construct the most comprehensive (in terms of country coverage) measure of genetic distance. Since the genetic data are available at the level of ethnic groups while our analysis is done at the country level, we have aggregated genetic information using ethnic shares of population from Fearon (2003).[8] Specifically, if we define blood frequency f_{bec} for blood type b and ethnic group e in country c, then the country level blood frequency for type b is calculated as $\bar{f}_{bc} = \sum_e s_{ec} f_{bec}$ where s_{ec} is the share of ethnic group e in the population of country c.

The disadvantage of blood type distance instrumental variable is that it could be an instrument for other cultural variables, which may also be argued to affect political regime choice. It may also reflect migrations of last centuries, and thus not only the culture of migrants, but also their institutions and human capital. It is thus not a priori clear that blood distance satisfies the exclusion restriction. Having two

[8] Whenever Fearon's (2003) data were too crude, we used additional sources of information. For example, Fearon (2003) reports on the share of whites in the USA. We used a variety of sources about migration patterns and information on ancestors to split whites into British, German, Italian, Polish, etc. Details are available upon request.

plausible instruments is nevertheless an advantage in empirical analysis because one can use formal tests of the exclusion restriction.

The first three columns of Table 1 give the basic OLS and IV regressions. The effect of individualism is strongly significant with OLS and with IV, whether we take only historical pathogen prevalence as an instrument, or together with blood distance. Note that in the two IV regressions, the first stage is very significant, indicating no problem of weak instrument. Moreover, the p value of 0.849 for the overidentifying restriction test confirms that one cannot reject the null of the instrumental variables being correctly excluded at any standard significance level. Note that the IV coefficients are somewhat higher than the OLS coefficient, indicating measurement error. If we take the IV coefficient in column 3 as a baseline indicator, it means that a one standard deviation increase in individualism (say from Iran to Poland, or Argentina to Norway) should lead to a 4 point increase in the average polity score.

In columns 4 to 6, we perform the same regressions but include controls for conflict. Countries plagued by conflict may indeed be more likely to have democracy suspended or eliminated during periods of conflict. We thus include four variables from the International Country Risk Guide, averaged between 1985 and 2009. These measure low perceptions of risk for 1) cross-border conflict, 2) civil disorder, 3) ethnic tensions and 4) war. The only robust variable is the low risk of ethnic tension, which has a positive effect on the polity score. Here also, the IV first stages are strong and the p value for the overidentifying restriction is far

away from significance levels. Note that the inclusion of controls for conflict tends to increase the size of the coefficient for individualism.

INSERT TABLE 1

In Table 2, we perform regressions including controls for religion. One may think that the effect of our cultural variable might go away once we control for religion. In columns 1 to 3, we control for the share of Muslim population in countries, data taken from Fearon (2003) and in columns 4 to 6, we introduce broader controls covering adherents to all major religions, data taken from Barro and McCleary (2003). They include the proportion of Protestants, Catholics, Orthodox Christians, adherents of other Christian religions, Jews, Muslims, Hindus, Bhuddists and other Eastern religions. Fish (2002) for example found a negative correlation between democracy and Islam. We see from Table 2 that individualism remains significant once we introduce these controls. Also, the first stage regressions for the IV estimations are strong and, as can be seen in columns (3) and (6), the null for the two IVs being correctly excluded cannot be rejected. The share of Muslim population has a significantly negative coefficient. In further tables, we will report only results with both instrumental variables being used. When introducing shares of other religions (results not shown), the share of Muslims remains strongly negatively significant and is the only strongly robust variable. Note that the proportion of Jews is positively associated to democracy in all regressions. Given that Jews are a minority in all countries except in Israel, the most natural interpretation is that Jews who have always been persecuted in the past have migrated to the more stable democratic countries in the world. Note that

when introducing controls for religion, the size of the coefficient for individualism becomes smaller. This may be interpreted in two ways. The most immediate interpretation is that the effect of individualism is smaller once one takes religion into account but another plausible interpretation could be that religion is endogenous to the political regime, in which case the coefficient on individualism can be biased downwards.

INSERT TABLE 2

In Table 3, we introduce the most important control that has been considered in the literature: income. As discussed in the introduction, since Lipset (1959), discussions on the determinants of democracy have turned around measures of economic development. We use the log of income (at purchasing power parity) per worker in 2000 from the Penn World Tables as a control for the level of economic development. From an econometric point of view, this is problematic from several points of view. First of all, in our own work (Gorodnichenko and Roland, 2010, 2011), we have shown that there is a causal effect of individualism on income per capita. There is thus likely to be a collinearity problem when using both as regressors. Second, there might also be an endogeneity problem as democracy may affect the level of economic development. We must therefore be very cautious when interpreting the results of such regressions. In columns 1 and 2 (OLS without and with controls for conflict and religion), we see that both individualism and log income per worker are statistically significant. In column 3, we use as regressors individualism and average protection against expropriation rights, the variable used by Acemoglu et

al. (2001) to measure institutions. Acemoglu et al. (2008) claim that income has no effect on democracy, the underlying idea being that institutions (the rule of law) affect both democracy and successful economic development. In none of the specifications where we included institutions, be it separately in column (3), jointly with income per worker (OLS in column (4) and IV in column (7)) do we obtain a statistically significant estimate. Log income per worker is generally only robustly significant in the OLS regressions, but not in the IV regressions. This is probably because of the multi-collinearity problems mentioned above. Despite the econometric problems mentioned, individualism remains significant in all the specifications in Table 3. In column 8, we instrument both for individualism and for income per worker. Since in our previous work, we found a significant causal effect of individualism on log income per worker, we need to use an instrumental variable for log income per worker that is unrelated to culture. We use geographical variables (distance from the equator and from the U.K. and a dummy for being landlocked) that have been claimed to affect economic development. These geographical variables are arguably not correlated with democracy and they are not correlated with individualism either. From an econometric point of view, this is the cleanest solution we could think of to the problems mentioned above. Obviously, one would lose statistical power in proceeding this way. Looking at column (8), we see that individualism is still significant, albeit now at the 10% level while log income per worker is not. Overall, since we need to be cautious in interpreting the results of this table because of the econometric problems mentioned, the main robust conclusion we can draw from the results of Table 3 is

that individualism is still statistically significant, even when including log income per worker and institutions as regressors.

INSERT TABLE 3

In Table 4, we add an important variable that is related to our model: inequality. The Gini coefficient is significant in all regressions, OLS and IV, except when we add controls for conflict and religion. The sign of the coefficient is in line with the theory as a higher level of inequality is associated with a higher average polity score. There is, however, an obvious endogeneity problem here as there is in reality probably a two-way relation between inequality and democracy. To our knowledge, the literature has not so far found a causal effect from inequality to democracy.

In Table 5, we introduce controls for other variables that have been associated in the literature with democracy: education, measures of fractionalization and economic openness. Education has been argued to be an important factor behind democratization. Bourguignon and Verdier (2000) for example built a model where education is both an engine of growth and of political participation. Column (1) includes the education index from the *Human Development Report*. We see that individualism and education are both statistically significant. In column (2), we introduce measures of ethnic, cultural and ethno-linguistic fractionalization. None comes out as significant while individualism remains strongly significant. A similar result obtains in column (4) when we control for openness. The IV regressions in columns (5) –(8) give similar results, except that now education loses significance.

We conclude this section by stating that individualism has a significant and robust causal effect on the polity score, even after including controls that have been used in the literature, such as conflict, religion, income, institutions, education, fractionalization and openness.

4. Panel data analysis

A drawback of cross-sectional analysis of democratization is that it does not exploit the times series variation of the data and the within country variation across time. Fortunately, it is possible to perform panel data analysis of the polity score to understand the dynamics of democratization within a country. However, a problem is that our cultural data on individualism and collectivism is only available in cross-sectional form, as is the case for most other cultural variables. Inserting culture in a panel regression will in that case act in a similar way to fixed effects. What we can however do is check if, when interacting individualism with another times series variable that can effect democratization, such as income or education, we find significant effects. It is this strategy that we adopted in Table 6. In columns (1) and (2), we first report regressions of the polity score on log income per worker, without and with the lagged dependent variable. We see that log income per worker has a significant positive effect on democratization in a panel setup. In Tables (3) and (4), we redo the same specifications as in columns (1) and (2) but include individualism. In both specifications, log income per worker remains significant but individualism is only significant when we leave out the lagged variable of polity. Note however that it is borderline significant to the 10% level. In

columns (5) and (6), we introduce the interaction between the log of income per worker and individualism. The interaction variable is significant, whether or not we introduce the lagged polity score. Columns (7) to (10) perform a similar analysis for primary education instead of income per worker. When primary education is included as a regressor, individualism is not significant. When individualism is interacted with primary education, we see no robust effect. The interaction variable is significant without the lagged polity score but loses significance once we introduce it. Note that we have much less observations in the education regressions than in the income regressions.

Overall, the panel data analysis gives more mixed results on the effects of individualism on democratization. These less conclusive results are to a certain extent related to the nature of the variables we analyze. Indeed, culture is slow-moving and it would be surprising to see important effects of culture on the basis of annual time variation. Furthermore, given that cultural attributes are likely to be measured with error, panel regressions based on annual data can exacerbate attenuation biases (see Griliches and Hausman 1986). To address this problem, we report in Table 7 results based on "long-differences regressions" where the dependent variable is the difference in the polity index between 1960 and 2000 and regressors are the log difference of income per capita and the difference in level of primary education during that same period as well as individualism and the polity score in 1960. This approach enhances the signal-to-noise ratio for the variables and thus one may obtain a crisper view of how variables are related. With long differences, individualism remains significant, except in columns (3) and (5)

when we introduce education and income differences as regressors, but this is mostly due to outliers. The coefficient on individualism is significant when we use Huber robust regressions.

5. Conclusions.

We have presented a model integrating culture in democratization processes. Assuming that a collectivist culture may make it easier to overcome collective action problems but displays a stronger taste for conformity and a stronger aversion to institutional innovation, the model predicts that, starting from autocracy as the initial regime, an individualistic culture will have a higher likelihood of switching to democracy than a collectivist culture. The reason is that a collectivist culture will tend to stay stuck with a "good" non predatory autocracy, which will not be the case with an individualistic culture.

We then performed empirical analysis of the effects of individualism on average polity scores. In a cross-sectional setting, the effects are strong, robust and causal, using genetic distance between blood group types as one instrument and historical pathogen prevalence as other instrument. In a panel setting, the effects of individualism are less strong and robust, except when we consider time variation over a longer horizon than annual data. This is consistent with the fact that culture is slow-moving and that its effects operate at a low frequency level.

Our theoretical and empirical results have important implications. They imply in particular that as countries with collectivist cultures develop economically, they will not necessarily evolve towards democracy or might do so

more slowly or possibly only under the effect of an exceptional crisis. Countries like China, Vietnam or Singapore, which have experienced considerable economic success in recent decades have not adopted Western-style democracies. Similarly, countries that have experienced a genuine democratization process like Taiwan, Thailand, Indonesia and Korea have done so relatively recently and their average Polity score over the last 30 years have not been better than Guatemala, Panama or Peru. Note that countries in the Middle East have in general higher individualism scores than many Asian countries. In the long run, if our analysis is correct, they could end up becoming more democratic, despite the higher authoritarian streak observed in the past in Islamic countries.

REFERENCES

Acemoglu, D., S. Johnson, and J. Robinson (2001) "The Colonial Origins of Comparative Development: An Empirical Investigation," *American Economic Review* 91: 1369-1401.

Acemoglu, D., Johnson, S., Robinson, J. A., Yared, P. (2005) "From Education to Democracy?" *American Economic Review. Papers and Proceedings.* 95(2), pp. 44-49.

Acemoglu, D., Johnson, S., Robinson, J. A., Yared, P., (2008). Income and democracy. *American Economic Review* 98, 808-42.

Acemoglu, D. and J. Robinson (2000). "Why Did the West Extend the Franchise? Democracy, Inequality and Growth in Historical Perspective" *Quarterly Journal of Economics* 115(4), pp. 1167-1199.

Acemoglu D. and J. Robinson (2006). *Economic Origins of Dictatorship and Democracy* Cambridge University Press.

Algan, Y. and P. Cahuc (2010). "Inherited Trust and Growth" *American Economic Review* 100 (5), 2060-2092.

Almond, G. and S. Verba (1963) . The Civic Culture. Political Attitude and Democracy in Five Nations. Sage Publications New York.

Barro, R., and J.W. Lee (2012) "A New Data Set of Educational Attainment in the World, 1950–2010", mimeo Harvard University.

Barro, R.J., and R.M. McCleary (2003) "Religion and Economic Growth Across Countries," *American Sociological Review* 68(5), 760-781.

Bisin, A. and T. Verdier (2000) ""Beyond The Melting Pot": Cultural Transmission, Marriage, And The Evolution Of Ethnic And Religious Traits," *Quarterly Journal of Economics* 115, 955-988.

Bisin, A. and T. Verdier (2001) "The Economics of Cultural Transmission and the Dynamics of Preferences,"*Journal of Economic Theory* 97, 298-319.

Boix, C. and S. Stokes (2003). "Endogenous Democratization" *World Politics*, 55(4), pp. 517-549.

Bourguignon and Verdier "Oligarchy, Democracy, Inequality and Growth" *Journal of Development Economics* 62(2), 285-313.

Cavalli-Sforza, L. L., P. Menozzi, and A. Piazza (1994). *The History and Geography of Human Genes.* Princeton University Press.

Ciccone, A. and M. Bruckner (2009) " Rain and the Democratic Window of Opportunity" mimeo University of Pompeu Fabra.

Fearon, J.(2003) "Ethnic and Cultural Diversity by Country," *Journal of Economic Growth* 8(2), 195-222.

Fincher, C.L., R. Thornhill, D.R. Murray, and M. Schaller (2008) "Pathogen prevalence predicts human cross-cultural variability in individualism/collectivism" *Proceedings - Royal Society. Biological sciences* 275(1640), 1279-1285.

Finer, S. (1997). *The History of Government*, volumes I-III, Oxford University Press, Oxford.

Fischer, D. H. (1989). *Albion's seed: Four British folkways in America.* New York: Oxford University Press.

Fish, S. (2002) "Islam and Authoritarianism" *World Politics* 55(1)4-37.

Fowler, J., L. Baker and C. Dawes (2008) Genetic Variation in Political Participation. *American Political Science Review* 102, 233-248

Gorodnichenko, Y. and G. Roland (2010). "Culture, Institutions and the Wealth of Nations", CEPR Discussion Paper No 8013.

Gorodnichenko, Y. and G. Roland (2011) "Which Dimensions of Culture Matter for Long-Run Growth?" *American Economic Review Papers and Proceedings* 101(3): 492-498.

Gorodnichenko, Y. and G. Roland (2012) "Understanding the Individualism-Collectivism Cleavage and its Effects: Lessons from Cultural Psychology." In Aoki, M. T. Kuran and G. Roland (ed.) *Institutions and Comparative Economic Development*, Palgrave McMillan (forthcoming).

Griliches, Zvi, and & Jerry A. Hausman, 1986. "Errors in variables in panel data," *Journal of Econometrics* 31(1), 93-118.

Grosjean, P. (2011), "A history of violence: the culture of honor as a determinant of homicide in the US South" mimeo University of San Francisco.

Grosjean, P. and C. Senik (2011) " Democracy, Market Liberalization and Political Preferences" *Review of Economics and Statistics* , 93(1), 365-381.

Guiso, L., P. Sapienza and L. Zingales. (2006) "Does Culture Affect Economic Outcomes." *Journal of Economic Perspectives* 20(2), pp.: 23-48.

Hatemi, and R. McDermott (2012) "The Genetics of Politics: Discovery, Challenges and Progress" Trends in Genetics, August .

Heine, Steve J. (2008) *Cultural psychology*. W. W. Norton & Company.

Huntington, S. (1991). *The Third Wave: Democratization in the Late Twentieth Century* University of Oklahoma Press.

Inglehart, R. and C. Weizel (2005). *Modernization, Cultural Change and Democracy: The Human Development Sequence*, Cambridge University Press, Cambridge UK.

Lipset, Seymour Martin (1959). "Some Social Requisites of Democracy: Economic Development and Political Legitimacy," *American Political Science Review, 53, 69-105.*

Persson, T. (2005) " Forms of Democracy, Policy and Economic Development" NBER Working Paper No 11171.

Persson, T. and G. Tabellini (2009) "Democratic Capital: The Nexus of Political and Economic Change" *American Economic Journal*: *Macroeconomics 1*, 88-126.

Przeworski, A. and F. Limongi (1997). "Modernization: Theories and Facts." World Politics 49:155-183.

Schwartz, S. H. (1994) "Beyond Individualism/Collectivism: New Cultural Dimensions of Values" in Uichol K. et al, eds., *Individualism and Collectivism: Theory, Method, and Applications*. Sage.

Schwartz, S. H. (2006) "A Theory of Cultural Value Orientations: Explication and Applications," Comparative Sociology 5(2-3), 137-182.

Tabellini, G. (2008) "Institutions and Culture" *Journal of the European Economic Association* 6(2-3), pp. 255-294.

Treisman, D. (2012). "Income, Democracy and the Cunning of Reason", mimeo UCLA.

APPENDIX

Proof of Proposition 1:

Under a good ruler, the poor prefer not to revolt if:

$$V_{GN} = \frac{y^p}{1-\beta} \geq V_{GR} = y^p + \beta\left[q_k\sigma_k\left[\alpha V_{GR} + (1-\alpha)V_B\right] + q_k(1-\sigma_k)V_D + (1-q_k)V_{GR}\right]$$

Using the expression for $V_{GR} - V_B = y^p + \beta(1-q_k)(V_{GR} - V_B) = \frac{y^p}{1-\beta(1-q_k)}$

we get

$$V_{GN} \geq V_{GR} \Leftrightarrow$$
$$\frac{y^p}{1-\beta} \geq y^p + \beta[q_k\sigma_k\alpha\frac{y^p}{1-\beta(1-q_k)} + q_k\sigma_k\left(V_{GR} - \frac{y^p}{1-\beta(1-q_k)}\right) +$$
$$q_k(1-\sigma_k)V_D + (1-q_k)V_{GR}]$$
$$\Leftrightarrow \frac{y^p}{1-\beta} \geq y^p + \beta[q_k(1-\sigma_k)V_D - (1-\alpha)q_k\sigma_k\frac{y^p}{1-\beta(1-q_k)} +$$
$$+(1-q_k(1-\sigma_k))V_{GR}]$$

Since the right hand side of the inequality is equal to $V_{GR,}$ we have that

$$V_{GN} \geq V_{GR} \Leftrightarrow$$
$$\frac{y^p}{1-\beta} \geq \frac{1}{1-\beta(1-q_k(1-\sigma_k))}[y^p + \beta[q_k(1-\sigma_k)V_D - (1-\alpha)q_k\sigma_k\frac{y^p}{1-\beta(1-q_k)}]]$$

A quick look at this last inequality shows several things. First, a high degree of conformity (a high σ_k) implies the preference not to revolt. With σ_k -> 1,

$$V_{GR} \to \frac{1}{1-\beta}[y^p + -\beta(1-\alpha)q_k\frac{y^p}{1-\beta(1-q_k)}] < \frac{y^p}{1-\beta}$$

Note now that when σ_k is low and tends towards zero, there will be a strict preference to revolt. Indeed, in that case:

$$V_{GR} \rightarrow \frac{1}{1-\beta(1-q_k)}[y^p + \beta q_k V_D] \geq V_{GN} \Leftrightarrow$$
$$\frac{1}{1-\beta(1-q_k)}[y^p + \beta q_k V_D] \geq \frac{y^p}{1-\beta} \Leftrightarrow$$
$$V_D \geq V_{GN}$$

The latter inequality is always satisfied as democracy brings positive redistribution to the poor. Since $V_{GN} > V_{GR}$ for high values of σ_k and $V_{GN} < V_{GR}$ for low values of σ_k and since V_{GR} can be shown to decrease with σ_k, by continuity, there exists a threshold value $\bar{\sigma}_k$ at which the poor are indifferent between revolting and not revolting. Above $\bar{\sigma}_k$, they prefer not to revolt against a good autocrat, and below $\bar{\sigma}_k$ they prefer to revolt against a good autocrat.

QED.

Proof of Proposition 2:

Under a collectivist culture with a high enough σ_k above $\bar{\sigma}_k$ such that the poor decide not to revolt, the probability of ending up with a democratic regime after t periods can be shown to be equal to

$$(1-\alpha)\beta q_k(1-\sigma_k)\sum_{i=0}^{t}(\beta q_k \sigma_k)^i(1-\alpha)^i$$

When t -> ∝, the probability of having democracy converges to $\frac{(1-\alpha)\beta q_k(1-\sigma_k)}{1-(1-\alpha)\beta q_k \sigma_k}$.

Note that this expression tends towards zero as σ_k *->1*.

Under an individualist culture with a low enough σ_k such that the poor decide to revolt against any type of dictator, the probability of ending up with a democratic regime after t periods can be shown to be equal to

$$\beta q_k (1-\sigma_k) \sum_{i=0}^{t} (\beta q_k \sigma_k)^i$$

With t -> ∝, the probability of having democracy converges to $\frac{\beta q_k (1-\sigma_k)}{1-\beta q_k \sigma_k}$ which is strictly positive as long as $q_k > 0$.

QED

TABLE 1: Individualism and democratization. Basic OLS and IV regressions with and without controls for conflict.

	(1) OLS	(2) IV:	(3) IV: blood distance + pathogens	(4) OLS	(5) IV	(6) IV: blood distance + pathogens
individualism	0.117***	0.167***	0.170***	0.142***	0.250***	0.230***
	(0.019)	(0.027)	(0.024)	(0.027)	(0.063)	(0.046)
Low risk of:				-1.145	-1.317	-1.270
- Cross-border conflict						
				(1.592)	(1.685)	(1.663)
- Civil disorder				-1.800	-4.148**	-3.729**
				(1.161)	(1.847)	(1.455)
- Ethnic tensions				1.208**	1.127**	1.138**
				(0.508)	(0.565)	(0.545)
- War				2.771	3.813*	3.604*
				(2.090)	(2.077)	(2.081)
Observations	75	74	74	75	74	74
R^2	0.205	0.155	0.150	0.283	0.161	0.197
1st stage F-stat		125.8	76.18		35.82	33.99
1st stage Partial R^2		0.527	0.644		0.313	0.492
Overid test p-value			0.849			0.5855

Notes: The dependent variable is the average polity score for the 1980-2010 period from the Polity IV data base. *Individualism* is Hofstede's index of individualism. A larger value of the index corresponds to a greater level of individualism. The four conflict variables (*low risk of: cross-border conflict, civil disorder, ethnic tensions and war*) are taken from the International Country Risk Guide and are averaged between 1985 and 2009. A higher score means a lower risk of the variable. Instrumental variables: *historical pathogens* is the Historical Pathogen prevalence index from Fincher et al. (2008); *blood distance* is the Euclidian distance of frequency of blood types A and B in a given country relative to their frequency in the USA,. *Over-id test p-value* reports the p-value for the overidentifying restriction tests that instruments are correctly excluded. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 2: Individualism and Democratization. OLS and IV regressions with controls for religion.

	Controls for major religions					
	(1) OLS	(2) IV	(3) IV: blood distance + pathogens	(4) OLS	(5) IV	(6) IV: blood distance + pathogens
individualism	0.074***	0.093***	0.095***	0.049***	0.081**	0.071***
	(0.017)	(0.028)	(0.028)	(0.017)	(0.035)	(0.024)
Share of Muslim population	-10.877***	-10.548***	-10.512***			
	(1.641)	(1.770)	(1.758)			
Religious adherence controls	No	No	No	Yes	Yes	Yes
Observations	75	74	74	75	74	74
R^2	0.609	0.597	0.595	0.721	0.710	0.715
1st stage F-stat		98.70	56.33		36.49	70.85
1st stage Partial R^2		0.497	0.625		0.332	0.603
Overid test p-value			0.852			0.701

Notes: The dependent variable is the average polity score for the 1980-2010 period from the Polity IV data base. *Individualism* is Hofstede's index of individualism. A larger value of the index corresponds to a greater level of individualism. *Share of Muslim populatio*n: taken from Fearon (2003)**.** Religious adherence variables are from Barro and McCleary (2003). They include the proportion of Protestants, Catholics, Orthodox Christians, adherents of other Christian religions, Jews, Muslims, Hindus, Bhuddists and other Eastern religions. Instrumental variables:, historical pathogens is the Historical Pathogen prevalence index from Fincher et al. (2008); *blood distance* is the Euclidian distance of frequency of blood types A and B in a given country relative to the frequency of blood types A and B in the USA. *Over-id test p-value* reports the p-value for the overidentifying restriction tests that instruments are correctly excluded.Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Individualism and Democratization. Controls for income and institutions.

	(1) OLS: income	(2) OLS: income and controls	(3) OLS: institutions	(4) OLS: income and institutions	(5) IV: income	(6) IV: income and controls	(7) IV: income + institutions	(8) IV: also income
individualism	0.066**	0.071***	0.096***	0.066**	0.139***	0.117***	0.133***	0.175*
	(0.032)	(0.023)	(0.026)	(0.032)	(0.051)	(0.043)	(0.049)	(0.101)
Log income per worker	1.948**	1.915***		2.532**	0.891	1.724***	1.583	-0.363
	(0.876)	(0.648)		(1.093)	(1.087)	(0.584)	(1.289)	(2.445)
Protection against expropriation risk			0.205	-0.147			-0.155	
			(0.165)	(0.249)			(0.252)	
controls	N	Y	N	N	N	Y	N	N
Observations	74	74	75	74	73	73	73	73
R^2	0.276	0.684	0.228	0.281	0.212	0.666	0.226	0.135
1st stage F-stat					35.80	21.22	37.96	22.54
1st stage Partial R^2					0.447	0.394	0.467	0.537
Overid test p-value					0.563	0.94	0.806	0.1134

Notes: The dependent variable is the average polity score for the 1980-2010 period from the Polity IV data base. *Individualism* is Hofstede's index of individualism. A larger value of the index corresponds to a greater level of individualism. *Log income per worker*: log income (at purchasing power parity) per worker in 2000 from the Penn World Tables. *Protection against expropriation risk* (ICRG, average 1985 -2009). Controls include share of Muslim population and *low risk of: cross-border conflict, civil disorder, ethnic tensions and war* (ICRG, average 1985 - 2009). Instrumental variables: *blood distance* and *historical pathogens*. In column 8, individualism is instrumented by historical pathogens and Log income per worker is instrumented by geographical variables (distance from the equator, longitude, dummy for landlocked). *Over-id test p-value* reports the p-value for the overidentifying restriction tests that instruments are correctly excluded. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Individualism and Democratization with controls for income, inequality and institutions.

	OLS			IV		
	inequality	income, institutions, and inequality	income, institutions, inequality and controls	inequality	income, institutions, and inequality	income, institutions, inequality and controls
	(1)	(2)	(3)	(4)	(5)	(6)
individualism	0.133***	0.062*	0.063**	0.184***	0.094*	0.100**
	(0.025)	(0.032)	(0.027)	(0.037)	(0.051)	(0.045)
Log income per worker		3.448***	2.654**		3.037***	2.241**
		(0.922)	(1.074)		(1.098)	(1.099)
Protection against expropriation risk		0.022	0.012		0.038	0.049
		(0.224)	(0.209)		(0.222)	(0.209)
Gini coefficient	0.133***	0.175**	0.070	0.141*	0.196**	0.084
	(0.025)	(0.081)	(0.065)	(0.072)	(0.083)	(0.065)
Controls	N	N	Y	N	N	Y
Observations	72	71	71	72	71	71
R^2	0.259	0.504	0.670	0.222	0.494	0.658

Notes: The dependent variable is the average polity score for the 1980-2010 period from the Polity IV data base. *Individualism* is Hofstede's index of individualism. A larger value of the index corresponds to a greater level of individualism. *Log income per worker*: log income (at purchasing power parity) per worker in 2000 from the Penn World Tables. *Protection against expropriation risk* (ICRG, average 1985 -2009). Controls include share of Muslim population and *low risk of: cross-border conflict, civil disorder, ethnic tensions and war* (ICRG, average 1985 - 2009). Instrumental variables: *blood distance* and *historical pathogens*. In column 8, individualism is instrumented by historical pathogens and Log income per worker is instrumented by geographical variables (distance from the equator, dummy for landlocked). *Over-id test p-value* reports the p-value for the overidentifying restriction tests that instruments are correctly excluded. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 5: Individualism and Democratization. Controls for fractionalization, education and openness.

	(1) OLS: education	(2) OLS: fractionalization measures	(3) OLS: openness	(4) IV: education	(5) IV: fractionalization measures	(6) IV: openness
individualism	0.083***	0.088***	0.102***	0.131***	0.147***	0.166***
	(0.023)	(0.030)	(0.026)	(0.047)	(0.045)	(0.051)
Ethnical fractionalization		1.454			2.736	
		(3.530)			(3.327)	
Cultural frationalization		-7.062			-6.215	
		(4.624)			(4.399)	
Ethno-linguistic fractionalization		-0.036			-0.754	
		(2.882)			(2.842)	
Education index	8.386*			6.776		
	(4.770)			(4.933)		
Openness			0.003			0.010
			(0.010)			(0.011)
Observations	74	67	75	73	66	74
R^2	0.654	0.623	0.636	0.632	0.585	0.596
1st stage F-stat				28.45	28.53	24.45
1st stage Partial R^2				0.406	0.529	0.441
Overid test p-value				0.685	0.23	0.745

Notes: The dependent variable is the average polity score for the 1980-2010 period from the Polity IV data base. *Individualism* is Hofstede's index of individualism. A larger value of the index corresponds to a greater level of individualism. *Ethnical. Cultural and ethno-linguistical fractionalization* are from Fearon (2003). *Education index*: World Bank Human Development Report Education Index (average 1980-2005). Openness: Openness ratio in current prices (Penn World Tables 2000). All regressions control for the share of Muslim Population and risk of conflict variables. Instrumental variables: *blood distance* and *historical pathogens*. *Over-id test p-value* reports the p-value for the overidentifying restriction tests that instruments are correctly excluded. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 6. Democratization, individualism , income and education. Panel regressions (ordinary least squares).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Controlling for income per worker					Controlling for primary education			
$Polity_{t-1}$		0.971***		0.964***		0.924***		0.964***		0.953***
		(0.003)		(0.005)		(0.007)		(0.010)		(0.016)
Log income per worker	2.227***	0.114***	2.631***	0.145***						
	(0.163)	(0.021)	(0.179)	(0.035)						
Individualism			0.089***	0.002			0.039	-0.001		
			(0.027)	(0.001)			(0.028)	(0.003)		
Individualism interacted with log income per worker					0.040***	0.005***				
					(0.004)	(0.002)				
Primary education							2.043***	0.123**		
							(0.280)	(0.052)		
Individualism interacted with primary education									0.049***	0.003
									(0.009)	(0.003)
Observations	5,674	5,510	3,309	3,224	3,309	3,224	518	511	518	511
R^2	0.033				0.027	0.849			0.058	0.891

Notes: The dependent variable is the annual Polity index (1950-2204). *$Polity_{t-1}$* is the Polity index lagged one year. *Log income per worker* is from the Penn World Tables. *Individualism* is Hofstede's index of individualism. A larger value of the index corresponds to a greater level of individualism. *Primary education* is from the Barro-Lee data base on education. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 7. Long-differences regression

Dependent variable: $Polity_{2000} - Polity1960$	OLS	Huber robust regression	OLS	Huber robust regression	OLS	Huber robust regression
	(1)	(2)	(3)	(4)	(5)	(6)
Individualism	0.040*	0.030***	0.036	0.027***	0.032	0.018**
	(0.022)	(0.006)	(0.022)	(0.006)	(0.024)	(0.007)
$\log\left(\frac{Y_{2000}}{Y_{1960}}\right)$			-1.673	0.672**	-0.904	0.769**
			(1.254)	(0.287)	(1.081)	(0.287)
$Education_{2000} - Education_{1960}$					-0.752	-0.448**
					(1.017)	(0.199)
$Polity_{1960}$	-0.682***	-0.988***	-0.729***	-0.968***	-0.894***	-0.984***
	(0.109)	(0.019)	(0.118)	(0.023)	(0.112)	(0.023)
Observations	60	60	51	51	45	45
R-squared	0.518	0.982	0.617	0.981	0.801	0.983

Notes: Huber robust regression automatically identifies and downweighs influential observations/outliers. Y is income per worker. $Education$ is "primary education".