Education and the Transition to Sustained Democracy

Crespo Cuaresma, Jesus; Oberdabernig, Doris Anita

DOI:
10.57938/219749f0-3654-432c-9e23-3ca72d156cd1

Published: 01/03/2014

Document Version:
Publisher's PDF, also known as Version of record

Document License:
Unspecified

Department of Economics
Working Paper No. 170

Education and the Transition to Sustained Democracy

Jesus Crespo Cuaresma
Doris A. Oberdabernig

March 2014

Education and the Transition to Sustained Democracy*

Jesús Crespo Cuaresma†

WU, IIASA, WIC and *WIFO*

Doris A. Oberdabernig‡

WU and *WIFO*

Abstract

We study empirically the role of education, age structure and other socioeconomic factors as a determinant of the transition to stable democratic regimes. Our findings suggest that educational improvements (in particular in primary education) and policies towards reducing inequalities in educational attainment play a particularly important role as a catalyst of sustainable democratization processes.

JEL classification: I20, J10, O11, P26

Keywords: Democracy, Education, Age Structure, Economic Development.

*The authors would like to thank Wilfried Altzinger, Octavio Fernández-Amador, Anne Goujon, Stefan Humer, Samir K.C., Elke Loichinger, Wolfgang Lutz, Elias Papaioannou, Warren Sanderson, participants at the International Institute for Applied Systems Analysis (IIASA) Young Scientists Summer Program, as well as participants at the Econometrics Working Group at the University of Innsbruck (Austria), the 6th European Workshop on Labour Markets and Demographic Change (Austria), and the Annual Meeting of the Austrian Economics Association (NOeG, Austria).

†Department of Economics, Vienna University of Economics and Business (WU); World Population Program, International Institute of Applied Systems Analysis (IIASA); Wittgenstein Centre for Demography and Global Human Capital (WIC); and Austrian Institute for Economic Research (WIFO). WU, Welthandelplatz 1, 1020 Vienna (Austria), jcrespo@wu.ac.at.

‡Department of Economics, Vienna University of Economics and Business (WU); and Austrian Institute for Economic Research (WIFO). A major part of this work was written while Doris A. Oberdabernig participated in the IIASA Young Scientists Summer Program. WU, Welthandelplatz 1, 1020 Vienna (Austria), doberdab@wu.ac.at.

I Introduction

Political scientists and economists have shown great interest in unveiling the determinants of the transition from autocratic to democratic regimes. In particular, the role played by education as a catalyst of democratization processes has been the focus of many studies, both of theoretical and empirical nature. Many authors argue that education introduces a "culture of democracy" by rising the benefits of civic participation such as voting an organizing and promoting interest in politics and political activities. The results of this body of research suggest that, at the aggregate level, both the changes in overall educational attainment and the degree of equality in the distribution of education among members of a society contribute to explaining transitions to democracy.

Using a global sample of countries covering information for 125 economies, Helliwell (1994) finds that secondary education is a significant predictor of democracy. The results in Barro (1999) support that higher primary school attainment rates as well as a smaller gender gap in educational attainment tend to be related to more democratic political regimes. Although these results have been challenged by Acemoglu et al. (2005), who fail to find a statistically significant effect of education in explaining democratic transitions, Bobba and Coviello (2007) argue that this result is driven by weak identification and weak instruments problems in the econometric strategy used. In addition, Bobba and Coviello (2007) show that education systematically predicts democracy in the sample used by Acemoglu et al. (2005) once the adequate dynamic panel data estimation method is used. These empirical results find further support in the analysis carried out by Lutz et al. (2009), who focus on the interaction between demographic developments and education expansions and find that, in addition to improvements in educational attainment, declines in fertility rates also tend to predict democratization processes.

Casteló-Climent (2008) explores the role that the distributional dimension of education plays as a determinant of democracy. The empirical results in Casteló-Climent (2008) confirm that in addition to average years of schooling, changes in how the educational attainment of the population is distributed among individuals is an important factor explaining transitions to democracy. The findings of Papaioannou and Siourounis (2008b) point in the same direction,

showing that high levels of educational attainment are not only linked to a higher probability of a country undertaking a democratic transition, but also to the speed of the transition and the intensity of the political reforms carried out.

While most authors aim at isolating the causal link running from education to democracy, there is plenty of evidence that political regimes have an effect on educational attainment. Stasavage (2005), for example, finds a positive relationship between multi party electoral competition and spending in primary education. Barro (1998, 1999), Glaeser et al. (2004) and Glaeser et al. (2007) identify causality by comparing political regime outcomes with past education realizations. In this sense, the statistical linkages are identified as causal in the sense of Granger-causality.[1] Some authors address the question of causality between education and democracy making use of natural experiments. Milligan et al. (2004) exploit exogenous changes in compulsory schooling laws to identify the role of education as a determinant of the likelihood of becoming politically involved and find sizeable effects for the US. Dee (2004) finds that voter turnout is increased after improvements in educational attainment caused by (exogenous) changes in the availability of junior and community colleges. Casteló-Climent (2008) and Papaioannou and Siourounis (2008b) account for reverse causation by restricting their respective samples to countries that were dictatorships at the beginning of the period under investigation.

In this paper we contribute to the literature in several aspects. On the one hand, we complement the existing literature by concentrating exclusively on stable political regimes and thus studying the factors that lead to long-lasting spells of democracy, which we refer to as *sustained democracy* periods. Most of the existing studies that investigate the driving factors of democratic transitions tend to neglect this issue and concentrate on the short-run dynamics of measures of political rights or civil liberties.[2] On the other hand, we explore the interaction of changes in educational attainment and in age structure as a determinant of sustained democratization processes. Our results emphasize the privileged role played by education and its distribution among individuals as a predictor of sustained political

[1] Acemoglu et al. (2005) point out that the results of Glaeser et al. (2004, 2007) are not robust to changes in the model specification and find that the omission of initial income *per capita* in a regression of regime type as the dependent variable results in an insignificant education coefficient in some cases. Including time fixed effects, the effect of the education variable also becomes statistically insignificant.

[2] Papaioannou and Siourounis (2008b) are an exception and control for regime stability by putting the restriction on their democracy indicator to stay in the new regime category for at least five years and change this threshold to up to seven years. We focus on a longer time horizon of 15 years in the main analysis presented here.

change. In particular, we find that steps towards reducing inequality in education across age groups and between males and females tend to be linked to a higher probability of sustained democratization.

The paper is structured as follows. Section 2 describes the data used, as well as the method employed to define sustained democracy periods. Section 3 presents the empirical results based on binary dependent models and performs checks aimed at ensuring that the results are robust. Section 4 concludes.

II Measuring Sustained Democracy

Several available datasets provide measures for political rights and civil liberties which can be used to build democracy indicators. The Polity IV Project database on Political Regime Characteristics and Transitions by Marshall et al. (2011), data on political rights and civil liberties provided by Gastil (various years), which is compiled and updated in the Freedom in the World database by Freedom House, the ACLP Political and Economic Database by Alvarez et al. (1999), the democracy database by Vanhanen (2000) and a database by Papaioannou and Siourounis (2008a), just to name a few. A detailed overview of the reliability of data on democracy is provided by Papaioannou and Siourounis (2008a,b) and for data on the quality of institutions by Glaeser et al. (2004). In all of the three papers the authors stress that the Polity IV political regime index is the most comprehensive one when compared to other indicators.[3] The same applies to the data on institutional quality.[4]

The quantitative assessment of the determinants of democratization processes is frequently plagued with potential reverse causation problems, which may lead to biased estimates and misleading inference. In the spirit of other studies which circumvent this problem by imposing restrictions to the democracy variable,[5] we create an indicator of *sustained political regimes*, which identifies (relatively long) periods where the political regime of a given country remained stable. The Polity IV democracy index (variable *polity2* in the dataset) ranges

[3]Papaioannou and Siourounis compare the Polity IV dataset to the Freedom House political rights and civil liberties indicators and the Alvarez et al. (1996) and Przeworski et al. (2000) regime classification, as well as to an update of this dataset by Golder (2005).

[4]Glaeser et al. (2004) compare Polity IV data with survey indicators of institutional quality from the International Country Risk Guide and an index of government effectiveness collected by Kaufmann et al. (2003).

[5]See, for example, Casteló-Climent (2008) and Papaioannou and Siourounis (2008b) who account for reverse causation by looking at countries that were dictatorships at the beginning of the period considered.

from -10 (strong autocracy) to +10 (strong democracies). The construction of our index relies on measures of competitiveness of executive recruitment, openness of executive recruitment, constraints on chief executive, regulation of participation and competitiveness of participation. We start by classifying country-year observations as *autocracies* for a polity score of -10 to -4 and as *democracies* for a polity score of +4 to +10. A country is said to experience a *sustained democracy (autocracy) period* if the democracy index does not move beyond the threshold defining democratic (autocratic) regimes within a period of 15 years. Our analysis is based on the collapsed cross sectional dataset composed by episodes of sustained autocratic regimes and sustained democratic regimes in the period 1960-2011. To rule out possible remaining endogeneity bias arising from the fact that a change in political rights of a country could affect a change in our variables of interest, all possible explanatory variables are evaluated at the beginning of the corresponding episode in the empirical analysis carried out.[6] Applying this definition, we are only able to include in our sample countries that were not classified as democracies at the beginning of the sample in 1960. We have only a small number of autocracy observations in our sample if we proceed in the same way as for democracies, since the starting date of sustained autocratic episodes tends to be earlier in our sample. Evaluating the explanatory variables at the starting date leads thus to a big loss of autocracy observations as our data for explanatory variables does not cover the years before 1960. Therefore, we evaluate each potential explanatory variable at its mean for the corresponding time window in the case of sustained autocratic episodes.

The dataset constructed is composed by 100 observations of sustained political regime episodes corresponding to 84 countries, which are presented in Table 1. Benin, Bulgaria, Hungary, Madagascar, Malawi, Mali, Mexico, Mongolia, Mozambique, Nicaragua, Panama, Paraguay, Poland, Portugal, Romania, and Spain are included in both the autocratic and democratic sample at different points in time.

[6] A similar technique is used by Kraay and Nehru (2006) in the framework of debt crises in order to identify debt distress episodes.

Table 1: Sustained political regime episodes in the sample

	Country	Year*		Country	Year*
1	Albania $^{(a)}$	1969.5	43	Kazakhstan $^{(a)}$	1998
2	Algeria $^{(a)}$	1970	44	Kenya $^{(a)}$	1977.5
3	Azerbaijan $^{(a)}$	1998	45	Korea, Rep. $^{(d)}$	1988
4	Bahrain $^{(a)}$	1987	46	Lao People's Dem.Rep $^{(a)}$	1988
5	Bangladesh $^{(d)}$	1991	47	Lesotho $^{(a)}$	1976
6	Belarus $^{(a)}$	1998.5	48	Liberia $^{(a)}$	1972.5
7	Benin $^{(a)}$	1975.5 $^{(a)}$, 1991 $^{(d)}$	49	Madagascar $^{(a)}$	1977.5 $^{(a)}$, 1992 $^{(d)}$
8	Bhutan $^{(a)}$	1977	50	Malawi $^{(a)}$	1973.5 $^{(a)}$, 1994 $^{(d)}$
9	Bolivia $^{(d)}$	1982	51	Mali $^{(a)}$	1970 $^{(a)}$, 1992 $^{(d)}$
10	Brazil $^{(d)}$	1985	52	Mauritania $^{(a)}$	1977.5
11	Bulgaria $^{(a)}$	1969.5 $^{(a)}$, 1990 $^{(d)}$	53	Mexico $^{(a)}$	1963 $^{(a)}$, 1994 $^{(d)}$
12	Burkina Faso $^{(a)}$	1984.5	54	Mongolia $^{(a)}$	1969.5 $^{(a)}$, 1992 $^{(d)}$
13	Burundi $^{(a)}$	1973.5	55	Morocco $^{(a)}$	1983
14	Cameroon $^{(a)}$	1980.5	56	Mozambique $^{(a)}$	1979 $^{(a)}$, 1994 $^{(d)}$
15	Cape Verde $^{(d)}$	1991	57	Nepal $^{(a)}$	1965
16	Central African Republic $^{(a)}$	1971	58	Nicaragua $^{(a)}$	1965 $^{(a)}$, 1990 $^{(d)}$
17	Chad $^{(a)}$	1963.5	59	Niger $^{(a)}$	1970
18	Chile $^{(d)}$	1989	60	Panama $^{(a)}$	1973 $^{(a)}$, 1989 $^{(d)}$
19	China,P.R.: Mainland $^{(a)}$	1980.5	61	Paraguay $^{(a)}$	1969 $^{(a)}$, 1992 $^{(d)}$
20	Congo, Dem. Rep. of $^{(a)}$	1978	62	Philippines $^{(d)}$	1987
21	Congo, Republic of $^{(a)}$	1971.5	63	Poland $^{(a)}$	1969 $^{(a)}$, 1989 $^{(d)}$
22	Cuba $^{(a)}$	1981	64	Portugal $^{(a)}$	1961.5 $^{(a)}$, 1976 $^{(d)}$
23	Côte d'Ivoire $^{(a)}$	1974	65	Qatar $^{(a)}$	1986
24	Djibouti $^{(a)}$	1982.5	66	Romania $^{(a)}$	1969 $^{(a)}$, 1990 $^{(d)}$
25	Egypt $^{(a)}$	1977	67	Rwasnda $^{(a)}$	1976.5
26	El Salvador $^{(d)}$	1984	68	Saudi Arabia $^{(a)}$	1980.5
27	Equatorial Guinea $^{(a)}$	1985	69	Senegal $^{(a)}$	1965
28	Eritrea $^{(a)}$	1997	70	Sierra Leone $^{(a)}$	1978
29	Ethiopia $^{(a)}$	1970.33	71	Somalia $^{(a)}$	1979.5
30	Gabon $^{(a)}$	1978.71	72	Spain $^{(a)}$	1962 $^{(a)}$, 1978 $^{(d)}$
31	Gambia, The $^{(a)}$	1997.5	73	Sudan $^{(a)}$	1994
32	Guatemala $^{(d)}$	1996	74	Suriname $^{(d)}$	1991
33	Guinea $^{(a)}$	1972	75	Swasziland $^{(a)}$	1987
34	Guinea-Bissau $^{(a)}$	1978.5	76	Syrian Arab Republic $^{(a)}$	1982
35	Guyana $^{(d)}$	1992	77	Tanzania $^{(a)}$	1972.5
36	Haiti $^{(a)}$	1969.5	78	Togo $^{(a)}$	1970.5
37	Honduras $^{(d)}$	1982	79	Tunisia $^{(a)}$	1968
38	Hungary $^{(a)}$	1968.5 $^{(a)}$, 1990 $^{(d)}$	80	Turkmenistan $^{(a)}$	1996
39	Indonesia $^{(a)}$	1974	81	Uruguay $^{(d)}$	1985
40	Iran, Islamic Republic of $^{(a)}$	1972.13	82	Uzbekistan $^{(a)}$	1996
41	Iraq $^{(a)}$	1979.5	83	Vietnam $^{(a)}$	1988.5
42	Jordan $^{(a)}$	1969	84	Zambia $^{(a)}$	1976

(a) refers to episodes corresponding to autocratic regimes.
(d) refers to episodes corresponding to democratic regimes.
∗For democracies year indicates the year at which explanatory variables are evaluated (initial year).
∗For autocracies year indicates the mean year for the time window over which explanatory variables are averaged.

III Education and the Transition to Sustained Democracy: The Empirical Evidence

1 The Econometric Setting

Using the sustained political regime classification, we assess the role played by human capital and other factors as determinants of democratization using standard probit models. The specification is thus given by

$$P(y_i = 1|X_i) = F(x_i\beta|X) \tag{1}$$

where y_i takes value one if that episode is a sustained democratic period and zero if it is a sustained autocratic period, X is a matrix of explanatory variables with rows given by x_i, β is the corresponding column vector of parameters and $F(z)$ is the the cumulative normal distribution function.

In addition to educational attainment, which is the central interest of our analysis, the literature on the determinants of political change proposes several categories of variables that should theoretically be able to account for democratization processes and thus can be included in the set of explanatory variables in equation (1). Differences in the demographic structure of countries have often been put forward as a determinant of differences in political outcomes. A high proportion of young individuals has been often found to have a destabilizing effect on political regimes (Cincotta, 2008), a phenomenon that is often referred to as the *youth bulge*. To the extent that the age structure of a society is determined by fertility and mortality patterns, econometric models aiming at identifying the forces driving durable democratization processes should account for differences in demographic determinants in their specifications (see Lutz et al., 2009, for example).

The importance of income and wealth as prerequisites for democracy is already pointed out by Lipset (1959). Barro (1999) emphasizes that economic development has to precede democratization for the resulting regime to be stable. Acemoglu et al. (2009), however, show that the result of previous empirical studies that found *per capita* income a significant predictor of democratization was driven by omitted variable bias. López-Córdova and Meissner (2005) provide evidence that trade openness positively influences the likelihood of democratization through its positive effect on economic growth. Related arguments can be

put forward to hypothesize that income inequality is an additional factor affecting democratization. Acemoglu and Robinson (2000) argue that inequality induces democratization due to higher social unrest. Bourguignon and Verdier (2000), on the contrary, suggest that inequality in income has adverse effects on democratization.

Beyond differences in income and wealth, other dimensions of heterogeneity have been claimed to affect the likelihood of sustainable democratization episodes. Ethnolinguistic fractionalization as a measure for heterogeneity of the population has been often included in econometric models of democratization, leading in general to conclude that high levels of fractionalization translate into a lower probability of transition to democracy (see Barro, 1999; Przeworski et al., 2000; Glaeser et al., 2004; Casteló-Climent, 2008, for some examples). Cultural and religious factors are also usually highlighted as potential determinants of democratization and tend to be included in regression models either as binary variables which identify cultural characteristics or as covariates measuring the share of population with different religious affiliations (see Huntington, 1992; Lipset, 1994; Barro, 1999; Casteló-Climent, 2008, among others). Urbanization rates are also found to be positively related to democratization, partly due to preceding industrialization (see Casteló-Climent, 2008, as an example).

Some authors argue that the colonial history of a country has a significant effect on democratic transitions due to the institutional legacy inherited from the Western settlers (see Barro, 1999; Lipset, 1994; Acemoglu et al., 2001). In the empirical literature, countries which are natural resource abundant have been found to face a lower probability of a transition to sustained democracy. Barro (1999), for example, argues that the pressure for democratization is higher for income generated from the accumulation of human and physical capital than for income associated with natural resources.[7]

In our analysis, control variables based on the theoretical linkages proposed above are considered as potential determinants of the likelihood of a sustained democracy spell.

[7]In addition, Crespo Cuaresma et al. (2011) find that, after controlling for other determinants, dictatorships tend to have a larger duration in oil-abundant countries.

2 Education and Sustained Democracy

We start by estimating a simple specification where the explanatory variables are the share of the working age population (ages 15-64) with primary education and the proportion of the working age population with higher education (completed junior secondary education or higher), sourced from the IIASA dataset (Lutz et al., 2007),[8] and the natural logarithm of GDP *per capita*, sourced from the World Bank's World Development Indicators Dataset. These explanatory variables are used as the set of fixed covariates in all probit regressions of the analysis. The inclusion of educational variables corresponding to different levels of attainment informs us of their potentially different effect on democratization processes, while the income variable accounts for other factors related to economic development beyond education.

The first column in Table 2 displays the results of the probit regression which includes these variables. The effect of the education variables is significantly positive and similar across attainment levels, while that of income turns out to be insignificant. Evaluating all variables at their means, a one standard deviation rise in the proportion of the working age population with primary education leads to a 16.3 percentage points higher probability of a country becoming a stable democracy on average.[9] A similar effect is found for higher education where a one standard deviation increase leads to a rise in probability of 15.7 percentage points for a stable transition.

In columns (2) to (6) of Table 2 we control sequentially for effects arising through the distribution of education between males and females and/or across age groups. We form educational attainment variables based on two age groups, the *young*(er) and *old*(er) working age population, composed by people with ages between 15 and 39 and between 40 to 64, respectively. Educational variables based on these age groups are added as explanatory covariates to the base regression. In particular, we create gap variables corresponding to differences in the corresponding educational attainment shares between males and females (gender gap variables) as well as between the young and old age groups (age difference variables).

Controlling for the gender gap variables in columns (2) to (4) does not qualitatively affect

[8] We use the term *primary education* and *higher education* to refer to the educational attainment corresponding to these variables throughout the text.

[9] All explanatory variables have been standardized to have mean zero and unit variance prior to estimation. Descriptive statistics of all the original variables in the analysis can be found in the Appendix.

Table 2: Probit regressions: Basic model and education variables

	(1)	(2)	(3)	(4)	(5)	(6)
Primary education (15-64)	0.163***	0.169***	0.173***	0.169***	0.165***	0.182***
	(0.049)	(0.050)	(0.054)	(0.049)	(0.053)	(0.061)
Higher education (15-64)	0.157***	0.165**	0.142**	0.151**	0.106	0.094
	(0.052)	(0.065)	(0.067)	(0.062)	(0.068)	(0.068)
Ln(GDP pc)	-0.003	-0.014	-0.018	-0.008	0.013	-0.017
	(0.054)	(0.058)	(0.060)	(0.056)	(0.057)	(0.062)
Gender gap primary (15-64)		0.017				
		(0.058)				
Gender gap higher (15-64)		-0.099**				
		(0.047)				
Gender gap primary (15-39)			0.033			
			(0.060)			
Gender gap higher (15-39)			-0.135***			
			(0.051)			
Gender gap primary (40-64)				-0.036		
				(0.055)		
Gender gap higher (40-64)				-0.030		
				(0.050)		
Age difference primary					-0.094	
					(0.066)	
Age difference higher					-0.053	
					(0.064)	
Age difference gender gap primary						0.059
						(0.053)
Age difference gender gap higher						-0.104*
						(0.064)
N	100	100	100	100	100	100
Pseudo-R^2	0.159	0.197	0.219	0.167	0.172	0.205

The dependent variable takes value one for sustained democratic episodes.
Marginal effects reported; standard errors in parenthesis. All explanatory variables are standardized.
* (**) [***] stands for significance at the 10% (5%) [1%] level.

the estimates of the variables included in the base specification. Controlling for gender gaps in the working age population in column (2), the natural logarithm of *per capita* GDP stays insignificant, while primary and higher educational attainment are significant and positively related to democratization. The gender gap in primary education is statistically insignificant, while the gender gap in higher education has a significantly negative parameter estimate. This is in line with the findings of Barro (1999), Casteló-Climent (2008) and Lutz et al. (2009) that a more equal distribution of education between males and females rises the probability of democratization. On average, for the same level of overall education, two societies that differ in one standard deviation in terms of the gender gap in higher education differ in the probability of becoming a sustained democracy by 9.9 percentage points, where the country with a lower gap has a higher likelihood of being a sustainable democracy. The results presented in columns (3) and (4) of Table 2 correspond to models which concentrate on tighter age groups than the standard 15-64 age bracket when defining the education gender gap variables. In particular, in column (3) we control for gender gaps by educational level in the younger working age population and in column (4) for gender gaps in the older working age population. The coefficient of the gender gap in higher education stays significantly negative for the young working age population, indicating the importance of an equally distributed education among young people to ensure the stability of democratic regimes. The gender gap in primary education is insignificant for both subgroups once that overall educational attainment is controlled for.

Concentrating on the distribution of education between age groups, the results in column (5) of Table 2 show that the difference in education between young and old age groups does not appear to be a significant driver of democratization beyond the global level of educational attainment. In alternative specifications that do not include the higher educational attainment variable (not shown here but available from the authors upon request) the parameter estimate of the primary education attainment difference across age groups is significantly. Although this provides some evidence that more equality in primary education between age groups might also act as a driver of democratization, it is not clear if the result is driven indeed by smaller age gaps or, in contrast, by the higher level of education in those countries. Age differences in primary education are highly correlated to higher education (-0.68), while the correlation of age differences in higher education with the proportion of people in higher education is somewhat lower (0.53).

In the last column of Table 2 we assess the potential effect of changes of inequality in

education by controlling for differences in gender gaps between the young and the old working age population of a country. If a closing gender gap between the two generations leads to higher probabilities of becoming a sustained democracy, we expect a negative coefficient estimate in the variables. The effect of such gender-age education gap variables in primary education turns out to be insignificant, while the one for higher education is marginally significant at the 10 percent level.[10]

In Table 3 we expand the base regression including demographic variables. Potential age structure effects are analysed including variables that measure the proportion of population in different age brackets (population below age 15, between ages 15 and 39, between ages 15 and 64 and above age 65) over total population as regressors in a sequential manner. In columns (5) to (7) we also control for dependency ratios, based on the working age population instead of on the whole population. The coefficient estimates of the base regressors are not affected by the sequential inclusion of the age group variables. All of the additional regressors that control for demographic structures turn out to have insignificant coefficients. However, due to the high correlation with some age cohort variables[11] specifications estimated omitting the high education variable lead to significantly negative coefficient estimates for the proportion of population with ages below 15 and their age dependency ratio, and significantly positive coefficients for the proportion of population aged 65 or over and their age dependency ratio. These results suggest that a smaller proportion of children in the population—because of lower fertility rates—and bigger proportions of the population over 65 years—because of higher life expectancy or population pyramids with a smaller base—result in a higher probability of a transition to a stable democracy. Given the impossibility of disentangling such effects from those of the higher education attainment variable, these demographic structures can be interpreted as a proxy for human capital accumulation. Furthermore, the results do not confirm the existence of an (unconditional) youth bulge effect in terms of transitions to sustained democracy.

Table 4 controls for additional demographic factors. Fertility rates, birth rates, as well as different mortality indicators as a proxy of health and poverty are included as potential determinants of the probability of becoming a stable democratic regime. The inclusion

[10] Also, not controlling for higher education leads to a significantly negative coefficient of the gender gap difference between age groups for higher education.

[11] Higher education is highly correlated (correlation above 0.7) with the proportion of population under 15 years of age, and the proportion of people in the working age population in total population, as well as the age dependency ratio, and the age dependency ratio of young population. The correlation is still high (over 0.6) with people aged over 65 years and the old age dependency ratio.

Table 3: Probit regressions: Age structure controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary education (15-64)	0.163***	0.163***	0.163***	0.160***	0.163***	0.163***	0. 157***
	(0.049)	(0.048)	(0.049)	(0.049)	(0.049)	(0.049)	(0.050)
Higher education (15-64)	0.153**	0.146***	0.166**	0.134**	0.159**	0.151**	0. 134**
	(0.065)	(0.056)	(0.065)	(0.060)	(0.063)	(0.064)	(0.059)
Ln(GDP pc)	-0.005	-0.010	0.003	-0.011	-0.001	-0.007	-0.011
	(0.060)	(0.057)	(0.061)	(0.055)	(0.060)	(0.060)	(0.055)
Prop <15	-0.007						
	(0.069)						
Prop 15-39		0.030					
		(0.049)					
Prop 15-64			-0.016				
			(0.069)				
Prop 65+				0.040			
				(0.054)			
Age dependency					0.004		
					(0.066)		
Age dependency <15						-0.011	
						(0.068)	
Age dependency 65+							0.043
							(0.052)
N	100	100	100	100	100	100	100
Pseudo-R^2	0.160	0.163	0.160	0.163	0.159	0.160	0.164

The dependent variable takes value one for sustained democratic episodes.
Marginal effects reported; standard errors in parenthesis. All explanatory variables are standardized.
* (**) [***] stands for significance at the 10% (5%) [1%] level.

of these variables leads to a drop in significance for the education variables of the base specification, what can be attributed to the high correlation of the demographic measures with higher education.[12] Fertility rates, birth rates, and infant mortality turn out to have a significant influence on the transition probability, with the expected negative sign. Life expectancy, as expected, has a significantly positive coefficient. The death rate turns out to be an insignificant regressor.[13] Thus, the results here partly confirm the findings from above where we controlled for different age cohorts. Evaluating all variables at their means, a one standard deviation decrease in the fertility rate or birth rate rises the probability of a transition to sustained democracy by 24 percentage points or 16 percentage points, respectively. Decreasing mortality rates also leads to a higher probability of a transition by 28 percentage points in the case of infant mortality. A one standard deviation increase in life expectancy leads *ceteris paribus* to an increase in the transition probability of 19 percentage points.

In alternative specifications presented in Tables 5, 6 and 7, we include variables related to other socioeconomic aspects that have been proposed as factors affecting democratization. Motivated by López-Córdova and Meissner (2005), we test for effects of trade openness on the transition to a stable democracy using alternatively measures of exports, imports and total trade as a share of GDP. While the coefficients of the base variables do not change qualitatively when controlling for trade flows we find an insignificant effect of all three openness indicators on the probability of a transition to sustained democracy and thus cannot confirm the findings of López-Córdova and Meissner of greater openness leading to democratization beyond the effects captured by the education variables (see Table 5). Adding the fraction of the population living in urban areas to the base specification in column (4) of Table 5, this variable is found to have a significantly positive effect on the transition to stable democracy, what confirms the findings of Casteló-Climent. The estimates of the influence of the education variables do not change qualitatively, although the effect of GDP *per capita* turns significantly negative when controlling for urbanization. We also study the effect of colonial history by introducing a dummy which is equal to one for countries which were colonies of France, Spain, and the UK in the past. The results shown in column (5) of Table 5 suggest that while the colonial history of a country has been shown to have a significant impact on the democratization process (see Barro, 1999; Lipset, 1994; Acemoglu

[12]Higher education is highly correlated (correlation of above 0.7 in absolute values) with the fertility rate, the birth rate, infant mortality, and life expectancy.

[13]Leaving out higher education results in a significantly negative coefficient for the death rate as well.

Table 4: Probit regressions: Other demographic controls

	(1)	(2)	(3)	(4)	(5)
Primary education (15-64)	0.116**	0.136***	0.072	0.097*	0.121**
	(0.050)	(0.051)	(0.061)	(0.059)	(0.055)
Higher education (15-64)	-0.026	0.043	0.006	0.064	0.119**
	(0.085)	(0.084)	(0.077)	(0.071)	(0.060)
Ln(GDP pc)	-0.051	-0.046	-0.106	-0.081	-0.039
	(0.058)	(0.061)	(0.069)	(0.071)	(0.063)
Fertility	-0.242***				
	(0.091)				
Birth rate		-0.159*			
		(0.095)			
Infant mortality			-0.283***		
			(0.104)		
Life expectancy				0.188*	
				(0.097)	
Death rate					-0.106
					(0.075)
N	100	100	100	100	100
Pseudo-R^2	0.215	0.182	0.218	0.185	0.173

The dependent variable takes value one for sustained democratic episodes.
Marginal effects reported; standard errors in parenthesis. All explanatory variables are standardized.
* (**) [***] stands for significance at the 10% (5%) [1%] level.

Table 5: Other control variables: openness, urbanization, and colonial history

	(1)	(2)	(3)	(4)	(5)
Primary education (15-64)	0.183***	0.180***	0.160***	0.166***	0.160***
	(0.054)	(0.055)	(0.049)	(0.048)	(0.048)
Higher education (15-64)	0.178***	0.198***	0.160***	0.129**	0.177***
	(0.061)	(0.062)	(0.053)	(0.055)	(0.058)
Ln(GDP pc)	-0.013	0.002	-0.003	-0.182*	-0.004
	(0.057)	(0.060)	(0.054)	(0.095)	(0.055)
Ln(Imports/GDP)	-0.010				
	(0.049)				
Ln(Exports/GDP)		-0.066			
		(0.058)			
Ln(TradeVolume/GDP)			-0.033		
			(0.042)		
Urbanization				0.237***	
				(0.089)	
Colony dummy					0.084
					(0.105)
N	88	88	100	100	100
Pseudo-R^2	0.175	0.186	0.164	0.212	0.165

The dependent variable takes value one for sustained democratic episodes.
Marginal effects reported; standard errors in parenthesis. All explanatory variables are standardized.
* (**) [***] stands for significance at the 10% (5%) [1%] level.

et al., 2001) we do not find this variable having a significant effect on the probability of a country to become a stable democracy.

The results in Acemoglu and Robinson (2000) and Bourguignon and Verdier (2000) suggest that income inequality matters for democratization. Following Barro (1999), Przeworski et al. (2000), Glaeser et al. (2004), and Casteló-Climent (2008), in Table 6 we show the results of controlling for economic and other dimensions of inequality, such as ethnolinguistic fractionalization and polarization, as well as the concentration of religion and the the share of Muslims in total population which has been found to have a negative effect on democratization (see Casteló-Climent, 2008). All of the inequality measures included additionally in the regressions (net and gross Gini indicators, measures for ethnolinguistic fractionalization and polarization, as well as the religion concentration index) turn out to be insignificantly re-

Table 6: Other control variables: inequality and religion

	(1)	(2)	(3)	(4)	(5)	(6)
Primary education (15-64)	0.228***	0.232***	0.159***	0.158***	0.164***	0.103*
	(0.082)	(0.082)	(0.049)	(0.049)	(0.049)	(0.056)
Higher education (15-64)	0.190**	0.161*	0.153***	0.153***	0.164***	0.117**
	(0.085)	(0.088)	(0.051)	(0.051)	(0.061)	(0.054)
Ln(GDP pc)	0.074	0.066	0.007	0.009	-0.011	0.020
	(0.083)	(0.083)	(0.053)	(0.052)	(0.066)	(0.057)
Gini net	0.086					
	(0.081)					
Gini gross		0.031				
		(0.078)				
Fractionalization			-0.040			
			(0.050)			
Polarization				-0.051		
				(0.049)		
Religion concentration					0.012	
					(0.054)	
Muslim						-0.110*
						(0.063)
N	66	66	100	100	100	100
Pseudo-R^2	0.209	0.196	0.165	0.169	0.160	0.186

The dependent variable takes value one for sustained democratic episodes.
Marginal effects reported; standard errors in parenthesis. All explanatory variables are standardized.
* (**) [***] stands for significance at the 10% (5%) [1%] level.

lated to a transition to sustained democracy. The coefficient of the share of Muslims in total population, in contrast, is significantly negative, confirming the findings of Casteló-Climent (2008). The coefficients of the base variables are, again, not qualitatively affected.

In Table 7 we also control for the availability of natural resources. Including total natural resource rents as a regressor, we find a significantly negative relationship with the transition to sustained democracy, indicating that a one standard deviation increase in natural resource rents lowers the probability of becoming a sustained democracy by 17 percent. We control sequentially for forest rents, mineral rents, coal, gas, and oil rents. While forest rents turn out to have a significantly positive effect on transition probability, only oil rents are found to

Table 7: Other control variables: natural resources

	(1)	(2)	(3)	(4)	(5)	(6)
Primary education (15-64)	0.173***	0.138**	0.195***	0.166	0.206**	0.204**
	(0.057)	(0.059)	(0.057)	(0.112)	(0.083)	(0.081)
Higher education (15-64)	0.193***	0.186***	0.178***	0.226*	0.214***	0.193***
	(0.059)	(0.065)	(0.060)	(0.117)	(0.070)	(0.071)
Ln(GDP pc)	-0.003	0.119*	0.008	0.135	0.032	0.052
	(0.061)	(0.071)	(0.060)	(0.116)	(0.083)	(0.076)
Ln(Natural resources)	-0.172***					
	(0.052)					
Ln(Forest)		0.316**				
		(0.137)				
Ln(Mineral)			0.001			
			(0.054)			
Ln(Coal)				-0.095		
				(0.124)		
Ln(Gas)					-0.127	
					(0.078)	
Ln(Oil)						-0.136*
						(0.070)
N	87	85	87	34	62	63
Pseudo-R^2	0.272	0.261	0.187	0.282	0.205	0.206

The dependent variable takes value one for sustained democratic episodes.
Marginal effects reported; standard errors in parenthesis. All explanatory variables are standardized.
* (**) [***] stands for significance at the 10% (5%) [1%] level.

have a significantly negative coefficient, which is slightly lower than the one of the aggregate of natural resource rents and equal to around -0.14. Our results are in line with Barro (1999) and Crespo Cuaresma et al. (2011), who argue that income that is generated from natural resources lowers the pressure for democratization and tends to prolonge the duration of autocratic regimes. The coefficient estimates of the education variables are not affected qualitatively by including these controls, although the income variable turns significantly positive in the specification which accounts for forest rents.

Given the relatively small number of observations and the strong correlation across variables, all the estimation results shown were based on small specifications where additional variables

were added sequentially to the base model, keeping a limited size of the estimated model. We also estimated alternative specifications based on general-to-specific model specifications where, starting with a saturated model, we recursively excluded insignificant variables. The estimation of this model (not shown here but available from the authors upon request) reinforces our previous results concerning the importance of primary schooling, fertility, urbanization and natural resources as empirical determinants of stable democracies.

3 Robustness to Definitions of Sustained Democracy

We address the robustness of our results to the definition of sustained political regimes by classifying our observations based on different spans of regime classification. We reestimate the models using classifications based on 1, 5, 10, and 20 years.[14] The sign and significance of the coefficient of the vast majority of our explanatory variables is not affected by varying the length of sustained regimes. There are however several interesting exceptions. As we decrease the length of the time period without regime change needed for a classification into regime types—thus sequentially allowing for shorter-lived democracies—the education attainment and educational gender gap variables lose significance. For the difference in gender gaps between the young and old population in higher education, the opposite is true, as the coefficient of this variable becomes significantly negative as we allow for regimes whose stability is based on shorter spans. The share of young people in the population as well as the death rate are found to have a significantly negative effect on democratization for regime classifications based on shorter time windows, but insignificant for sustained regime changes. The role that the youth bulge plays as a determinant of the birth of democratic regimes seems to be thus constrained to relatively fragile episodes of democracy, once that educational variables are controlled for. Variables that, in contrast, become more important as we place stronger emphasis on the sustainability dimension are income inequality, the share of Muslims in the population and coal, gas, and oil rents, which have a significantly negative impact on sustained democratic transitions.

It could be argued that institutional changes tend to take place already before the formal classification into sustained democracy. We conduct further robustness checks to confirm that our results are not driven by this potential problem. We reestimate the models after dropping from our sample those democratic countries with a change in their polity score

[14]The sample sizes for the base specifications are 147, 132, 122, and 77, respectively.

of less than 8 within 4 years prior to their classification as sustained democracy, as well as autocratic countries with a positive change in their polity score. The results presented in our study do not change qualitatively when based in this reduced group of countries.[15] Next, we drop every country that had a polity score higher than -4 four years prior to the classification of countries into sustained regimes. The results are robust to this change in the sample of countries. [16] We conduct addtional robustness checks by varying the threshold value for classifying countries into the democratic and autocratic groups and by ruling out the possibility that a country is classified as a sustained democracy when it has already had a polity score above the threshold within the last 20, 30, or 40 years. The main results are not qualitatively affected by these redefinitions of the dependent variable.

To sum up, these findings suggest that higher educational attainment levels, as well as decreasing gender gaps in education, especially among the young population are essential for sustained democratization, while oil rents are found to have a negative impact on sustained democratization. Despite their influence on sustained democratizations, all of these factors play a minor role for transitions that are followed by potentially unstable regimes. The difference in gender gaps between the young and old population in higher education as well as the share of young people in the population, in contrast are important for democratic transitions, but not necessarily for transitions to stable regimes.

IV Conclusions

We analyse the role of education, demography, and other socioeconomic factors as a determinant of transitions to stable democratic regimes. Colonial history, trade, and inequality measures, which are often proposed by the literature to influence (not necessarily sustain-

[15]The reduced sample does not contain Guatemala, Honduras, Mexico, Nicaragua, and Suriname in the democratic sample and Cameroon, China, Egypt, Gabon, Guinea, and Paraguay from the autocratic sample. In some specifications higher education and GDP *per capita* gain significance in this robustness check, while primary education becomes insignificant in one specification. Also the difference between the gender gaps between the young and the old working age population in higher education becomes significantly negative.

[16]This applies to Cape Verde, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Suriname for the democratic sample and Cape Verde, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Suriname for the autocratic sample. These countries are dropped before reestimating the model specifications. Higher education and GDP *per capita* gain significance, while primary education turns insignificant in some specifications. Furthermore, life expectancy turns insignificant, while the age difference in primary education turns significantly negative, and the difference between the gender gaps between the young and the old working age population in primary education turns significantly positive, while the one for higher education turns significantly negative.

able) democratic transitions, do not appear to affect sustainable transitions to democracy. On the other hand, education levels, inequality in education, and demographic structures appear as robust determinants of sustained democratizations.

Our findings suggest that primary, as well as higher education are important drivers of transitions towards sustained democracy, while the effect of GDP *per capita* seems to be a weaker driver of stable political change once that human capital is controlled for. Following Lipset's hypothesis, our results indicate that economic development can be seen as a precondition to democratization but only as the initiator of a transition towards democracy if it is accompanied by broad-based improvements in educational attainment. The effect of the indicators for equality in education used in our study indicate that policies aimed at equality in educational attainment can have an extra social return related to the development of stable democratic institutions.

A Data Appendix

1 Variable definitions

Variable	**Explanation**	**Source**
sustained Democracy	Dummy variable equal to one for countries classified as sustained democracy.	Marshall, Gurr, and Jaggers (2011), own calculations.
Primary education (15-64)	Proportion of the working age population aged 15-64 years with primary education.	Lutz, Goujon, K.C., and Sanderson (2007), own calculations.
Higher education (15-64)	Proportion of the working age population aged 15-64 years with secondary or tertiary education.	Lutz, Goujon, K.C., and Sanderson (2007), own calculations.
Ln(GDP pc)	PPP converted GDP *per capita* (Laspeyres), at 2005 constant prices, natural logarithm.	Heston, Summers, and Aten (2012).
Gender gap primary (15-64)	Proportion of the male working age population (15-64) with primary education minus the proportion of the female working age population (15-64) with primary education.	Lutz, Goujon, K.C., and Sanderson (2007), own calculations.
Gender gap higher (15-64)	Proportion of the male working age population (15-64) with primary education minus the proportion of the female working age population (15-64) with secondary or tertiary education.	Lutz, Goujon, K.C., and Sanderson (2007), own calculations.
Gender gap primary (15-39)	Proportion of the male population aged between 15 and 39 years with primary education minus the proportion of the female population aged between 15 and 39 years with primary education.	Lutz, Goujon, K.C., and Sanderson (2007), own calculations.
Gender gap higher (15-39)	Proportion of the male population aged between 15 and 39 years with secondary or tertiary education minus the proportion of the female population aged between 15 and 39 years with secondary or tertiary education.	Lutz, Goujon, K.C., and Sanderson (2007), own calculations.
Gender gap primary (40-64)	Proportion of the male population aged between 40 and 64 years with primary education minus the proportion of the female population aged between 40 and 64 years with primary education.	Lutz, Goujon, K.C., and Sanderson (2007), own calculations.
Gender gap higher (40-64)	Proportion of the male population aged between 40 and 64 years with secondary or higher education minus the proportion of the female population aged between 40 and 64 years with secondary or tertiary education.	Lutz, Goujon, K.C., and Sanderson (2007), own calculations.
Age difference primary	Share of people aged between between 19 and 39 years with primary education minus the share of people aged between 40 and 64 with primary education.	Lutz, Goujon, K.C., and Sanderson (2007), own calculations.
Age difference higher	Share of people aged between between 19 and 39 years with secondary or tertiary education minus the share of people aged between 40 and 64 with secondary or tertiary education.	Lutz, Goujon, K.C., and Sanderson (2007), own calculations.
Age difference gender gap primary	Gender gap in primary education of people aged between 15 and 39 minus the gender gap in primary education of people aged between 15 and 39.	Lutz, Goujon, K.C., and Sanderson (2007), own calculations.
Age difference gender gap higher	Gender gap in secondary or tertiary education of people aged between 15 and 39 minus the gender gap in secondary or tertiary education of people aged between 15 and 39.	Lutz, Goujon, K.C., and Sanderson (2007), own calculations.
Prop <15	Proportion of people younger than 15 years of total population.	United Nations (2010), own calculations.
Prop 15-39	Proportion of people aged between 15 and 39 years of total population.	United Nations (2010), own calculations.

Prop 15-64	Proportion of people aged between 15 and 64 years of total population.	United Nations (2010), own calculations.
Prop 65+	Proportion of people older than 65 years of total population.	United Nations (2010), own calculations.
Age dependency	Ratio of people younger than 15 or older than 64 years to the working age population (between 15 and 64 years).	World Bank (2012).
Age dependency <15	Ratio of people younger than 15 to the working age population (between 15 and 64 years).	World Bank (2012).
Age dependency 65+	Ratio of people older than 64 years to the working age population (between 15 and 64 years).	World Bank (2012).
Fertility	The average number of children a hypothetical cohort of women would have at the end of their reproductive period if they were subject during their whole lives to the fertility rates of a given period and if they were not subject to mortality. It is expressed as children per woman.	United Nations (2010), own calculations.
Birth rate	Number of births over a given period divided by the person-years lived by the population over that period. It is expressed as number of births per 1,000 population.	United Nations (2010), own calculations.
Infant mortality	Probability of dying between birth and exact age 1. It is expressed as deaths per 1,000 births.	United Nations (2010), own calculations.
Life Expectancy	The average number of years of life expected by a hypothetical cohort of individuals who would be subject during all their lives to the mortality rates of a given period. It is expressed as years.	United Nations (2010), own calculations.
Death rate	Number of deaths over a given period divided by the person-years lived by the population over that period. It is expressed as number of deaths per 1,000 population.	United Nations (2010), own calculations.
Ln(Imports/GDP)	Imports of goods and services as a percentage of GDP represent the value of all goods and other market services received from the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments. In logarithm.	World Bank (2012).
Ln(Exports/GDP)	Exports of goods and services as a percentage of GDP represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments.	World Bank (2012).
Ln(TradeVolume/GDP)	Sum of exports and imports of goods and services measured as a share of GDP.	World Bank (2012).
Urbanization	Urban population refers to people living in urban areas defined by national statistical offices as a percentage of total population. It is calculated using World Bank population estimates and urban ratios from the United Nations World Urbanization Prospects.	World Bank (2012).
Colony	Dummy variable equal to one if the country was colonized by either France, Spain, or the UK. The colonizer is defined as colonizing the country for a relatively long period of time with substantial participation in the governance of the colonized country.	Mayer and Zignag (2011).
Gini net	Comparable Gini index of net income inequality.	Solt (2009).

Gini gross	Comparable Gini index of gross income inequality.	Solt (2009).
Fractionalization	The probability that two randomly picked individuals belong to different groups at the most aggregated level.	Desmet, Ortuno-Ortin, and Wacziarg (2012).
Polarization	Linguistic polarization index that is maximized when there are two groups of equal size. Polarization measure from Montalvo and Reynal-Querol (2005).	Desmet, Ortuno-Ortin, and Wacziarg (2012).
Religion concentration	Herfindahl index of religion shares, including non-religion.	Barro (2003).
Muslim	Share of Muslims in total population.	Barro (2003).
Ln(Natural resources)	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents, as a percentage of GDP. Natural logarithm.	World Bank (2012).
Ln(Forest)	Forest rents are roundwood harvest times the product of average prices and a region-specific rental rate, as a percentage of GDP. Natural logarithm.	World Bank (2012).
Ln(Mineral)	Mineral rents are the difference between the value of production for a stock of minerals at world prices and their total costs of production, as a percentage of GDP. Minerals included in the calculation are tin, gold, lead, zinc, iron, copper, nickel, silver, bauxite, and phosphate. Natural logarithm.	World Bank (2012).
Ln(Coal)	Coal rents are the difference between the value of both hard and soft coal production at world prices and their total costs of production, a a percentage of GDP. Natural logarithm.	World Bank (2012).
Ln(Gas)	Natural gas rents are the difference between the value of natural gas production at world prices and total costs of production, as a percentage of GDP. Natural logarithm.	World Bank (2012).
Ln(Oil)	Oil rents are the difference between the value of crude oil production at world prices and total costs of production, as a percentage of GDP. Natural logarithm.	World Bank (2012).

2 *Descriptive statistics*

Table 9: Summary statistics

Variable	N	Mean	Std. Dev.	Min.	Max.
Sustained Democracy	100	0.290	0.456	0.000	1.000
Primary education (15-64)	100	0.310	0.190	0.023	0.722
Higher education (15-64)	100	0.266	0.273	0.004	0.945
Ln(GDP pc)	100	7.696	1.042	5.830	10.798
Gender gap primary (15-64)	100	0.059	0.088	-0.238	0.301
Gender gap higher (15-64)	100	0.070	0.061	-0.037	0.265
Gender gap primary (15-39)	100	0.058	0.093	-0.234	0.338
Gender gap higher (15-39)	100	0.071	0.071	-0.061	0.313
Gender gap primary (40-64)	100	0.062	0.104	-0.257	0.302
Gender gap higher (40-64)	100	0.062	0.065	-0.046	0.319
Age difference primary	100	0.053	0.147	-0.338	0.334
Age difference higher	100	0.123	0.102	-0.014	0.469
Age difference gender gap primary	100	-0.003	0.091	-0.219	0.235
Age difference gender gap higher	100	0.008	0.074	-0.243	0.167
Prop <15	100	0.405	0.077	0.207	0.504
Prop 15-39	100	0.332	0.024	0.285	0.407
Prop 15-64	100	0.567	0.062	0.477	0.705
Prop 65+	100	0.047	0.028	0.014	0.141
Age dependency	100	81.489	16.766	46.022	111.993
Age dependency <15	100	73.511	19.428	29.365	105.327
Age dependency 65+	100	7.978	3.780	2.212	20.141
Fertility	100	5.110	1.863	1.287	7.953
Birth rate	100	36.269	11.918	9.000	55.714
Infant mortality	100	87.824	47.268	13.000	188.000
Life Expectancy	100	56.706	10.862	34.829	74.140
Death rate	100	13.709	6.012	2.871	29.476
Ln(Imports/GDP)	88	3.422	0.567	1.959	5.029
Ln(Exports/GDP)	88	3.119	0.625	1.682	4.849
Ln(TradeVolume/GDP)	100	3.838	0.723	1.696	5.221
Urbanization	100	38.636	21.132	3.122	91.710
Colony	100	0.610	0.490	0.000	1.000
Gini net	66	40.071	10.935	20.010	58.640
Gini gross	66	45.828	11.923	22.982	72.911
Fractionalization	100	0.150	0.175	0.000	0.647
Polarization	100	0.273	0.305	0.000	0.997
Religion concentration	100	0.608	0.214	0.177	1.000
Muslim	100	0.268	0.351	0.000	0.997
Ln(Natural resources)	87	1.634	1.317	-2.164	4.701
Ln(Forest)	85	-0.485	4.618	-27.631	3.325
Ln(Mineral)	87	-11.006	12.657	-27.631	2.957
Ln(Coal)	34	-6.479	9.206	-27.631	1.498
Ln(Gas)	62	-13.152	13.439	-27.631	4.493
Ln(Oil)	63	-9.079	13.835	-27.631	3.760

Table 10: Summary statistics for sustained autocracies

Variable	N	Mean	Std. Dev.	Min.	Max.
Sustained Democracy	71	0	0	0	0
Primary education (15-64)	71	0.2769808	0.1859092	0.0228403	0.7222776
Higher education (15-64)	71	0.2187055	0.2604057	0.003953	0.9454886
Ln(GDP pc)	71	7.534988	1.005806	5.953117	10.79756
Gender gap primary (15-64)	71	0.0718353	0.0919568	-0.2382785	0.3008336
Gender gap higher (15-64)	71	0.0787629	0.0625093	-0.0310601	0.2652708
Gender gap primary (15-39)	71	0.0706619	0.1007552	-0.2335641	0.3376227
Gender gap higher (15-39)	71	0.0852015	0.0726396	-0.0238359	0.3127269
Gender gap primary (40-64)	71	0.0737501	0.1044698	-0.2571845	0.3019834
Gender gap higher (40-64)	71	0.0594278	0.0606467	-0.0461341	0.2153649
Age difference primary	71	0.0820596	0.1272622	-0.3382764	0.3336853
Age difference higher	71	0.1063848	0.0946735	-0.0144402	0.3731081
Age difference gender gap primary	71	-0.0030882	0.0964502	-0.2185826	0.2354707
Age difference gender gap higher	71	0.0257738	0.0686777	-0.1866037	0.1666486
Prop <15	71	0.4170658	0.0692761	0.2068285	0.5041659
Prop 15-39	71	0.3282139	0.0194291	0.2853803	0.4035589
Prop 15-64	71	0.5585853	0.0576554	0.4770745	0.7050869
Prop 65+	71	0.0419334	0.0231754	0.0143358	0.1388962
Age dependency	71	83.8784	15.71753	46.02231	111.9925
Age dependency <15	71	76.59744	17.73382	29.36535	105.3268
Age dependency 65+	71	7.28095	3.105862	2.212222	19.66516
Fertility	71	5.612546	1.693806	1.286667	7.953125
Birth rate	71	39.13911	10.84978	9	55.71429
Infant mortality	71	101.0058	44.32882	13	188
Life Expectancy	71	53.90968	10.39805	34.82857	72.68613
Death rate	71	15.12511	6.076022	2.870968	29.47619
Ln(Imports/GDP)	60	3.415615	0.565159	2.227416	4.555392
Ln(Exports/GDP)	60	3.101612	0.6497937	1.681576	4.548329
Ln(TradeVolume/GDP)	71	3.871084	0.7590604	1.696368	5.221024
Urbanization	71	33.98446	20.20554	3.12215	91.71018
Colony	71	0.6197183	0.4889112	0	1
Gini net	41	39.63182	10.7134	20.01046	58.64023
Gini gross	41	45.70879	12.73624	22.98208	70.58811
Fractionalization	71	0.1593535	0.1743235	0	0.5499
Polarization	71	0.2927423	0.3104921	0	0.9685
Religion concentration	71	0.6069916	0.209067	0.2575825	1
Muslim	71	0.3408084	0.372918	0	0.9970909
Ln(Natural resources)	58	1.961419	1.18959	-1.231354	4.701366
Ln(Forest)	56	-0.8042202	5.607875	-27.63102	3.325389
Ln(Mineral)	58	-11.38229	12.58325	-27.63102	2.956882
Ln(Coal)	20	-7.632162	10.48178	-27.63102	1.497516
Ln(Gas)	39	-11.68408	13.60751	-27.63102	4.492837
Ln(Oil)	39	-7.247159	13.86087	-27.63102	3.759881

Table 11: Summary statistics for sustained democracies

Variable	N	Mean	Std. Dev.	Min.	Max.
Sustained Democracy	29	1	0	1	1
Primary education (15-64)	29	0.3918276	0.1793204	0.0359376	0.6752232
Higher education (15-64)	29	0.3832673	0.2704488	0.0396101	0.9366733
Ln(GDP pc)	29	8.091129	1.038989	5.830173	9.650395
Gender gap primary (15-64)	29	0.0279991	0.0676237	-0.0732856	0.1965513
Gender gap higher (15-64)	29	0.0494336	0.0524661	-0.0373646	0.1865375
Gender gap primary (15-39)	29	0.0278506	0.0611734	-0.0674081	0.2103899
Gender gap higher (15-39)	29	0.0352273	0.0539899	-0.0607191	0.1955138
Gender gap primary (40-64)	29	0.0318553	0.0974306	-0.1664118	0.264552
Gender gap higher (40-64)	29	0.0695719	0.0741618	-0.0250465	0.3193385
Age difference primary	29	-0.0174529	0.1682601	-0.300652	0.3194541
Age difference higher	29	0.1649275	0.1086726	0.0256169	0.4693
Age difference gender gap primary	29	-0.0040047	0.0794619	-0.1972551	0.1860333
Age difference gender gap higher	29	-0.0343446	0.071496	-0.2425855	0.0534916
Prop <15	29	0.3747902	0.0868201	0.2132127	0.4825551
Prop 15-39	29	0.3408966	0.0317572	0.2887768	0.4072282
Prop 15-64	29	0.5887262	0.0677857	0.5014321	0.7040341
Prop 65+	29	0.0593961	0.0354209	0.0298187	0.1409416
Age dependency	29	75.63747	18.06578	47.02202	102.146
Age dependency <15	29	65.95299	21.56526	30.46883	96.2237
Age dependency 65+	29	9.684472	4.705852	5.685187	20.14104
Fertility	29	3.879655	1.700652	1.5	7.01
Birth rate	29	29.24138	11.65472	10	49
Infant mortality	29	55.55172	38.31037	13	134
Life Expectancy	29	63.55276	8.858012	44.13	74.14
Death rate	29	10.24138	4.239737	5	20
Ln(Imports/GDP)	28	3.436478	0.5814831	1.959435	5.029167
Ln(Exports/GDP)	28	3.157598	0.5769437	1.896513	4.84855
Ln(TradeVolume/GDP)	29	3.757173	0.6295515	2.412162	5.071878
Urbanization	29	50.02327	19.21258	12.9224	87.194
Colony	29	0.5862069	0.50123	0	1
Gini net	25	40.79087	11.4755	20.8216	58.46661
Gini gross	25	46.02419	10.70461	26.51189	72.91129
Fractionalization	29	0.1274448	0.1791687	0	0.6466
Polarization	29	0.2249034	0.2916121	0	0.9974
Religion concentration	29	0.6107806	0.2302169	0.177126	0.939498
Muslim	29	0.0885517	0.2057737	0	0.822
Ln(Natural resources)	29	0.9784243	1.333932	-2.163747	3.168397
Ln(Forest)	29	0.1322243	1.267044	-3.080206	2.286761
Ln(Mineral)	29	-10.25421	12.99309	-27.63102	2.78427
Ln(Coal)	14	-4.832243	7.042781	-27.63102	1.174318
Ln(Gas)	23	-15.64066	13.06416	-27.63102	1.628898
Ln(Oil)	24	-12.05474	13.55135	-27.63102	1.916684

References

Acemoglu, D., Johnson, S., Robinson, J., and Yared, P. (2009). Reevaluating the modernization hypothesis. *Journal of Monetary Economics*, 56:1043–1058.

Acemoglu, D., Johnson, S., and Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. *The American Economic Review*, 91, No. 5:1369–1401.

Acemoglu, D., Johnson, S., Robinson, J. A., and Yared, P. (2005). From education to democracy? *The American Economic Review*, 95, No. 2:44–49.

Acemoglu, D. and Robinson, J. A. (2000). Why did the west extend the franchise? democracy, inequality and growth in historical perspective. *The Quaterly Journal of Economics*, pages 1167–1199.

Alvarez, M., Cheibub, J. A., Limongi, F., and Przeworski, A. (1996). Classifying political regimes. *Studies in Comparative International Development*, Vol 31, No. 2:3–36.

Alvarez, M., Cheibub, J. A., Limongi, F., and Przeworski, A. (1999). ACLP political and economic database.

Barro, R. J. (1998). *Determinants of Economic Growth: A Cross-Country Empirical Study*. The MIT Press.

Barro, R. J. (1999). Determinants of democracy. *The Journal of Political Economy*, 107, No. 6:158–183.

Bobba, M. and Coviello, D. (2007). Weak instruments and weak identification, in estimating the effects of education, on democracy. *Economics Letters*, 96:301–306.

Bourguignon, F. and Verdier, T. (2000). Oligarchy, democracy, inequality and growth. *Journal of Development Economics*, 62:285–313.

Casteló-Climent, A. (2008). On the distribution of education on democracy. *Journal of Development Economics*, 87:179–190.

Cincotta, R. P. (2008). How democracies grow up. *Foreign Policy*, pages 80–82.

Crespo Cuaresma, J., Oberhofer, H., and Raschky, P. (2011). Oil and the duration of dictatorships. *Public Choice*, 148:505–530.

Dee, T. S. (2004). Are there civic returns to education? *Journal of Public Economics*, 88, Issues 9-10:1697–1720.

Gastil, R. D. (various years). Freedom in the world: Political rights and civil liberties. *Westport, Conn.: Greenwood*.

Glaeser, E. L., La Porta, R., Lopez-de Silanes, F., and Shleifer, A. (2004). Do institutions cause growth? *Journal of Economic Growth*, 9:271–303.

Glaeser, E. L., Ponzetto, G. A. M., and Shleifer, A. (2007). Why does democracy need education? *Journal of Economic Growth*, 12, No. 2:77–99.

Golder, M. (2005). Democratic electoral systems around the world, 1946-2000. *Electoral Studies*, 24:103–121.

Helliwell, J. F. (1994). Empircial linkages between democracy and economic growth. *British Journal of Political Science*, 24, No. 2:225–248.

Huntington, S. P. (1991-1992). How countries democratize. *Political Science Quarterly*, 106, No. 4:579–616.

Kaufmann, D., Kraay, A., and Mastruzzi, M. (2003). Governance matters III: Governance indicators for 1996-2002. *World Bank Policy Research Working Paper No. 3106*.

Kraay, A. and Nehru, V. (2006). When is external debt sustainable? *World Bank Economic Review*, 20, Issue 3:341–365.

Lipset, S. M. (1959). Some social requisites of democracy: Economic development and political legitimacy. *The American Political Science Review*, 53, No. 1:69–105.

Lipset, S. M. (1994). The social requisites of democracy revisited: 1993 presidential address. *American Sociological Review*, 59:1–22.

López-Córdova, J. E. and Meissner, C. M. (2005). The globalization of trade and democracy, 1870-2000. *NBER Working Paper Series*, Working Paper 11117:1–54.

Lutz, W., Crespo Cuaresma, J., and Abbasi-Shavazi, M. J. (2009). Demography, education and democracy: Global trends and the case of Iran. *IIASA Interim Report*, IR-09-019:1–31.

Lutz, W., Goujon, A., K.C., S., and Sanderson, W. (2007). Reconstruction of population by age, sex and level of educational attainment of 120 countries for 1970-2000. *Vienna Yearbook of Population Research*, pages 193–235.

Marshall, M. G., Gurr, T. R., and Jaggers, K. (2011). Polity IV project. Political regime characteristics and transitions, 1800-2011, version 2011. *Center for Systemic Peace*.

Milligan, K., Moretti, E., and Oreopoulo, P. (2004). Does education improve citizenship? evidence from the United States and the United Kingdom. *Journal of Public Economics*, 88, Issues 9-10:1667–1695.

Montalvo, J. and Reynal-Querol, M. (2005). Ethnic polarization, potential conflict and civil war. *The American Economic Review*, 95(3):796–816.

Papaioannou, E. and Siourounis, G. (2008a). Democratisation and growth. *The Economic Journal*, 118:1520–1551.

Papaioannou, E. and Siourounis, G. (2008b). Economic and social factors driving the third wave of democratization. *Journal of Comparative Economics*, 36:365–387.

Przeworski, A., Alvarez, M., Cheibub, J. A., and Limongi, F. (2000). *Democracy and development: Political institutions and well-being in the world, 1950-1990*. Cambridge University Press.

Stasavage, D. (2005). Democracy and education spending in Africa. *American Journal of Political Science*, 49, No. 2:343–358.

Vanhanen, T. (2000). A new dataset for measuring democracy, 1810-1998. *Journal of Peace Research March*, 37, No. 2:251–265.