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## **On the Endogeneity of Political Preferences: Evidence from Individual Experience with Democracy**

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### **Abstract:**

Democracies depend on the support of the general population, but little is known about the determinants of this support. This paper analyzes whether support for democracy increases with the length of time spent under the system, and whether preferences are thus affected by the political system. Relying on 380,000 individual-level observations from 104 countries over the years 1994 to 2013, and exploiting individual-level variation within a country and a given year in the length of time spent under democracy, we find evidence that political preferences are endogenous. For new democracies, our findings imply that popular support needs time to develop. To illustrate: the effect of around 8.5 more years of democratic experience corresponds to the difference in support for democracy between primary and secondary education.

Popular support for democracy is critical to the success of a democracy, and especially an emerging democracy (1, 2). Will support increase over time when a democracy emerges and the population gains experience with democracy? If so, how quickly? Or are democratic attitudes deeply ingrained in individuals, such that they are hard to change? The latest wave of democratizations in the world, which started in December 2010 in a movement often collectively referred to as the “Arab Spring”, and the subsequent struggles of these countries provide a recent illustration of the importance of these questions. However, a paper that uses a clean identification strategy based on an experimental or quasi-experimental setup to identify the causal effect of accumulating experience with democracy on support for democracy in a broad set of countries, or more generally, a paper that identifies endogenous preferences for political systems, is missing from the literature.

Indeed, recent research suggests that economic preferences are not given, but are shaped by individual experiences with markets (3). In particular, preferences regarding fairness, preferences for redistribution, and other types of preferences related to economic behavior vary across societies in a way that correlates with market characteristics (4, 5). A causal interpretation of these correlations and the view that economic preferences are endogenous is founded in theoretical arguments (6-8) and empirically supported by research based on experimental or quasi-experimental settings, such as the end of communism in Eastern Europe or the stock market return experiences accumulated over a lifetime (9-11).

Regarding the endogeneity of political preferences, research has so far shown a positive correlation between experience with political systems and political preferences at the country-level (12), a positive correlation between attitudes towards democracy and currently living under a democratic system (13), and that a longer democratic experience lowers the probability of exit from democracy and increases the probability of exit from autocracy (12). However, a causal influence of experience with democracy on the support for democracy, which would imply endogeneity of preferences, cannot be established from these correlations. The correlations could (partly) be due to reverse causality, i.e. countries have a democratic history precisely because the electorate supports democratic values, or a third, possibly unobserved, variable, such as historic events or economic conditions, could determine both individuals’ support for democracy and the political system in place.

In this paper, we exploit within-country variation at the individual level in experience with a democratic regime to establish a plausibly causal impact of experience with democracy on preferences for democracy, and thereby contribute to a better understanding of the endogeneity of political preferences. Because we control for country-year fixed effects, the observed differences in attitudes towards democracy do not simply reflect a reaction to differ-

ences in the current quality of institutions or political environments, but, under the minimal and plausible identifying assumption that we state below, constitute a change in intrinsic preferences due to differences in the length of exposure to democracy. For example, if democratic institutions or economic conditions improve with the length of time spent under democracy, this might increase the support for democracy directly and not through intrinsic preferences, but it would be captured in our specification by the country-year fixed effects, which control for all country-level unobservables that are specific to a country in a given year. Any remaining correlation between experience with democracy and support for democracy can therefore confidently be attributed to a change in preferences. We base the analysis on two different data sets: first, the World Values Surveys, which cover both developed and less developed countries across the world. Secondly, we also use data from the Afrobarometer Surveys, which allow us to specifically study African countries, many of which are still in the early stages of the transition from autocratic to democratic rule. Our empirical work is based on more than 380,000 individual-level observations, coming from 104 countries over the years 1994 to 2013.

We find that preferences for democracy increase as individuals experience more time living under democratic rule. This result is robust to different ways of measuring support for democracy and democracy itself, and across the different data sets. Our baseline estimates imply that 8.5 more years of continuously living under democratic rule increase support for democracy by as much as going from primary to secondary education as the highest educational degree. For new democracies, our findings thus imply that popular support needs time to develop.

## **Data and measurement**

Both the World Values Surveys (WVS) and the Afrobarometer Surveys are repeated cross-sectional surveys at the individual level that cover a set of questions that is consistent across countries and over time (details, including a list of countries and years covered, are in the Supplementary Online Materials text and Tables S1 and S2). For our purposes, the main differences between WVS and Afrobarometer Surveys are in the questions related to the support for democracy. For the analysis based on the WVS, we mainly use the Inglehart and Welzel index introduced in (14), abbreviated as IW-index, which is based on four different questions, where higher index numbers indicate more prodemocratic attitudes: the index ranges from -6 to 6. The index and the four questions on which it is based are described in the Supplementary Online Materials. To demonstrate robustness, we also use all four questions individually. For the analysis based on the Afrobarometer Surveys, we create a

binary variable “support for democracy” which is coded as 1 if the individual chooses the statement “Democracy is preferable to any other kind of government” over the statements “a non-democratic government can be preferable”, “it doesn’t matter” or “don’t know” (15).

**Political Regime Measurement and the Democratic Capital Stock** Our identification strategy relies on exploiting within-country variation in how long individuals have experienced democracy. To this end, we first identify periods of democratic rule using the widely used Polity 2 index from the Polity IV project (16). We follow the categorization of the Polity IV project and define democratic countries as those with a Polity 2 index of 6 or higher (in Table S4 we also use alternative approaches). In a next step, we employ the concept of democratic capital (12), and define democratic capital at the country-level as

$$\begin{aligned} democ\_cap_{jt} &= democratic_{jt} + \delta democ\_cap_{jt-1} \\ &= \sum_{\tau=t_0}^t \delta^{t-\tau} democratic_{j\tau} \end{aligned} \quad (1)$$

where subscript  $j$  represents the country and subscript  $t$  time, and  $democratic_{jt}$  is an indicator variable that takes on the value of 1 if a country is democratic in year  $t$ . We set  $\delta = 0.98$ , which is the mid-point of the range found in (12), i.e. democratic capital depreciates at a rate of 2%. Period  $t_0$ , at which accumulation of democratic capital starts, is defined as the year 1946, or the earliest available date after 1946 (17). Finally, to quantify experiences with political regimes at the individual level, we analogously calculate individual-specific measures of democratic capital, i.e. for an individual  $i$  of age  $age_i$ , democratic capital is calculated as

$$\begin{aligned} democ\_cap_{ijt} &= democratic_{jt} + \delta democ\_cap_{ijt-1} \\ &= \sum_{\tau=\max(t_0, t-age_i)}^t \delta^{t-\tau} democratic_{j\tau} \end{aligned} \quad (2)$$

## Econometric Specification, Identification, and Results

Our main specification is as follows:

$$\begin{aligned} support\ for\ democracy_{ijt} &= \alpha_0 + \alpha_1 democ\_cap_{ijt} + \alpha_2' X_{ijt} + \\ &\quad + country\text{-}year\ dummies_{jt} + \varepsilon_{ijt} \end{aligned} \quad (3)$$

where  $X_{ijt}$  is a vector of individual characteristics (18). This specification recognizes that there are unobserved country-year specific variables that change over time, so that country-specific fixed effects alone cannot fully take care of possible reverse causality and/or omitted

variables. The country-year specific fixed effects will capture all country-level unobservables that are specific to a country in a given year, such as current democratic institutions, currently ruling parties, or current economic conditions. We are interested in  $\alpha_1$ , the effect of experience with democracy at the individual level. Variation in individual experience is plausibly exogenous, as it is driven by age differences. To separate the effect of experience with democracy from the effect of age, we exploit the variation across the large number of countries whose democratic histories differ substantially in both WVS and Afrobarometer. The underlying identifying assumption of our approach is that there are no unobserved factors at the country-year-age level which are correlated with the individual democratic capital stock and support for democracy. Under this assumption,  $\alpha_1$  cleanly identifies the effect of the individual experience with democracy on the support for democracy. “Living under a democracy” is the basic treatment, and the individual’s democratic capital, i.e. the “length of experience with democracy”, can be interpreted as the treatment intensity. A positive estimate for  $\alpha_1$  arises if the relationship between age and support for democracy is more positive in long-standing democracies than in newly formed democracies, since in the former case older individuals have accumulated a larger democratic capital stock than younger ones, while in the latter case democratic capital does not vary by age (Figure S1). For the same reason, a positive estimate for  $\alpha_1$  arises if the relationship between age and support for democracy is more positive in newly formed autocracies than in long-standing autocracies.

Table 1 shows the main results. The first five columns report results based on WVS. Here, the dependent variables are ordinal, and we use the ordered probit estimator. In column 6 the dependent variable is a binary index and we estimate a probit model. All standard errors are corrected for correlation within country-year observations.

Columns 1 to 3 use the IW-index as the dependent variable. As a reference point, column 1 includes country and year fixed effects separately, which allows us to include a dummy for the country’s current democratic status ( $democratic_{jt}$ ) and the country-level measure of democratic capital ( $democ\_cap_{jt}$ ). Column 2 adds individual-level democratic capital ( $democ\_cap_{ijt}$ ). All three variables are positively correlated with stated support for democracy. However, as noted above, the country-level variables are likely endogenous. Therefore, our main specification in column 3 includes country-year fixed effects. Since this way we can control for country-year specific unobservables, and under the above stated identifying assumption, we can interpret a significant coefficient on an individual’s democratic capital as the causal effect that an individual’s experience with democracy has on her support for democracy. We find a statistically highly significant positive coefficient on the democratic capital that an individual has accumulated, indicating that individual experience with democ-

racy positively affects support for democracy. Columns 4 and 5 use as dependent variables the two individual components from the IW-index that measure prodemocratic attitudes (results using the two individual components that measure antidemocratic attitudes are shown in table S5). Unlike the other questions constituting the IW-index, Question E117, used in column 4, is available also in the latest wave of the WVS (2010-2014), and thus leads to a much larger number of observations. The results confirm the main finding. Column 6 focuses on Africa, using Afrobarometer data. We continue to find that a higher individual-level democratic capital stock increases support for democracy.

The Supplementary Online Materials present results of several robustness checks in tables S3 to S5. We confirm that our main results are robust to the following: (i) adding more individual-level controls, (ii) omitting the potentially endogenous controls for education, (iii) different assumptions about the error structure in the regression model, (iv) controlling for a full set of age dummies, (v) controlling for interactions between age and country fixed effects and age and year fixed effects, (vi) alternative ways to use the Polity 2 index to build the democratic capital stock, (vii) using alternative depreciation parameters to calculate democratic capital, (viii) restricting the sample to current democracies, current autocracies, or countries that never experienced a regime switch, and (ix) using the two remaining subcomponents of the IW-index, which measure autocratic preferences, separately. (x) Finally, in Table S6 we show that our results are robust to using the Freedom House index (see e.g. 19) as an alternative way of identifying democratic periods.

In sum, across data sets and across a large number of specifications, we find a statistically highly significant positive impact of individual experience with democracy on support for democracy. How big is the effect? To get some idea about this, rather than using ordered probit estimates, it is more transparent to use OLS estimates, which are reported in the Supplementary Online Materials (Table S3, column 3) for the main specification, based on the WVS. The OLS estimate for the coefficient on individual democratic capital is 0.04. Thus, to move an individual one step up in the IW-index in a more pro-democratic direction would take 25 additional democratic capital units (e.g. around 35 years of continuously living under democracy). Alternatively, one can compare the coefficient on individual democratic capital to the education coefficients. For example, the difference between primary and secondary education is about 0.32 in the OLS estimates. This implies that – for an individual to achieve the same increase in support for democracy as switching from primary to secondary education – individual democratic capital needs to go up by around 8 units (for example roughly 8.5 years of continuously living under democracy).

## Conclusion

Using individual-level data from 104 countries, we find evidence for the hypothesis that political preferences are shaped by the political system. Based on individual-level variation, our approach rules out potential effects of unobserved variables at the country-year level, such as the political environment or economic conditions. Of course, there are other variables than experience with the political system that affect support for democracy, many of which have been analyzed in the political science literature (e.g. 20). Yet, the endogeneity of preferences to the actual political system is by itself a very important phenomenon from both a policy and a theoretical point of view. For public policy, it means that implementing major political reforms might be a difficult task, while on the other hand individuals will increase their support for new systems over time. For the countries involved in the fresh waves of democratization movements in the Arab Spring, this gives some hope that broad support for democracy will increase over time, albeit slowly, making the new regimes more sustainable. For theoretical work, endogenous preferences pose challenges for both welfare theory and political economy.

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17. A small number of deviating cases, because of data constraints, are described in the Supplementary Online Materials. Note that, since we include country or even country-year fixed effects in all specifications and thus identify the coefficients only through changes within a country (or a country-year), the choice of the start year is in fact innocuous.
18. We follow standard specifications in the literature and include some basic demographic characteristics of the respondents as controls, namely variables related to age, gender, and education. Since our focus lies on establishing a causal relationship, we omit likely endogenous attitudinal variables, as e.g. analyzed in (20).
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Data used in the analysis are described in the Supplementary Materials. All data used for this study can be downloaded from publicly available websites. World Values Survey data are available from <[www.worldvaluessurvey.org](http://www.worldvaluessurvey.org)>, Afrobarometer data from <[www.afrobarometer.org](http://www.afrobarometer.org)>, Polity IV data from <<http://www.systemicpeace.org/polity/polity4.htm>>, and Freedom House data from <<http://www.freedomhouse.org>>. Statistical programs to replicate the analysis are archived in Dataverse (doi: 10.7910/DVN/29151).

support for democracy based on	World Values Survey					Afrobarometer
	IW (2003) (1)	IW (2003) (2)	IW (2003) (3)	Question E117 (4)	Question E123 (5)	Bratton (2004) (6)
country democratic at time of survey	0.339** (0.141)	0.335** (0.142)				
country's democratic capital	0.063** (0.030)	0.040 (0.030)				
individual's democratic capital		0.021*** (0.005)	0.021*** (0.005)	0.018*** (0.003)	0.021*** (0.004)	0.021*** (0.006)
age 11-20	-0.162*** (0.044)	-0.066* (0.036)	-0.053 (0.035)	-0.057** (0.024)	-0.080** (0.040)	-0.095*** (0.029)
age 21-30	-0.101*** (0.039)	-0.023 (0.032)	-0.011 (0.032)	-0.090*** (0.020)	-0.063* (0.035)	-0.044* (0.024)
age 31-40	-0.041 (0.031)	0.007 (0.026)	0.014 (0.026)	-0.069*** (0.017)	-0.047 (0.030)	0.049** (0.022)
age 41-50	0.001 (0.025)	0.023 (0.023)	0.031 (0.023)	-0.039*** (0.015)	-0.022 (0.027)	0.078*** (0.021)
age 51-60	0.038** (0.019)	0.048*** (0.018)	0.051*** (0.018)	-0.026** (0.012)	-0.001 (0.021)	0.089*** (0.020)
male	0.049*** (0.011)	0.050*** (0.011)	0.050*** (0.011)	0.063*** (0.008)	0.042*** (0.012)	0.194*** (0.015)
primary education	0.073** (0.033)	0.067** (0.033)	0.067** (0.034)	0.029* (0.017)	0.011 (0.031)	0.215*** (0.022)
secondary education	0.250*** (0.043)	0.244*** (0.043)	0.233*** (0.043)	0.162*** (0.022)	0.098** (0.042)	0.448*** (0.036)
post secondary educ.	0.529*** (0.053)	0.523*** (0.052)	0.518*** (0.051)	0.374*** (0.029)	0.275*** (0.051)	0.562*** (0.045)
country FE	yes	yes				
year FE	yes	yes				
country-year FE			yes	yes	yes	yes
observations	82990	82990	82990	228901	92565	149035
number of countries	56	56	56	79	57	31
survey waves (WVS) / rounds (AB)	3-5	3-5	3-5	3-6	3-5	1-5
years covered	1994-2006	1994-2006	1994-2006	1994-2013	1994-2006	1999-2013

Notes: Robust standard errors in parentheses clustered at the country-year level;

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%;

omitted age category is older than 60 years; omitted education category is no education;

columns 1 to 5 show coefficients from ordered probit estimations, column 6 from a probit estimation.

Table 1: Determinants of Support for Democracy

## Supplementary Materials

### Details of the Data Preparation

**World Values Surveys and Polity 2 Index** Our starting point is the survey data from the World Values Survey (WVS) available at <http://www.worldvaluessurvey.org/wvs.jsp>. We match the democratic status, based on the Polity 2 index from the Polity IV data set (<http://www.systemicpeace.org/polity/polity4.htm>), to the country-year pairs contained in the WVS. In addition, we use Polity 2 indices going back to 1946 or the earliest available date for each country to calculate the democratic capital stock. However, the Polity IV dataset does not contain complete information for all WVS-countries and/or for all years. We dealt with missing data after the earliest available date as follows:

(1) We drop all WVS data from the following countries:

- Bosnia (which has only 3 years of valid Polity 2 data, 1992-1994)
- Germany (East and West Germans went through very different systems, and it is not possible to identify them separately in the WVS)
- Iraq (no Polity 2 data for 2003-2009)
- Lebanon (no Polity 2 data for 1990-2004)
- Tunisia (no Polity 2 data for 2011-13)

(2) Further, in four country-year pairs, the Polity 2 index is not defined, while data for years before and after exist. To avoid dropping the whole country because of one missing country-year observation, we impute the index in those cases using the mean of the years before and after. For the following country-years the Polity 2 index data are imputed:

- Egypt 2012, imputed as -3 (based on the existing data for 2011=-2 and 2013=-4)
- Hungary 1956, imputed as -7 (based on 1955=-7, 1957=-7)
- Kuwait 1990, imputed as -9.5 (based on 1989=-10, 1991=-9)
- Uganda 1979, imputed as -2 (based on 1978=-7, 1980=3)

Since we use country fixed effects in all specifications, constant differences between countries that are due to these measurement issues at the country-level are controlled for. In addition, for Hungary, Kuwait, and Uganda the imputed data point is far enough in the past that, due to depreciation, this does not affect measurement in a significant way.

(3) For Singapore, we have missing data in consecutive years some time ago, namely 1963-64. As a consequence, democratic capital is calculated starting only in 1965. Again this is relatively far in the past so that, due to depreciation, this does not affect measurement in a significant way. Also, recall that country fixed effects are used.

**World Values Surveys and Inglehart and Welzel Index** The WVS data allow us to generate various dependent variables to measure an individual's "support for democracy". In our baseline specification, we follow Inglehart and Welzel (14, p. 79), who advocate an index based on four different questions from WVS. This index is also used, for example, by (21). Each of the four questions is coded between 0 and 3. Two of the four questions measure pro-democratic attitudes, while the two other questions focus on pro-autocratic attitudes. More specifically, the questions are

(1) E117 (pro-democratic), Question text:

"I'm going to describe various types of political systems and ask what you think about each as a way of governing this country. For each one, would you say it is a very good, fairly good, fairly bad or very bad way of governing this country?

Having a democratic political system"

(2) E123 (pro-democratic), Question text:

"I'm going to read off some things that people sometimes say about a democratic political system. Could you please tell me if you agree strongly, agree, disagree or disagree strongly, after I read each one of them?

Democracy may have problems but it's better than any other form of government"

(3) E114 (pro-autocratic), Question text:

"I'm going to describe various types of political systems and ask what you think about each as a way of governing this country. For each one, would you say it is a very good, fairly good, fairly bad or very bad way of governing this country?

Having a strong leader who does not have to bother with parliament and elections"

(4) E116 (pro-autocratic), Question text:

“I’m going to describe various types of political systems and ask what you think about each as a way of governing this country. For each one, would you say it is a very good, fairly good, fairly bad or very bad way of governing this country?”

Having the army rule”

Using the answers to these four questions, we construct for each individual two subindices “pro-democracy” and “pro-autocracy” (each between 0 and 6), by adding up the values given as responses to the two pro-democracy related questions and similarly adding up the two pro-autocracy related questions. In a final step, we subtract the “pro-autocracy” subindex from the “pro-democracy” subindex, which results in the IW-index, which runs between -6 and +6.

To show robustness, we also show results that are based purely on the four individual components of the IW-index (tables 1, S5, and S6).

**Afrobarometer and Polity 2 Index** Afrobarometer data are available at

<http://www.afrobarometer.org/>. Of the issues that emerge with WVS data because of missing Polity 2 data, the following issues also apply to our work with Afrobarometer survey data:

- (1) We drop all Afrobarometer data from Tunisia (missing Polity 2 data for 2011-13).
- (2) As before, for the following country/years the Polity 2 index data is imputed: Egypt 2012 (imputed as -3, based on the existing data for 2011=-2 and 2013=-4); Uganda 1979 (imputed as -2, based on existing data for 1978=-7, 1980=3).

**Freedom House Index** In the robustness checks, we also use data from Freedom House (<http://www.freedomhouse.org/>). Since Freedom House data are only available from 1971 onwards, for calculation of the democratic capital stock the starting year is 1971. Further, the following issues emerge when we use the Freedom House data:

- (1) In 1982, there was a change in the reference period for the Freedom House index. As a consequence, there is no value for 1982, while the index value for 1981 refers to the period January 1981-August 1982. Because the index for 1981 covers two-thirds of 1982, we impute the value for 1982 by taking the index value from 1981.
- (2) For the match with Afrobarometer data, we additionally have to deal with the fact that Freedom House status is not available for Namibia, Cape Verde and Mozambique for certain early years. For Cape Verde and Mozambique data for 1972 to 1974 is missing. For

Namibia, 1975-1988 are missing. For these reasons, democratic capital for these countries is calculated starting in a later year (1975 for Cape Verde and Mozambique, 1989 for Namibia).

## **WVS Data: Countries Included and Summary Statistics**

The sample of countries varies and is contingent on the dependent variable used. Further, the Polity IV and Freedom House data sets cover different countries, resulting in slightly different samples when Freedom House is used. The baseline specifications are based on the IW-index and the Polity 2 variable from the Polity IV data set. Table S1 indicates the full list of countries for which WVS and either Polity IV or Freedom House data are available. Column 1 indicates the countries that provide data for the baseline regressions, and the following columns indicate for which WVS waves data are available.

Columns 6 to 9 provide summary information about the democracy measures used. To allow for a meaningful comparison of the individual-level data for democratic capital, individual-level democratic capital is shown for 2013 using the example of a 40-year old person. 27.7 is the maximum democratic capital stock for a 40-year old person, corresponding to continuously living under democracy for 40 years. This is the case because the democratic capital stock depreciates 2 percent every year (i.e.  $\delta = 0.98$ ). Without depreciation of the democratic capital stock, the maximum value of democratic capital of a 40 year-old would be 40. The last two columns state the mean of the support-for-democracy variable for the last survey wave that is available for a country. Recall that in the main specification country-year fixed effects are used, therefore only variation within a country-year identify our parameter of interest.

Figure S1 provides a further illustration how the individual democratic capital stock varies by age depending on the democratic history of a country. It shows the democratic capital stock by age in 2013 for three current democracies, namely the US, Spain, and Croatia, in the upper panel, and three current autocracies, namely China, Nigeria, and Venezuela, in the lower panel, always calculated based on Polity IV data. A solid line indicates a long-standing democracy/autocracy, a dashed line a country that turned democratic/autocratic some time ago, and a dotted line a young democracy/autocracy. In the long-standing democracy US, the individual democratic capital stock is strictly increasing by age. In the young democracy Croatia instead, which only turned democratic in 2000, the individual democratic capital stock does not vary by age, but is 12.3 for everyone, as each individual aged 15 and above has the same experience with democracy. Spain has been democratic since 1978. Thus, young individuals in Spain have the same democratic capital stock as young individuals in the US,

but older individuals have less democratic capital than older individuals in the US, since they experienced autocracy when they were young. For current autocracies, the picture is reversed. All individuals in China, which is a long-standing autocracy, have an individual democratic capital stock of zero. In the relatively new autocracy Venezuela, which was democratic from 1958 to 2005, on the other hand, the individual democratic capital stock is increasing in age, but is for each age at a lower level than in the US due to the recent experience of autocracy. Nigeria has been democratic from 1960 to 1963, and then again from 1979 to 1983, and thus features a zero democratic capital stock for young individuals, but a positive one for older individuals.

## **Afrobarometer Data: Countries Included and Summary Statistics**

Table S2 shows a summary of data availability and democracy measures, as well as the mean measures of support for democracy, for the countries in the Afrobarometer sample.

## **Robustness Checks using World Values Surveys**

Here, we report the results of several robustness checks (robustness checks (i) - (x)) that we refer to in the main text. All results are robust to the changes discussed here.

In column 1 of Table S3, we add to the baseline regression of column 3 of Table 1 a set of dummies that capture marital status, number of children, employment status, and (subjective) social class. In column 2, we omit the potentially endogenous controls for education. In column 3, we show OLS estimates (instead of ordered probit estimates that are reported otherwise). Column 4 then makes different assumptions about the error structure in our regression model. In particular, we allow for two-dimensional clustering in both the time and country dimension (22). The standard errors should be compared to those in column 3. In column 5, we control for a full set of age dummies, thus allowing for an arbitrary relationship between age and support for democracy. This way we rule out the possibility that a mechanical positive non-linear relationship between age and the individual experience with democracy is driving our results. In column 6, we add as additional controls interactions between the six age group dummies (age 11-20, 21-30, 31-40, 41-50, 51-60, 61+) and country fixed effects, as well as the six age group dummies and year fixed effects. Our main specification in essence relies on a triple-interaction between country, year, and age. By including, in addition to the usual country-year fixed effects, interactions between age and country fixed effects, and age and year fixed effects, we include all relevant two-way interactions as well.

In column 1 of Table S4, we define a country/year observation as a democracy if the Polity 2 index is strictly positive, following (12). We then rebuild the measure of the democratic

capital stock, using as always the depreciation rate  $\delta = 0.98$ . This new definition changes the size of the accumulated stock of democratic capital in the data, which implies that magnitudes of the coefficients in this table cannot be compared directly, but only the direction and significance of the effect. Column 2 builds the measure of the democratic capital stock not relying on the dichotomy of being democratic or not in a given year, but using the full Polity 2 index of -10 to 10 in each year. Columns 3 to 5 show the robustness of the results to using different depreciation rates in building the democratic capital stock, where we otherwise rely on our benchmark way to build the democratic capital stock. Here, again, the magnitudes of the democratic capital stock change across specifications, and consequently the magnitudes of the coefficients cannot be compared, but only their signs.

In columns 1 to 3 of Table S5, we restrict the sample first to countries that are democratic in the sample year, then to countries that are autocratic in the sample year, and last to countries that never switched the political regime between 1945 and 2013, i.e. long-standing autocracies and democracies. The coefficient on individual democratic capital is fairly constant across the sample splits, indicating that the effect of individual democratic capital on support for democracy is fairly homogenous across countries with different current and historical political status. However, the standard error is much larger in the sample of current autocratic countries, possibly due to the limited variation in the democratic capital stock, which is zero for all individuals in long-standing autocracies and has limited variation in countries that were democratic only in the recent past. Finally, columns 4 and 5 of Table S5 use as dependent variables the answers to the remaining two pro-autocracy questions which together with the two pro-democracy questions used in columns 4 and 5 of Table 1 form the IW-index. Both question E114 and question E116 from WVS relate to preferences for autocracy, and we thus expect that, unlike in the other specifications, the coefficients on individual's democratic capital are negative.

## **Robustness Checks Using the Freedom House Index**

The Freedom House index (19) constitutes an alternative way of identifying democratic periods. Here, we report results of the robustness checks that identify democracies based on the Freedom House index. The Freedom House Index is provided by the Freedom in the World project and evaluates political rights as well as civil liberties for the majority of countries in the world, starting in 1971. Based on these, the index categorizes country-year pairs into the three groups of free, partly free, and not free. When using the Freedom House index, we characterize “free” countries as democratic. The distinction in free vs. partly free/not free countries coincides with the distinction of democratic vs. hybrid/autocratic

regimes (23), and is also supported by (24). The categorizations into partly free/not free and hybrid/autocratic have less overlap.

One important difference between the two indices is the time-series coverage: The Freedom House index is available starting from 1971, while Polity 2 is available for a much longer period. Therefore, even if both datasets would code countries in exactly the same way, the democratic capital stock based on Freedom House will be smaller than the democratic capital stock based on Polity 2. Further, there are slight differences in availability of Polity 2 and Freedom House indices, such that the samples of countries and years are not exactly the same across specifications.

Table S6 shows the results, replicating all specifications of Table 1 with the Freedom House index. The results are qualitatively very similar (recall that the magnitudes of the democratic capital stock coefficients cannot be compared directly between Tables 1 and S6). The only qualitative difference is that the country-level democratic capital stock remains statistically significant when the individual-level democratic capital stock is introduced (column 2).

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17. A small number of deviating cases, because of data constraints, are described in the Supplementary Online Materials. Note that, since we include country or even country-year fixed effects in all specifications and thus identify the coefficients only through changes within a country (or a country-year), the choice of the start year is in fact innocuous.
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country	used in baseline regression	Data available for ...				Democracy measure: Polity 2		Democracy measure: Freedom House		mean support for democracy	
		Wave 3 (1994-1998)	Wave 4 (1999-2004)	Wave 5 (2005-2009)	Wave 6 (2010-2013)	democratic in 2013	democratic capital of 40-year-old in 2013	democratic in 2013	democratic capital of 40-year-old in 2013	IW index in last available survey; range [-6;6]	"Question E117" in last available survey; range [0;3]
Albania	1	1	1	0	0	1	10.8	0	0.0	3.9	2.8
Algeria	1	0	1	0	1	0	0.0	0	0.0	2.8	2.5
Andorra		0	0	1	0			1	17.3		2.5
Argentina	1	1	1	1	0	1	24.2	1	21.1	3.3	2.5
Armenia	1	1	0	0	1	0	2.6	0	0.0	1.7	2.5
Australia	1	1	0	1	1	1	27.7	1	27.7	3.4	2.5
Azerbaijan	1	1	0	0	1	0	0.0	0	0.0	3.4	2.4
Bangladesh	1	1	1	0	0	0	12.0	0	1.3	4.8	2.7
Belarus	1	1	0	0	1	0	2.6	0	0.0	1.9	2.2
Brazil	1	1	0	1	0	1	22.2	1	15.6	1.4	2.2
Bulgaria	1	1	0	1	0	1	19.2	1	18.6	2.1	2.2
Burkina Faso		0	0	1	0	0	0.0	0	1.0		2.7
Canada	1	0	1	1	0	1	27.7	1	27.7	3.5	2.4
Chile	1	1	1	1	1	1	19.8	1	19.2	2.3	2.5
China	1	0	1	1	1	0	0.0	0	0.0	1.7	2.3
Colombia		1	0	1	1	1	27.7	0	7.9		2.2
Cyprus		0	0	1	1	1	27.7	1	24.3		2.7
Czech Rep.	1	1	0	0	0	1	17.3	1	19.2	3.6	2.3
Dominican Rep.		1	0	0	0			1	22.4	3.9	2.6
Ecuador		0	0	0	1	0	18.8	0	11.6		2.4
Egypt		0	1	1	1	0	0.0	0	0.0		2.8
El Salvador		0	1	0	0	1	22.7	1	15.5		2.1
Estonia	1	1	0	0	1	1	18.6	1	17.9	3.1	2.3
Ethiopia		0	0	1	0	0	0.0	0	0.0		2.7
Finland	1	1	0	1	0	1	27.7	1	27.7	2.8	2.3
France		0	0	1	0	1	27.7	1	27.7		2.4
Georgia	1	1	0	1	0	1	9.1	0	0.0	2.0	2.6
Ghana		0	0	1	1	1	12.6	1	12.8		2.8
Great Britain		0	0	1	0	1	27.7	1	27.7		2.4
Guatemala	1	0	0	1	0	1	15.2	0	0.0	1.6	2.1
Hungary	1	1	0	0	0	1	19.2	1	19.2	3.8	2.4
India	1	1	1	1	0	1	27.7	1	22.0	2.2	2.4
Indonesia	1	0	1	1	0	1	13.1	0	7.3	0.9	2.5
Iran	1	0	1	1	0	0	0.0	0	0.0	0.7	2.3
Iraq		0	1	1	1			0	0.0	3.3	2.5
Italy		0	0	1	0	1	27.7	1	27.7		2.6
Japan	1	0	1	1	1	1	27.7	1	27.7	3.5	2.3
Jordan	1	0	1	1	0	0	0.0	0	0.0	1.8	2.7
Kazakhstan		0	0	0	1	0	0.0	0	0.0		2.3
Kyrgyzstan	1	0	1	0	1	1	2.9	0	0.0	1.2	2.0

Table S1: Countries Included in the Empirical Work Based on the World Values Surveys

Latvia	1	1	0	0	0	1	18.6	1	17.3	2.3	2.1
Lebanon		0	0	0	1			0	0.5		2.2
Lithuania	1	1	0	0	0	1	18.6	1	18.6	2.0	2.1
Macedonia	1	1	1	0	0	1	18.6	0	0.0	2.0	2.4
Malaysia		0	0	1	1	1	5.7	0	0.0		2.4
Mali		0	0	1	0	0	16.0	0	15.3		2.4
Mexico	1	1	1	0	1	1	14.5	0	8.4	1.5	2.1
Moldova	1	1	1	1	0	1	17.3	0	0.0	1.7	2.3
Morocco	1	0	1	1	1	0	0.0	0	0.0	4.5	2.8
Netherlands		0	0	1	1	1	27.7	1	27.7		2.3
New Zealand	1	1	1	0	1	1	27.7	1	27.7	4.1	2.5
Nigeria	1	1	1	0	1	0	2.6	0	2.6	3.1	2.7
Norway	1	1	0	1	0	1	27.7	1	27.7	4.4	2.7
Pakistan	1	1	1	0	1			0	0.0	2.9	2.4
Peru	1	1	1	1	1	1	18.5	1	16.6	2.8	2.4
Philippines	1	1	1	0	1	1	21.0	0	8.7	0.9	2.1
Poland		0	0	1	1	1	18.6	1	19.2		2.1
Romania	1	1	0	1	1	1	15.2	1	15.2	3.0	2.6
Russia	1	1	0	1	1	0	5.7	0	0.0	0.9	2.0
Rwanda		0	0	0	1	0	0.0	0	0.0		2.5
Serbia		0	0	1	0	1	2.0				2.1
Singapore		0	1	0	1	0	0.0	0	0.0		2.2
Slovakia	1	1	0	0	0	1	17.3	1	17.1	3.5	2.4
Slovenia	1	1	0	1	1	1	18.6	1	18.6	3.2	2.3
South Africa	1	1	1	1	0	1	17.9	1	16.6	2.9	2.4
South Korea	1	1	1	1	1	1	20.4	1	20.4	3.1	2.3
Spain	1	1	1	1	1	1	25.8	1	26.3	3.4	2.6
Sweden	1	1	1	1	1	1	27.7	1	27.7	4.1	2.7
Switzerland	1	1	0	1	0	1	27.7	1	27.7	3.5	2.6
Taiwan	1	1	0	1	1	1	17.9	1	15.2	1.9	2.3
Tanzania	1	0	1	0	0	0	0.0	0	0.0	4.4	2.7
Thailand		0	0	1	0	1	13.4	0	7.2		2.4
Trinidad and Tobago		0	0	1	1	1	27.7	1	24.5		2.5
Tunisia		0	0	0	1			0	0.0		2.5
Turkey	1	1	1	1	1	1	26.1	0	2.9	2.7	2.5
Uganda	1	0	1	0	0	0	0.0	0	0.0	2.9	2.4
Ukraine	1	1	0	1	1	1	17.9	0	4.4	1.7	2.2
United States	1	1	1	1	1	1	27.7	1	27.7	3.8	2.4
Uruguay	1	1	0	1	1	1	22.2	1	22.2	3.1	2.4
Uzbekistan		0	0	0	1	0	0.0	0	0.0		2.7
Venezuela	1	1	1	0	0	0	20.3	0	11.9	2.9	2.6
Viet Nam	1	0	1	1	0	0	0.0	0	0.0	-1.2	2.5
Zambia		0	0	1	0	1	9.0	0	1.3		2.6
Zimbabwe	1	0	1	0	1	0	0.0	0	0.0	3.0	2.7

Table S1: Countries Included in the Empirical Work Based on the World Values Surveys (Continued)

country	used in baseline regression	Data available for ...					Democracy measure: Polity 2		Democracy measure: Freedom House		mean support for democracy
		Round 1 (1999- 2001)	Round 2 (2002- 2004)	Round 3 (2005- 2007)	Round 4 (2008- 2009)	Round 5 (2010- 2013)	democratic in 2013	democratic capital of 40-year-old in 2013	democratic in 2013	democratic capital of 40-year-old in 2013	mean Bratton index in last available survey; range [0,1]
Algeria	1	0	0	0	0	1	0	0.0	0	0.0	0.52
Benin	1	0	0	1	1	1	1	18.6	1	18.6	0.76
Botswana	1	1	1	1	1	1	1	27.7	1	27.7	0.82
Burkina Faso	1	0	0	0	1	1	0	0.0	0	1.0	0.73
Burundi	1	0	0	0	0	1	1	8.3	0	0.0	0.74
Cameroon	1	0	0	0	0	1	0	0.0	0	0.0	0.65
Cape Verde	1	0	1	1	1	1	1	18.6	1	18.6	0.81
Cote d'Ivoire	1	0	0	0	0	1	0	0.0	0	0.0	0.82
Ghana	1	1	1	1	1	1	1	12.6	1	12.8	0.81
Guinea	1	0	0	0	0	1	0	0.0	0	0.0	0.78
Kenya	1	0	1	1	1	1	1	10.8	0	0.0	0.74
Lesotho	1	1	1	1	1	1	1	15.0	1	7.9	0.55
Liberia	1	0	0	0	1	1	1	7.5	0	0.0	0.82
Madagascar	1	0	0	1	1	1	0	13.1	0	0.0	0.39
Malawi	1	1	1	1	1	1	1	14.2	0	3.5	0.77
Mali	1	1	1	1	1	1	0	16.0	0	15.3	0.62
Mauritius	1	0	0	0	0	1	1	27.7	1	26.2	0.85
Morocco	1	0	0	0	0	1	0	0.0	0	0.0	0.63
Mozambique	1	0	1	1	1	1	0	0.0	0	0.0	0.64
Namibia	1	1	1	1	1	1	1	19.2	1	19.2	0.64
Niger	1	0	0	0	0	1	1	10.0	0	0.0	0.66
Nigeria	1	1	1	1	1	1	0	2.6	0	2.6	0.69
Senegal	1	0	1	1	1	1	1	12.3	1	7.0	0.88
Sierra Leone	1	0	0	0	0	1	1	6.6	0	1.0	0.76
South Africa	1	1	1	1	1	1	1	17.9	1	16.6	0.72
Swaziland	1	0	0	0	0	1	0	0.0	0	0.0	0.46
Tanzania	1	1	1	1	1	1	0	0.0	0	0.0	0.85
Togo	1	0	0	0	0	1	0	0.0	0	0.0	0.77
Uganda	1	1	1	1	1	1	0	0.0	0	0.0	0.80
Zambia	1	1	1	1	1	1	1	9.0	0	1.3	0.90
Zimbabwe	1	1	1	1	1	1	0	0.0	0	0.0	0.79

Table S2: Countries Included in the Empirical Work Based on the Afrobarometer Surveys

support for democracy based on	IW (2003)	IW (2003)	IW (2003)	IW (2003)	IW (2003)	IW (2003)
type of variation in specification	more controls	fewer controls	OLS	OLS cluster 2-dimens.	full set of age dummies	control for other two-way interactions age and FEs
	(1)	(2)	(3)	(4)	(5)	(6)
individual's democratic capital	0.022*** (0.005)	0.021*** (0.005)	0.039*** (0.009)	0.039*** (0.010)	0.020*** (0.005)	0.027*** (0.006)
age 11-20	-0.146*** (0.034)	0.043 (0.032)	-0.092 (0.069)	-0.092 (0.085)		
age 21-30	-0.080*** (0.030)	0.112*** (0.027)	-0.011 (0.062)	-0.011 (0.080)		
age 31-40	-0.036 (0.025)	0.111*** (0.025)	0.042 (0.050)	0.042 (0.065)		
age 41-50	-0.014 (0.024)	0.110*** (0.022)	0.069 (0.044)	0.069 (0.053)		
age 51-60	0.028 (0.018)	0.091*** (0.018)	0.100*** (0.034)	0.100** (0.044)		
male	0.031** (0.013)	0.066*** (0.011)	0.091*** (0.021)	0.091*** (0.016)	0.050*** (0.011)	0.050*** (0.011)
primary education	0.057* (0.032)		0.129** (0.065)	0.129* (0.077)	0.069** (0.034)	0.076** (0.036)
sec. education	0.220*** (0.039)		0.445*** (0.082)	0.445*** (0.118)	0.234*** (0.043)	0.242*** (0.045)
post sec. educ.	0.495*** (0.046)		0.984*** (0.096)	0.984*** (0.145)	0.518*** (0.052)	0.530*** (0.053)
additional controls (see notes)	yes					
full set of age dummies					yes	
(age groups)*(country FE)						yes
(age groups)*(year FE)						yes
country-year FE	yes	yes	yes	yes	yes	yes
observations	74552	85317	82990	82990	82990	82990
number of countries	54	56	56	56	56	56
survey waves	3-5	3-5	3-5	3-5	3-5	3-5
years covered	1994-2006	1994-2006	1994-2006	1994-2006	1994-2006	1994-2006

Notes: Robust standard errors in parentheses clustered at the country-year level, except for column 4;

in column 4 standard errors are clustered two-dimensionally at the country and the year level;

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%;

additional controls in column 1: marital status, number of children, employment status, (subjective) social class; omitted age category is older than 60 years; omitted education category is no education.

Table S3: General Robustness Checks

support for democracy based on	IW (2003)	IW(2013)	IW (2003)	IW (2003)	IW (2003)
type of variation in specification	Persson/Tabellini definition of democracy	democ. cap. based on scores [-10,10]	$\delta=0.9$	$\delta=0.95$	$\delta=1$
	(1)	(2)	(3)	(4)	(5)
individual's democratic capital	0.016*** (0.005)	0.001*** (0.000)	0.263*** (0.065)	0.058*** (0.014)	0.010*** (0.002)
age 11-20	-0.040 (0.037)	-0.132*** (0.038)	-0.056 (0.036)	-0.052 (0.036)	-0.055 (0.035)
age 21-30	-0.003 (0.032)	-0.070** (0.034)	-0.036 (0.033)	-0.019 (0.032)	-0.009 (0.032)
age 31-40	0.019 (0.027)	-0.015 (0.027)	-0.013 (0.028)	0.003 (0.026)	0.021 (0.026)
age 41-50	0.029 (0.023)	0.018 (0.023)	0.017 (0.024)	0.024 (0.023)	0.036 (0.023)
age 51-60	0.046** (0.018)	0.047*** (0.018)	0.046*** (0.018)	0.049*** (0.018)	0.053*** (0.017)
male	0.050*** (0.011)	0.051*** (0.011)	0.050*** (0.011)	0.050*** (0.011)	0.050*** (0.011)
primary education	0.073** (0.033)	0.066** (0.033)	0.071** (0.033)	0.068** (0.034)	0.066** (0.034)
sec. education	0.238*** (0.042)	0.231*** (0.042)	0.236*** (0.043)	0.234*** (0.043)	0.232*** (0.043)
post sec. educ.	0.522*** (0.052)	0.515*** (0.051)	0.519*** (0.052)	0.518*** (0.051)	0.517*** (0.051)
country-year FE	yes	yes	yes	yes	yes
observations	82990	82990	82990	82990	82990
number of countries	56	56	56	56	56
survey waves	3-5	3-5	3-5	3-5	3-5
years covered	1994-2006	1994-2006	1994-2006	1994-2006	1994-2006

Notes: Robust standard errors in parentheses clustered at the country-year level;

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%;

omitted age category is older than 60 years; omitted education category is no education.

Table S4: Robustness to Different Ways of Building the Democratic Capital Stock

support for democracy based on	IW (2003)	IW (2003)	IW (2003)	Question E114	Question E116
type of variation in specification	only current democracies	only current autocracies	only countries that never switch regime	pro- autocracy variable	pro- autocracy variable
	(1)	(2)	(3)	(4)	(5)
individual's democratic capital	0.022*** (0.005)	0.028 (0.025)	0.019** (0.008)	-0.012*** (0.002)	-0.013*** (0.002)
age 11-20	-0.068* (0.041)	-0.007 (0.069)	-0.164** (0.082)	-0.047** (0.021)	0.105*** (0.021)
age 21-30	-0.018 (0.036)	0.024 (0.065)	-0.119* (0.065)	-0.040** (0.018)	0.071*** (0.018)
age 31-40	-0.000 (0.027)	0.062 (0.061)	-0.068 (0.055)	-0.049*** (0.015)	0.011 (0.016)
age 41-50	0.014 (0.026)	0.088* (0.049)	-0.001 (0.045)	-0.055*** (0.013)	-0.020 (0.014)
age 51-60	0.037* (0.019)	0.099** (0.040)	0.043 (0.033)	-0.061*** (0.012)	-0.046*** (0.013)
male	0.043*** (0.013)	0.070*** (0.022)	0.098*** (0.030)	0.005 (0.007)	-0.045*** (0.010)
primary education	0.044 (0.043)	0.139*** (0.050)	0.027 (0.054)	0.002 (0.018)	-0.089*** (0.017)
sec. education	0.239*** (0.056)	0.218*** (0.066)	0.231*** (0.043)	-0.085*** (0.021)	-0.222*** (0.020)
post sec. educ.	0.550*** (0.065)	0.436*** (0.086)	0.567*** (0.079)	-0.268*** (0.026)	-0.456*** (0.023)
country-year FE	yes	yes	yes	yes	yes
observations	58667	24323	20521	216506	215348
number of countries	39	20	17	79	79
survey waves	3-5	3-4	3-4	3-6	3-6
years covered	1994-2006	1995-2003	1995-2004	1994-2013	1994-2013

Notes: Robust standard errors in parentheses clustered at the country-year level;  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%;  
omitted age category is older than 60 years; omitted education category is no education.

Table S5: Robustness to Different Samples and Individual WVS Questions

support for democracy based on	World Values Survey					Afrobarometer
	IW (2003) (1)	IW (2003) (2)	IW (2003) (3)	Question E117 (4)	Question E123 (5)	Bratton (2004) (6)
country democratic at time of survey	0.159* (0.086)	0.151* (0.091)				
country's democratic capital	0.089*** (0.015)	0.041* (0.022)				
individual's democratic capital		0.045*** (0.013)	0.053*** (0.011)	0.029*** (0.005)	0.042*** (0.012)	0.023*** (0.007)
age 11-20	-0.148*** (0.043)	-0.096*** (0.037)	-0.079** (0.037)	-0.087*** (0.024)	-0.117*** (0.041)	-0.105*** (0.028)
age 21-30	-0.087** (0.039)	-0.071** (0.036)	-0.061* (0.036)	-0.132*** (0.021)	-0.116*** (0.037)	-0.053** (0.024)
age 31-40	-0.027 (0.032)	-0.024 (0.031)	-0.020 (0.031)	-0.109*** (0.018)	-0.079** (0.033)	0.039* (0.023)
age 41-50	0.012 (0.026)	0.014 (0.025)	0.019 (0.025)	-0.062*** (0.015)	-0.035 (0.028)	0.074*** (0.021)
age 51-60	0.044** (0.019)	0.046** (0.019)	0.048** (0.019)	-0.036*** (0.012)	-0.003 (0.022)	0.088*** (0.019)
male	0.044*** (0.011)	0.045*** (0.011)	0.046*** (0.011)	0.060*** (0.008)	0.036*** (0.011)	0.193*** (0.015)
primary education	0.066** (0.031)	0.064** (0.031)	0.063** (0.030)	0.032** (0.016)	0.006 (0.029)	0.214*** (0.022)
secondary education	0.229*** (0.041)	0.227*** (0.041)	0.217*** (0.040)	0.158*** (0.021)	0.087** (0.039)	0.447*** (0.035)
post secondary educ.	0.500*** (0.051)	0.498*** (0.050)	0.491*** (0.050)	0.366*** (0.028)	0.254*** (0.049)	0.562*** (0.044)
country FE	yes	yes				
year FE	yes	yes				
country-year FE			yes	yes	yes	yes
observations	85381	85381	85381	235810	95248	151411
number of countries	57	57	57	82	58	33
survey waves (WVS) / rounds (AB)	3-5	3-5	3-5	3-6	3-5	1-5
years covered	1994-2006	1994-2006	1994-2006	1994-2013	1994-2006	1999-2013

Notes: Robust standard errors in parentheses clustered at the country-year level;  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%;  
omitted age category is older than 60 years; omitted education category is no education.

Table S6: Robustness Checks with Democratic Capital based on Freedom House Index

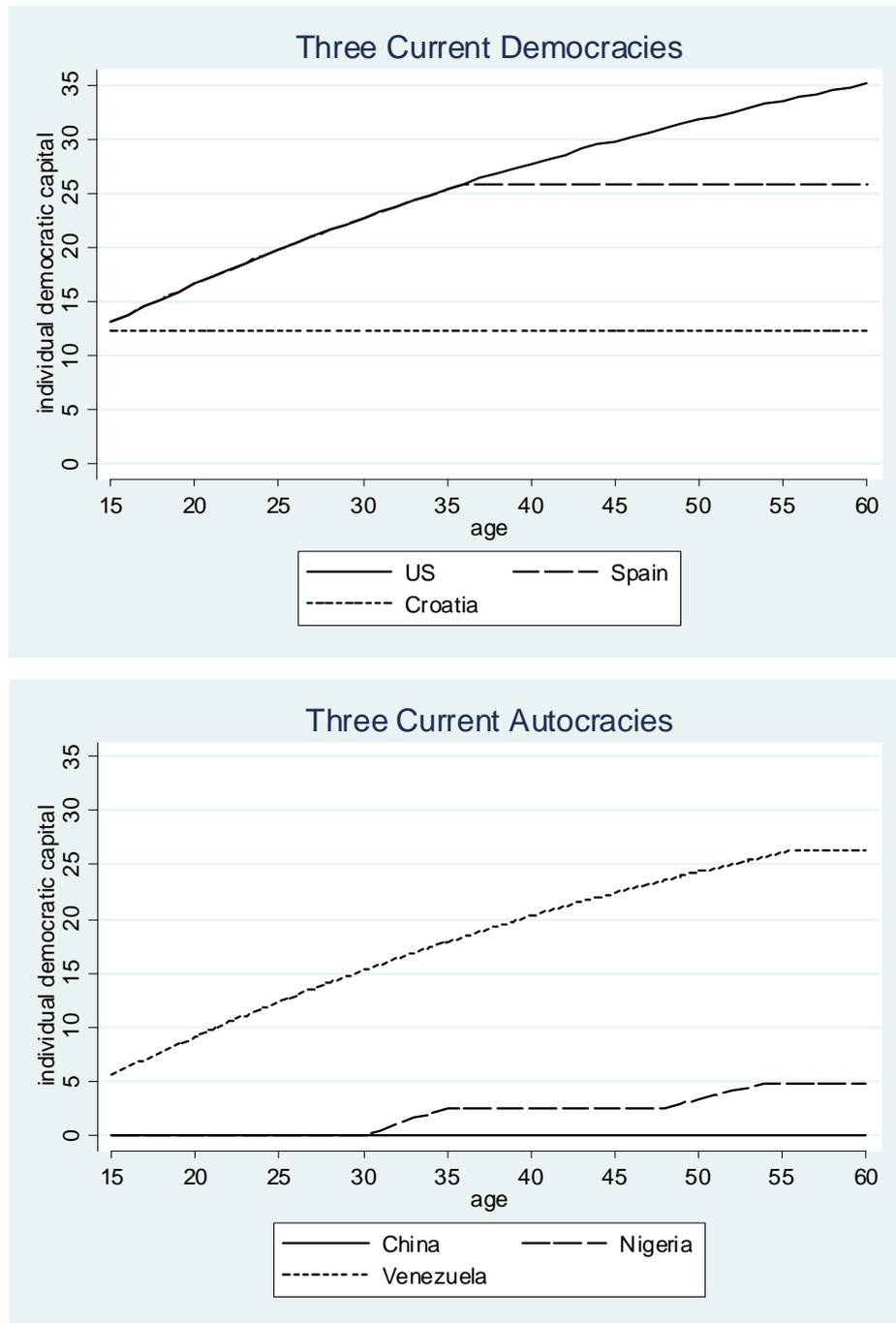


Figure S1: Individual Democratic Capital Stock by Age in 2013 for Some Sample Countries