

# Why Does Democracy Need Education?

by

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## **Abstract**

Across countries, education and democracy are highly correlated. We model a causal mechanism explaining this correlation, present some empirical support for this mechanism, and summarize some relevant historical evidence. In our model, schooling trains people to interact with others and raises the benefits of social participation, including voting and organizing. In the battle between democracy and dictatorship, democracy has a wide potential base of support but offers weak incentives to its defenders. Dictatorship provides stronger incentives to a narrower base. As education raises the benefits of civic engagement, it raises the support for more democratic regimes relative to dictatorships. This increases the likelihood of democratic revolutions against dictatorships, and reduces that of successful anti-democratic coups.

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## **I. Introduction**

The hypothesis that higher education leads to more democratic politics (Lipset 1959, 1960) has received a good deal of empirical support (Barro 1999, Glaeser et al. 2004, Papaioannou and Siourounis 2005). However, the theoretical reasons for this relationship remain unexplored. In this paper, we investigate theoretically and explore empirically why stable democracies are so rare outside of countries with high levels of education.

Our starting point is the connection between education and political participation. This connection has been emphasized by Almond and Verba (1989, 1<sup>st</sup> ed. 1963), who see education as a crucial determinant of “civic culture” and participation in democratic politics. “The uneducated man or the man with limited education is a different political actor from the man who has achieved a higher level of education (p. 315).” Almond and Verba’s work has influenced both political science (e.g., Brady et al. 1995) and sociology (e.g., Kamens 1988), and our work can be seen as an elaboration of their ideas using theoretical and empirical tools of economics.

We begin in Section II by presenting some old and some new facts about education and democracy. We show that more educated democracies are more stable than the less educated ones, that higher education levels predict transition from dictatorship to democracy but not the other way around, and that the relationship between education and democracy holds within as well as across countries. The available evidence suggests that, consistent with Lipset, education causes democracy.

In Section III, we motivate the basic assumption of our theoretical model, namely that education leads to higher participation in a whole range of social activities, including politics. Using micro-evidence from both the United States and the rest of the world, we document the robust correlation between different forms of civic activity, including political participation, and education. These relationships appear strong at almost any level of aggregation.

The correlation between years of education and civic activity is clear; the reasons for this correlation are less obvious. In one view, schooling incorporates indoctrination about the virtues of political participation. A second view holds that much of human capital is actually social capital and that schools specialize in training people to interact with one another. Indeed, at least two of the three Rs (reading and writing) are skills for interpersonal communication. By improving social skills, education encourages civic involvement. A third hypothesis sees the more educated as better or just more effective at everything. More educated people are more civic because their returns to civic activities are higher. We review these theories and the evidence for them in section III.

Using this evidence, we present a model of regime stability in Section IV. We define democracies as regimes whose benefits are distributed among large numbers of citizens, and dictatorships as regimes whose beneficiaries are few in number.<sup>1</sup> Dictatorships offer sharp incentives to their supporters because regime insiders earn large political rents. Democracies offer much weaker incentives because the political rents are shared among many people. Our core assumption is that education raises the benefits of political participation. As a consequence, more inclusive regimes have more people willing to fight for them as the level of human capital increases.

In this model, the political success of a democracy hinges on having a large number of supporters whose benefits of political participation are sufficiently high that they fight for it despite the relatively low personal benefits of democratic victory. Higher levels of education make democracy more stable, because educated people face higher benefits of political participation and are consequently more likely to support democracy even when it offers few personal rewards. Conversely, in countries with low levels of education, dictatorship is more stable than democracy, because only dictatorships offer the strong incentives needed to induce people to defend them.

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<sup>1</sup> Following the Oxford English Dictionary, we think of democracy as popular government or government by the people. Schumpeter (1942) defines democracy in terms of competition for votes, and that definition is accepted by Huntington (1991) and Posner (2003). Because we consider competition between democracies and dictatorships, for us the central difference is the distribution of political spoils in different regimes. Most precisely, democracy in our model is government *for* the people.

In the model in Section IV, countries with higher levels of education are more likely both to experience a transition from dictatorship to democracy, and to withstand anti-democratic challenges. Moreover, the size of the most successful challenger regime to an existing dictatorship rises with the level of education.

In Section V, we present several case studies illustrating the model, which deal with both democratization experiences and dictatorial coups against democracy. While all the historical evidence presented in section V is anecdotal, it is broadly consistent both with the empirical relationships between education and democracy illustrated in Section II, and the specific causal mechanism that we propose in our model.

## **II. The Empirical Relationship between Education and Democracy**

Across the world, the correlation between education and democracy is extremely high.<sup>2</sup> Figure 1 shows the relationship between the Polity IV index of democracy (Jagers and Marshall 2003) and the years of schooling in the country in 1960 (Barro and Lee 2000). Across 91 countries, the correlation coefficient between these variables is 74 percent.

In Table 1a-1c, we consider the effect of education on the stability of both democracies and dictatorships. For a country to be included in this sample, we required Barro and Lee's data on schooling in the initial year, as well as Jagers and Marshall's (2003) continuous democracy classification since the initial year. For this table, we classify all countries with Polity IV ratings of or below 4 as dictatorships and those with ratings above 4 as democracies. The cutoff of four roughly corresponds to the sample median in 1960. Following Glaeser et al. (2004), we classify countries as well-educated if they have above 5.01 years of schooling in 1960 (the 75<sup>th</sup> percentile in the sample schooling distribution in 1960), moderately educated if they have below 5.01 but above 2.68 years

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<sup>2</sup>Alvarez et al. (2000), Barro (1999), Boix and Stokes (2003), Glaeser et al. (2004), and Papaioannou and Siourounis (2005) also consider the relationship between income and democracy. The conclusion emerging from the controversies is that income does cause transition to democracy, as well as its stability. Our focus, however, is on education not income. Nor do we consider the consequences of democracy, see, e.g., Przeworski and Limongi (1993) and Mulligan et al. (2004).

of schooling (the 50<sup>th</sup> percentile of the sample schooling distribution in 1960), and low-educated if the 1960 years of schooling are below 2.68 years.

Table 1a covers the well-educated countries. In the first row, we count that 20 (out of 22) of these countries were democracies in 1960. The only two well-educated dictatorships were Hungary and Poland, which were non-democratic because of foreign occupation and whose people rebelled against the Soviet-backed dictatorships. Of the 20 well-educated democracies in 1960, every one except for Uruguay (one of the least educated countries in this group) remained democratic over the next 40 years. Both Poland and Hungary became democracies by 1990.

The second row in Table 1a takes 1970 as the starting point and looks over the next 30 years. 22 out of 26 well educated countries are democracies in 1970, and four were dictatorships. In this year, Argentina and Greece join Hungary and Poland as well educated dictatorships. Of the 22 democracies, two lost this status by 2000. All four dictatorships circa 1970 turned democratic by 1990. The third row begins in 1980. While there are 9 well-educated dictatorships in that year, all become democratic by 2000, and all 25 democracies stay democratic for the next 20 years. Starting in 1990, we again see the permanence of democracies, and the tendency of dictatorships to become democratic even within a decade. Averaging across the starting years 1960, 1970 and 1980, the probability of a well-educated democracy remaining a democracy twenty years later is 95 percent. The probability of a well-educated dictatorship becoming a democracy within 20 years is 87 percent.

In Table 1b, we turn to countries with moderate education. Three results in this panel are striking. First, the probability of starting out as a democracy is much lower. Only 11 of 17 countries with this level of education are democracies in 1960, and only 7 out of 19 in 1970. Second, the survival rate for democracies is lower. Averaged across the starting years 1960, 1970 and 1980, the probability of a moderately-educated democracy remaining a democracy twenty years later is down to 74 percent. Third, the likelihood that a dictatorship turns into a democracy is lower as well. Averaged over 1960, 1970,

and 1980, the twenty year democratization rate is down to 54 percent from the 87 percent level for high education countries.

In Table 1c, we examine countries with fewer than 2.7 years of education in the initial period. Democracies in this group are rare indeed. In 1960, there are only four poorly educated democracies. Of these, only India and Venezuela survive over the next forty years, and Venezuela's democracy score has been falling since 1990.<sup>3</sup> In 1970, there are only three democracies with this little education. Only India survives over the next thirty years. In 1980, there are four democracies with less than 2.7 years of schooling. Two of those survive over twenty years. Finally, there are five democracies with less than 2.7 years of education in 1990, only two of which survive over ten years. Averaged across the starting years 1960, 1970 and 1980, the probability of a low-educated democracy remaining one twenty years later is only 54 percent. We can make similar calculations for the democratization of low education dictatorships. Averaged over the starting years 1960, 1970, and 1980, the probability that such a dictatorship democratizes is 26 percent.

We thus see that high education democracies are more persistent than low education ones, and that high education dictatorships are more likely to democratize than low education ones. But is this relationship causal, as opposed to causality running from democracy to education? The evidence on transitions from dictatorship to democracy suggests that it is, and it can be confirmed with more formal analysis of transitions. Figure 2 shows the raw correlation between the change in the Jagers and Marshall (2003) democracy score and years of schooling in 1960 (from Barro and Lee) for countries that began this period with democracy ratings of zero or one. The raw correlation between schooling and the growth of democracy for this group of countries is 66 percent.

If we take the entire sample of countries and regress the change in democracy on initial democracy and initial years of education, we estimate:

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<sup>3</sup> India remains a striking outlier. One possible explanation is that despite the low level of India's average education, the country's huge population includes millions of educated people. The size of India's educated elite ensures that democracy has defenders, despite the large uneducated population.

$$(1) \text{ Change in Democracy} = 4.13 - .98 \bullet \text{ Democracy in 1960} + .84 \bullet \text{ Schooling in 1960}$$

(.48)
(.09)
(.15)

There are 65 observations in this regression and the R-squared is 67 percent. Initial years of schooling, even in highly dictatorial regimes, are an extremely good predictor of becoming more democratic over time. In contrast, democracy does not predict growth in schooling. We estimate:

$$(2) \text{ Change in Schooling} = 2.80 + .07 \bullet \text{ Democracy in 1960} - .08 \bullet \text{ Schooling in 1960}$$

(.28)
(.05)
(.09)

There are 68 observations in this regression and the R-squared is only three percent. The relationship between initial democracy and changes in years of schooling in society is shown in Figure 3. While both in Table 1 and here the evidence suggests that schooling leads to democracy, there is no evidence that democracy leads to schooling.

This evidence is subjected to more formal specifications by Glaeser et al. (2004) and Papaioannou and Siourounis (2005). Both studies confirm that education is a strong predictor of transition to democracy. The second study in particular, by focusing on the third wave of democratizations, shows that education is a powerful predictor of permanent transitions from dictatorship to democracy.

One objection to these findings is that some permanent country characteristics, such as geography or culture, are responsible for producing both education and democracy. In Table 2, we address this concern by estimating the relationship between education and democracy in regressions with country fixed effects:

$$(3) \text{ Democracy}_{i,t} = \alpha_t + \theta_i + \beta \bullet \text{ Schooling}_{i,t} + \varepsilon_{i,t},$$

where  $\alpha_t$  represents a year fixed effect,  $\theta_i$  is a country fixed effect and  $\varepsilon_{i,t}$  is a country-year error term. Table 2 reports several specifications so that we can compare the results

for both different data sets and different time periods. In all specifications, we use the Jagers and Marshall (2003) democracy score.

The first column of Table 2 reports the results for the period 1960-2000, and uses the Barro and Lee schooling variable—the same period and the same data as we used in Table 1. With country and year fixed effects, the coefficient on years of schooling is no longer significant – indicating that a common cause explanation might indeed be valid. However, the Barro and Lee measure is well known for its extreme persistence. As documented in Glaeser et al. (2004), the correlation between Barro and Lee years of schooling in one year and that ten years later is never less than 97 percent. This suggests that longer panels, new data, or both are needed to estimate any within-country relationship between education and democracy.

Accordingly, in the rest of Table 2 we use Banks (2004) data on university and secondary school enrollments from 1865 to 2000. The enrollments data are not nearly as persistent as the Barro and Lee measure, although conceptually they reflect investments in rather than stocks of human capital. The panel is unbalanced and over the entire time period we have 133 countries. We have data at five year intervals giving us 25 time periods and a total of 1316 observations.

In the second and third columns, we keep the time period 1960-2000, but include separately secondary school and university enrollment measures from Banks. Even for the short forty year interval, the effects of enrollments on democracy are now large and statistically significant in a country fixed effects specification. That is, within countries, education predicts democracy. In the fourth and fifth specifications, we again use secondary school and university enrollment separately, but now use the whole time period from 1865 to 2000. The coefficients on education variables rise in magnitude and statistical significance. The coefficient of 0.290 on secondary school enrollment means that a ten percent increase in secondary school enrollment is associated with a 2.90 point increase in the democracy score – a huge change. The coefficient of 0.850 on university enrollment implies that a one percent increase in university enrollment is associated with

a 0.85 point increase in the democracy score. The sixth regression includes both secondary school and university enrollment together. In this specification, both coefficients fall, although that on university remains statistically significant.

In the final regression, we present the results for a specification that does not include country fixed effects. Both coefficients more than double, reflecting the fact that the correlation between education and democracy is stronger across countries than within countries over time. This result is unsurprising, and could easily reflect an effect of school enrollment at a point in time on democracy in later time periods, both because people influence politics over their entire lives, and because educated people can create lasting political institutions. Still, despite these issues of timing, Table 2 shows a strong relationship between education and democracy within and not just across countries.

The bottom line of this section is strong support of Lipset's (1960) hypothesis. Education is highly correlated with democracy in both cross-section and panel regressions with fixed effects. Moreover, the effect seems to be causal, as evidenced by the evidence on transition to democracy. The question now is what theory best explains these results.

### **III. Education and Civic Participation**

Education may promote democracy because it raises the benefits (or reduces the costs) of political activity. In section IV, we take this as an assumption and show how it explains the evidence. In this section, we describe some theories of why education raises civic participation and then present some empirical evidence bearing on them.

#### *Why Should Education and Civic Participation Be Correlated?*

Perhaps the simplest hypothesis explaining the link between education and civic participation is that indoctrination about political participation is a major component of education. In democracies, schools teach their students that political participation is good. One "content standard" listed by the State of California's Department of Education

aspires that students “understand the obligations of civic-mindedness, including voting, being informed on civic issues, volunteering and performing public service, and serving in the military or alternative service.” The original public school movement in the United States emphasized preparing students for participation in democracy. This emphasis is not unique to America. Holmes (1979) synthesizes the aims of schools systems around the world. Political aims are often cited as an educational goal: “school work is organized so as to develop democracy in school and consequently in society as a whole” (Sweden), “the Constitution states that a general aim of education is to produce good citizens, a democratic way of living and human solidarity” (Costa Rica), and “an education system that creates knowledgeable, democratic and patriotic citizens is the aim of the Indonesian government.” Perhaps the key implication of the indoctrination hypothesis is that the positive impact of schooling should be particularly pronounced in political rather than all social participation.

A second hypothesis holds that schooling lowers the costs of social interactions more generally. According to this view, a primary aim of education is socialization—teaching people how to interact successfully with others. Such successful interaction includes understanding and appreciating the others’ point of view, as well as being able to effectively communicate one’s own, through both writing and speech. When people can communicate successfully, they may be able to control any innate anti-social tendencies, and as a consequence become more productive participants in group activities (Bowles and Gintis, 1976). Formally, socialization can be thought of as raising the benefits of social engagement, or reducing the costs of such engagement, or increasing the productivity of working together in groups.

Education textbooks list socialization as a pillar of curriculum design. Driscoll and Nagel (2005) describe several curricular approaches to primary education. Many of these list social outcomes among the goals: “the children will develop cooperative relationships, reflecting both social skills and understanding the perspectives of others” (the Kamii and DeVries approach); “socialization of children. Self-regulation of behavior is necessary to participation in forms of society and in relationship with others” (the Bank Street

approach); and “conditions that promote or strengthen relationship between children, and between children and adults” (the Waldorf approach). Gordon and Browne (2004) write that “a major role for the early childhood teacher is to see that children have enjoyable social contacts and to help motivate children toward a desire to be with others,” because “enhancing social intelligence builds a set of skills that may be among the most essential for life success of many kinds.”

Why do schools spend so much effort on socializing children? An altruistic view might suggest that the ability to work well in social settings is among the most important skills needed to function in society. A more cynical view sees socialized children as easier for their teachers to manage. Whatever the reason, schools in all political and religious regimes devote considerable resources to teaching social cooperation.

The socialization hypothesis predicts that education should impact all forms of social involvement. Its ability to predict political engagement should be no stronger than that for other forms of social participation. This theory also predicts no difference in the impact of education on social activities in democracies or non-democracies.

A third hypothesis holds that schooling raises political participation because it increases the personal material benefits of such participation. After all, the usual economist’s interpretation of education is that it increases cognitive capabilities and effectiveness. The impact of education on competence should not be limited purely to the economic domain; more educated people are more likely to become political or civic leaders just as they are more likely to earn more money. Higher returns from civic activity for the more educated might explain a positive link between education and civic engagement.

The benefits hypothesis predicts that education should be most strongly associated with forms of civic engagement which yield private returns. Participation in lobbying groups or trade unions may be attractive because these groups serve the individual’s interests. However, education is unlikely to raise the private returns to voting (or suicide bombing).

A final hypothesis holds that the link between schooling and education represents selection, not treatment, and that exogenous characteristics that make people tolerant of classroom education also make them tolerant of sitting through meetings or waiting in line to vote. This hypothesis predicts that exogenous increases in schooling would have no impact on overall levels of civic participation. Furthermore, if innate characteristics vary more within than across areas, this hypothesis predicts a low (or non-existent) relationship between education and civic participation at the aggregate level.

#### *Empirical Evidence on the Education and Civic Participation*

Using the World Values Survey (WVS), we begin with cross-country evidence on education and membership in social groups. We exclude countries with the Polity IV autocracy score above 5 from the analysis because these countries force party and other participation. (For example, 25% of the Chinese respondents report membership in the Communist party). Figure 4 presents the results for the available 28 countries. It shows a sharply positive and statistically significant ( $t=2.49$ ) relationship between education and participation in social groups. This evidence is broadly consistent with our theoretical perspective, but unfortunately does not allow us to distinguish the various hypotheses.

We can do that better with individual-level evidence from the United States. There are two primary individual-level sources for information on social activities: the General Social Survey (GSS) and the DDB Needham Lifestyles Survey. Using the GSS, DiPasquale and Glaeser (1999) document a strong positive relationship between education and a variety of social outcomes. College graduates are 27 percent more likely than high school dropouts to say that they vote in local elections and 29 percent more likely to say that they help solve local problems. Education also correlates with knowledge of public officials such as one's U.S. representative or school head.

College graduates are also more likely to join organizations. Glaeser and Sacerdote (2001) show this to be true for fifteen out of sixteen forms of group membership: the exception is trade union membership. Using the WVS, they also find a significant positive relationship between years of education and group membership in almost every

country. Education also positively predicts church attendance in the GSS. Fifty percent of American college graduates say that they attend church more than several times per year; thirty-six percent of high school graduates say they attend that often.

Using evidence from the DDB Needham Lifestyles Survey, we reproduce some of those results in Table 3. The DDB Needham Survey is administered over the years 1975-1999 and covers (for many questions) a larger sample than the GSS. We control for basic demographics such as age, race and gender. All of our variables are categorical and take discrete values capturing the frequency of the activity. We normalize each of these variables to have a mean of zero and a standard deviation of one. We also control for income. Because (as in the GSS) income is missing for many observations, we include these observations but code them as having the mean value of income in the sample, and add a dummy which takes on a value of one when income is missing. We also include a dummy for each survey year to capture time trends in social activities. We measure education with two separate dummy variables. The first takes on a value of one if the person is a high school graduate and zero otherwise. The second variable takes on a value of one if the person is a college graduate and zero otherwise. Our results do not change if we use continuous measures of education.

In each regression, both education variables positively affect participation and both are almost always statistically significant. The first regression shows the impact of education on attending church. The effect of being a college graduate relative to a high school dropout is more than 30 percentage points. The second regression shows the large and positive impact of education on attending a class or a seminar.

Regression (3) shows a strong association between schooling and self-reported working on a community project. In the fourth regression, we look at writing a letter to a newspaper, a particularly clear form of civic engagement. Again, the correlation with education is positive, and the effect of college education is particularly strong. Since the mean of this variable is much lower than that of many others, we should not be surprised

that the coefficients on schooling are smaller. Regression (5) shows results on contacting a public official. Again, the impact of education is strong.

Regression (6) looks at registering to vote. Obviously this variable is an important measure of political participation in a democracy. Registering to vote (and voting) is particularly strongly associated with years of education. Finally, in regression (7) we consider giving someone the finger—an anti-social form of behavior. It is strongly negatively associated with years of schooling. These regressions show a pervasive pattern, in which years of schooling are associated not only with political participation in a democracy, but also with many other forms of social engagement.

Because our model addresses political battles that are often violent outside the U.S., we now turn to the evidence on more violent forms of group activity. Education and training are closely linked to military discipline and group coherence under fire (Hanson, 2002). Following Keegan (1976) and many others, Hanson argues both that historically military success is primarily the result of troops not fleeing under fire and that military discipline is itself the result of culture and education. Costa and Kahn (2003) show that illiteracy strongly predicts desertion among Union soldiers in the American Civil War.

Ferguson (1999) looks at the ratio of prisoners of war to total casualties across countries during the First World War. This variable is described by some military historians as a measure of soldiers' willingness to surrender, as opposed to fight, under fire. Across major combatant countries, the ratio of prisoners to total casualties was the lowest the United Kingdom, the United States, and Germany (1.4%, 6.7% and 9% respectively). These arguably were the best educated combatants. The ratio of prisoners to total casualties was the highest among Russians, Austro-Hungarians and Italians (51.8%, 31.8% and 25.8%) – the least educated of the major combatants. More standard forms of military history corroborate that these prisoner rates capture general failures of morale.

Krueger and Maleckova (2003) and Berrebi (2003) analyze the connection between education and terrorism in the Middle East. Although some observers think that

desperation drives terrorism, terrorists see it as a form of pro-social activity that supports their community. Indeed, both studies find a positive association between terrorism and years of education. Krueger and Maleckova (2003) show that education positively predicts participation in Hezbollah activities in Lebanon. Berrebi (2003) shows that more educated Palestinians are more likely to be suicide bombers.

Finally, two recent studies specifically address the selection hypothesis. Millian, Moretti, and Oleopolos (2004) find that exogenous increases in education due to compulsory schooling laws raise voter turnout. Dee (2004) finds that increases in education accounted for by availability of junior and community colleges have a large effect on subsequent participation in voting. These results suggest that the effect of education on political participation is causal, rather than just the consequence of selection.

Can the evidence help us distinguish between the other hypotheses? The fact that education predicts such social behavior as suicide bombing and voting, which do not earn private rewards, is inconsistent with the private benefits hypothesis. The fact that education increases all forms of participation, many of which are deeply apolitical, goes against the political indoctrination hypothesis. Given the separation between church and state in the U.S. and U.K., and given the often anti-religious sentiment of the French state, the positive correlation between years of education and church attendance is hard to understand as reflecting political indoctrination.

The theory that best explains all of the facts is the second hypothesis: education is socialization. This theory predicts the universal relationship between education and participation across activities and across countries. Of course, this does not mean that other mechanisms do not also operate, but we are inclined to accept the view that acquiring social capital is a crucial part of acquiring human capital.

#### IV. A Model of Education and Democracy

In this section, we model a channel through which education encourages democracy, both by increasing its stability and by increasing the probability of transition to democracy. The critical assumption, following the evidence of the previous section, is that education raises the benefits of political participation. The core insight of the model is that democracy requires support from a broad base of citizens who face only weak incentives to fight for it, while dictatorships offer strong incentives to a narrow base of supporters. Education raises the benefits of political participation and ensures that enough people support democracy even when they face only weak incentives.

##### *Model Setup*

We assume that the country is populated by measure 1 of homogeneous citizens, each with a human capital level of  $h \geq 0$ .<sup>4</sup> A regime is defined as a set  $G$  of insiders, with  $g \in [0,1]$  being the measure of the set, or the size of the regime. We interpret a larger  $g$  as a more democratic regime. We call a regime with  $g = 1$  a perfect democracy.

In period zero, there is an exogenous *status quo* regime  $G_0$  of size  $g_0$ . In period one, an alternative regime,  $G_1$  of size  $g_1$ , is proposed. Membership in both regimes is exogenous. In period two, individuals choose whether to defend the existing regime, to fight for the new regime, or to stay politically uninvolved. Individuals may not support both regimes. Thus, in this model, while each individual takes as given his membership in a particular regime (or in neither), he still *chooses* whether to participate in politics.

We let  $s_0$  denote the endogenously determined measure of people who support the old regime and  $s_1$  denote the measure of people who support the new regime. The

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<sup>4</sup>In Bourguignon and Verdier (2000), as in our model, political participation depends on education, but education is determined by the initial income distribution.

challenger unseats the incumbent if and only if  $\varepsilon_0 s_0 \leq \varepsilon_1 s_1$ , where  $\varepsilon_i$  are random shocks to the effectiveness of each faction's supporters. The ratio  $\rho \equiv \frac{\varepsilon_0}{\varepsilon_1}$  has a continuous probability distribution  $Z(\rho)$  on  $\mathbb{R}^+$ .<sup>5</sup>

Each decision-maker is of measure zero and so does not impact the probability that either regime succeeds. Individuals therefore do not base their political participation decisions on their impact on the outcome. Instead, participation is based on three different forces. First, regimes provide incentives to their members to participate. We assume that these incentives take the form of punishing regime insiders who do not fight for it. Second, regime insiders who participate themselves motivate their fellow insiders to join them. We model this as a benefit from participation. We also assume that there are individual-specific costs of participation.

We formally model a regime's power to motivate insiders by assuming that insiders who fail to support the regime suffer an expected utility loss equal to  $p(g)$ . We assume that  $p$  is a monotone decreasing function of  $g$ , ranging from  $p(0) = \bar{p}$  to  $p(1) = \underline{p} \geq 0$ . Smaller groups impose larger punishments on free-riders. This assumption follows Mancur Olson in assuming that smaller groups are better at solving free-rider problems: "the greater effectiveness of relatively small groups [...] is evident from observation and experience as well as from theory" (Olson 1965, p.53). Smaller groups benefit from mutual monitoring and punishment of transgressors. As Olson (p.61) writes: "In general, social pressure and social incentives operate only in groups of smaller size." This assumption sets up the basic tradeoff between smaller and larger regimes. Smaller regimes provide strong incentives to a small base. Larger regimes provide much weaker incentives but to a larger potential base of supporters.

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<sup>5</sup> In particular, if  $\zeta$  is the density of  $\varepsilon_i$  it is straightforward to compute the distribution

$$Z(\rho) = \int_0^\infty \int_0^{\rho \varepsilon_1} \zeta(\varepsilon_1) \zeta(\varepsilon_0) d\varepsilon_0 d\varepsilon_1 \text{ and its density } z(\rho) = \int_0^\infty \zeta(\rho \varepsilon) \zeta(\varepsilon) d\varepsilon .$$

We allow for the possibility that the incumbent regime can have an advantage in eliciting support, which is modeled by assuming that insiders in an incumbent regime who fail to support it pay an additional expected utility cost of  $a \geq 0$ . This incumbent advantage may simply reflect access to the machinery of the state.

The threat of punishment captures the global incentives provided by the leaders to all insiders. We also allow regime insiders who participate to be able to motivate their peers to do likewise. While the regime level motivation should be thought of as leaders threatening members, we think of this local motivation as friends convincing friends to come out and fight. Precisely because of their local nature, these benefits are independent of the aggregate size of the regime. On the other hand, we assume that they are a function of the human capital of regime members. Following the previous section's discussion of the connection between education and all participation, we assume that the local incentives are represented by a function  $b(h)$  that is monotonically increasing in  $h$ , ranging from  $b(0) = \underline{b}$  to  $\lim_{h \rightarrow \infty} b(h) = \bar{b}$ . In this case, higher levels of human capital make people better at inducing their peers to politically participate.

The function  $b(h)$  captures the role of education in creating social skills, in two different ways. First, better educated people are better at cajoling, encouraging, motivating, or otherwise persuading others they interact with to join them. Second, more educated people are better able to reap the benefits of social interaction themselves, perhaps because they understand better *why* they are participating. In line with the discussion in Section III, socialization covers the twin powers to persuade and to understand. We capture both of these in  $b(h)$ . It is more appealing to participate in a collective activity the more educated a person is, and the more educated are the other participants.

Offsetting the global and local incentives is an effort cost of political participation, which equals  $c + \eta$ , where  $c > 0$  is the average cost and  $\eta$  a mean-zero idiosyncratic shock that

is identically and independently distributed across all individuals. This shock is realized at the start of period two, after membership in the two regimes has been defined. We make two technical assumptions on the distribution of cost shocks: (1) the distribution function  $F(\eta)$  is log-concave, and (2)  $\eta$  has support  $[\underline{\eta}, \bar{\eta}]$  such that

$\underline{\eta} \leq \underline{p} + \underline{b} - c < \bar{p} + \bar{b} - c \leq \bar{\eta}$ . The first assumption implies that  $\frac{f(\eta)}{F(\eta)}$  is monotonically

decreasing in  $\eta$ . This assumption is “commonly made in the incentives literature and is satisfied by many distributions” (Laffont and Tirole 1988, p. 1157). Bagnoli and Bergstrom (1989) show that this assumption is satisfied by the uniform, normal, lognormal, exponential, Pareto, logistic, gamma, chi-square, extreme-value, power-function, Weibull and Laplace distributions, and by any truncation thereof. The second assumption is simplifying, and implies that among individuals belonging to one and only one regime there are always some supporting the regime and some choosing not to participate, regardless of regime size and human capital. This assumption enables us to avoid the uninteresting case where there is no margin of participation in a regime.

### *Human capital and political competition*

Consider a contest between two exogenously formed regimes  $G_0, G_1$ . Individuals excluded from both regimes abstain from political participation since they reap no benefits and only incur costs. Members of  $G_0$  and not  $G_1$ , whose mass is denoted by  $\hat{g}_0$ , have two options: abstaining, which has a cost  $p(g_0) + a$ , or participating in support of  $G_0$ , which has a cost  $c + \eta - b(h)$ . Likewise, members of  $G_1$  and not  $G_0$ , whose mass is denoted by  $\hat{g}_1$ , can abstain at a cost  $p(g_1)$  or support  $G_1$  at a cost  $c + \eta - b(h)$ . Finally, some individuals could belong to both regimes: they can then choose to abstain at a cost  $p(g_0) + p(g_1) + a$ , to support  $G_0$  at a cost  $p(g_1) + c + \eta - b(h)$ , or to support  $G_1$  at a cost  $p(g_0) + a + c + \eta - b(h)$ .

It is immediate that if  $g_1 > g_0$  no incumbents can be induced to switch allegiance: conditional on participation, they always prefer to fight for the current regime both

because it is smaller and because of the incumbency advantage. The model thus suggests that franchise-expanding revolutions would have strategic incentives to exclude all former insiders (indeed, there are many examples including France 1793, Russia 1918, and China 1949 where former insiders were ruthlessly killed or excluded from membership in the new regime). More generally, politically active members of both regimes support the incumbent if and only if  $a > p(g_1) - p(g_0)$ .<sup>6</sup>

We can now compute support levels for the two regimes. If  $a > p(g_1) - p(g_0)$ , then total support for the incumbent is  $g_0 F(p(g_0) + a + b(h) - c)$ , and that for the challenger  $\hat{g}_1 F(p(g_1) + b(h) - c)$ . If  $g_1 < g_0 \wedge 0 \leq a \leq p(g_1) - p(g_0)$ , then total support for the incumbent is  $\hat{g}_0 F(p(g_0) + a + b(h) - c)$  and that for the challenger  $g_1 F(p(g_1) + b(h) - c)$ . Putting these two pieces together, the probability that the challenger  $G_1$  replaces the incumbent  $G_0$  equals

$$(1) \quad \pi = \begin{cases} Z \left( \frac{g_1 F(p(g_1) + b(h) - c)}{\hat{g}_0 F(p(g_0) + a + b(h) - c)} \right) & 0 \leq a \leq p(g_1) - p(g_0) \\ Z \left( \frac{\hat{g}_1 F(p(g_1) + b(h) - c)}{g_0 F(p(g_0) + a + b(h) - c)} \right) & a > \max\{0, p(g_1) - p(g_0)\} \end{cases}$$

Differentiation then yields:

**Proposition 1:** Consider a contest between two given regimes  $G_0, G_1$ :

(a) If  $g_1 > g_0$  or  $g_1 < g_0 \wedge 0 \leq a \leq p(g_1) - p(g_0)$ , the probability that the more inclusive regime succeeds is increasing in the level of human capital.

(b) If  $g_1 < g_0$  or  $a > p(g_1) - p(g_0) \geq 0$ , the probability that the less inclusive challenger succeeds is increasing in the level of human capital.

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<sup>6</sup> The assumption that members who are indifferent will support the challenger is immaterial and merely simplifies notation.

The mechanism underpinning part (a) of the proposition can easily be grasped graphically. The area of each bar in Figure 5 represents the total support for one regime at two levels of  $h$ , with higher support resulting from higher human capital. The bar with the broader base captures the support for the democracy and the bar with the narrower base represents support for dictatorship. As education increases, both regimes receive more support, but because the democratic regime has by definition a broader base, the increase in numbers is higher for that regime.

Dictatorial regimes provide strong incentives for a favored few; democratic regimes with many insiders provide weak incentives for their potential supporters. The larger group has a wider base of supporters, but a lower participation rate. Higher levels of human capital favor democratic regimes because they increase the benefits of participation for everyone, and encourage a larger fraction of the many beneficiaries from a democracy to participate to save it from a more dictatorial alternative. In the case presented in the figure,  $\eta$  is uniformly distributed, so that the increase in the participation rate is identical for both groups regardless of their size. It is then immediate that the larger group derives a higher increase in its total support. More generally, the assumption that  $F(\eta)$  is log-concave ensures that, for a given rise in  $h$ , the proportional increase in the participation rate is always at least as great for the smaller as for the larger group.

Figure 6 presents the relationship between human capital and the probability that a regime  $G_0$  is replaced by a larger, non-overlapping regime  $G_1$  for the case where  $\varepsilon$  is log-normally distributed,  $\eta$  is uniformly distributed, and specifications of  $p$  and  $b$  are consistent with our assumptions. In particular, the graph considers two challengers to a regime of size  $g_0 = 15\%$  : the flatter curve represents a challenge by the marginally larger oligarchy  $g_1 = 20\%$  , while the more concave curve one by the almost democratic complement regime,  $g_1 = 85\%$  . When education is low, a challenge by a rival oligarchy is much more likely to be successful. As education increases, the threat coming from a democratic uprising eventually becomes dominant.

Part (b) of Proposition 1 shows that with a sufficiently large incumbency advantage, education need no longer help the more inclusive regime, because education makes incumbency less valuable. The assumption that  $\frac{f(\eta)}{F(\eta)}$  is monotonically decreasing in  $\eta$  means that increasing education always helps the group with weaker initial incentives to participate. With an incumbency advantage  $a > p(g_1) - p(g_0) \geq 0$ , the larger incumbent offers stronger incentives even if  $g_1 < g_0$ . In this case, therefore, an increase in education helps the challenging regime. When the challenger regime is larger than the incumbent, it offers weaker incentives both because of its size and because it lacks the incumbency advantage, and as a consequence education always helps it.

This part of the proposition suggests that education can create instability among competing dictatorial regimes of roughly the same size. When people are uneducated, even a small incumbency advantage ensures that the *ancien regime* continues to win out. As education rises and there are more potential participants, the probability of success for another dictatorial challenger increases.

If we focus on perfect democracy, with  $g_1 = 1$ , it is immediate that a democratic challenge to a dictatorial regime always falls under part (a) of the proposition. The probability that democracy succeeds in replacing oligarchy is then increasing in the level of human capital.

In the opposite case, an oligarchic coup by a group  $G_1 : g_1 < 1$  attempts to overturn a perfect democracy  $G_0 : g_0 = 1$ . This case is central to the stability of democratic regimes and is meant to shed light on situations in the developing world where initially democratic regimes are subverted by coups perpetrated by either outsiders or government insiders. It is important to note, first, that the coup is abortive if  $a > p(g_1) - \underline{p}$ , for then none of the prospective oligarchs switch allegiance from democracy to the challenging

regime. As a consequence, democracy is perfectly stable if the incumbency advantage is sufficiently high, namely if  $a > \bar{p} - \underline{p}$ . If the coup has any probability of success, then we must once again be in the region described by part (a) of the proposition, and the probability that the coup succeeds in upending democracy is decreasing in the level of human capital. As before, as education rises, more people are willing to support democracy despite the weaker incentives it offers.

### *Endogenous Regime Size and the Stability of Regimes*

We have shown that, among two rival regimes of exogenous sizes, an increase in human capital makes it more likely that the more inclusive one prevails. In particular, democracy is more likely to be instituted and preserved. We next address the possible endogeneity of regime sizes by asking which regime size maximizes the probability of a successful revolution. We do not formally model the decision-making process of regime-builders, but rather assume that the success-maximizing size will be favored.

We now assume that  $\eta$  is uniformly distributed on  $[-\bar{\eta}, \bar{\eta}]$  with  $\bar{\eta} \geq \max\{c - \underline{p} - \underline{b}, \bar{p} + \bar{b} - c\}$ . We also assume that  $p$  is three times continuously differentiable, and that  $p''' > 0$ , which makes it possible for the cost of abstention to be first a concave and then a convex function of group size. Figure 7 shows an example of  $p$  used in our simulations.

We start by analyzing a contest between competing oligarchies. To simplify the analysis we assume that the challenger cannot recruit members of the incumbent oligarchy, or analogously that it is counterproductive to do so due to a sufficiently large incumbency advantage  $a > \bar{p} - p(g_0)$ .

For a fixed incumbent regime,  $G_0$ , the support of the non-overlapping challenger

$G_1 : G_0 \cap G_1 = \emptyset$  is equal to  $s(g_1) = g_1 \frac{p(g_1) + b(h) - c + \bar{\eta}}{2\bar{\eta}}$ . Increasing the size of a

group has two opposing effects on its support: broadening the base and decreasing the incentives for that base to participate. The assumptions on  $p$  imply that the function is initially increasing in  $g_1$  and if  $p'(g_1)$  is sufficiently negative, the function will eventually decrease. Assuming that for sufficiently low levels of human capital  $h \simeq 0$  the size  $g_1^*$  of the challenging regime that maximizes its support is interior, it follows that:<sup>7</sup>

**Proposition 2:** The size  $g_1^*$  of the non-overlapping challenging regime that is most likely to overthrow a dictatorship  $G_0$  is increasing in the level of human capital  $h$ , and may jump discretely to  $(1 - g_0)$  when  $h$  crosses a threshold  $\hat{h}$ .

As human capital increases, the biggest threat to a dictatorship becomes an ever more democratic regime. For a sufficiently high level of human capital, the most successful revolution includes all but the members of the previous regime. The most surprising element in this proposition is the jump. Figure 8 below shows a possible graph of the support for a challenger to a dictatorship with  $g_0 = 15\%$ ; of course, higher curves are associated with higher levels of  $h$ . In this case, there is indeed a discrete jump to the corner solution as human capital increases above  $\hat{h}$ , as shown by Figure 9.

The intuition for the jump in the size of the support-maximizing regime comes from the basic economics of regime size. For low levels of  $g_1$ , support increases with regime size. As size continues to grow, incentives rapidly decrease, which echoes the transition from a “small” to a “large” regime in Olson’s analysis. In this intermediate range, support decreases with regime size. As  $g_1$  rises even further,  $p(g_1)$  asymptotes towards its lower

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<sup>7</sup> This requirement is equivalent to the formal condition that  $\exists \hat{g}_1 \in (0, 1 - g_0) : \hat{g}_1 [p(\hat{g}_1) + \underline{b} - c + \bar{\eta}] > (1 - g_0) [p(1 - g_0) + \underline{b} - c + \bar{\eta}]$ , failing which the support-maximizing size of the challenger would be  $g_1^* = 1 - g_0 \forall h \geq 0$ ; the latter case remains in fact mathematically consistent with Proposition 4, but becomes economically uninteresting.

bound, and incentives are so low already that the marginal dilution is more than offset by the addition of new members. In this region, support is again increasing in regime size.

We now turn to the conspiracy  $G_1$  that is most likely to overthrow a perfect democracy, and this conspiracy will set  $g_1$  to maximize  $t(g_1) = \frac{s(g_1)}{1-g_1}$ . Note that the value of  $\bar{g}_1 : p(\bar{g}_1) = \underline{p} + a$  describes the maximum size for a conspiracy that provides sufficient incentives to attract traitors from a perfect democracy. Assuming that for sufficiently low levels of human capital  $h \simeq 0$  the size  $g_1^*$  of the challenging regime that maximizes its probability of success is interior, it follows that:<sup>8</sup>

**Proposition 3:** The size  $g_1^*$  of the challenging regime that is most likely to overthrow a perfect democracy is increasing in the level of human capital  $h$ , and may jump discretely to  $\bar{g}_1$  when  $h$  crosses a threshold  $\hat{h}$ .

Figure 10 graphs  $t(g_1)$  with  $\bar{g}_1 = 25\%$ ; higher curves are associated with higher levels of  $h$ . Again, there is a discrete jump from an interior optimum to  $g_1^* = \bar{g}_1$ . Figures 11 and 12 plot respectively the maximum probability of a successful coup against democracy, and the size of the associated conspiracy, as a function of  $h$ .

This endogenous group size discussion suggests that success-maximizing challenging regimes generally increases in size with the level of education. At low levels of education, status quo dictatorships are most effectively challenged by other small groups.

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<sup>8</sup> This requirement is equivalent to the formal condition that

$$\exists \hat{g}_1 \in (0, \bar{g}_1) : \frac{\hat{g}_1}{1-\hat{g}_1} [p(\hat{g}_1) + \underline{b} - c + \bar{\eta}] > \frac{\bar{g}_1}{1-\bar{g}_1} [p(\bar{g}_1) + \underline{b} - c + \bar{\eta}],$$

failing which the support-maximizing size of the challenger would be  $g_1^* = \bar{g}_1 \forall h \geq 0$ ; the latter case remains in fact mathematically consistent with Proposition 5, but becomes economically uninteresting.

For example, the battles of the French and English medieval monarchies generally featured one small group of nobles attempting to overthrow an existing king (the Wars of the Roses, for example). In less educated democracies, coups would involve only a small group of disgruntled opponents (a few colonels, for example). At higher levels of education, coup sizes against both dictatorship and democracies should increase. In Europe, the age of Revolutions is not really an age of increased instability, but an age where increasingly large groups took part in fights to overthrow the existing regime. Similarly, revolts against democracy, such as the Fascist takeover in Italy in the 1920s or the Nazi movement in Germany a decade later, became increasingly broad-based in societies with more education.

## **V. The Dynamics of Democracy [TO BE OVERHAULED.]**

We next ask whether the model can account for some historical patterns of the transitions to and from democracy. We initially focus on the great Western revolutions, but educated populations played a central role in establishing durable democracies in the “Third Wave” of democratizations in the last quarter of the 20<sup>th</sup> century as well (Huntington 1991, Papaioannou and Siourounis 2005).

### *The Transition to Democracy: The Great Western Revolutions*

The early revolutions (England 1640, America 1776, France 1789, 1830, 1848 and 1870, Germany 1848 and 1919, and Russia 1917), while clearly more complex than our model, nonetheless support its core predictions: the higher education of the populace raises the ability of a democratic movement both to upend a more restricted regime and to survive over time. Each of the revolutions ousted an existing autocratic regime, but only some managed to create a permanently more democratic one. Only America in 1776 and Germany in 1919 managed to generate regimes that were both essentially democratic and lasting for more than 10 years, and Germany’s democracy only lasted for 14 years. The English Revolution and the French Revolution of 1830 did bring about more inclusive

regimes, but hardly full democracies. What was the role of education in making these revolutions successful, and making the relatively more democratic regimes durable?

The English Revolution was not fought to create a democracy. Although neither the Cromwell regime nor the restoration were democratic by today's standards, the English revolution replaced a monarchy with a (temporarily) kingless regime using the rhetoric of popular sovereignty. The roots of the English Revolution lie at least as much in religion as in opposition to tyranny, and religion leads us to the education of the King's opponents. As Woolrych (2002, p. 254) writes:

Popular enthusiasm for the parliamentary cause was found mainly in towns where Puritanism was prevalent ... There were several reasons why Puritanism took root in urban communities. It was a religion of the book, and literacy was high in towns; many craftsmen could read the bible as they worked.

Woolrych also emphasizes the social cohesion of these towns ("towns and cities were specially close communities"), which surely encouraged participation. The soldiers of the uprising were well educated, and motivated by ideas they felt were worth dying for. The discipline of Cromwell's New Model Army was legendary for its time, and probably made possible by the rise of literacy that accompanied Protestantism.

But while 17<sup>th</sup> century English education seems to have been sufficiently common to support a broad based popular revolution, it was not powerful enough to protect a kingless parliamentary regime. Initiating a model that would recur often over the next 350 years, an initially broad revolutionary coalition was replaced in a coup by a more dictatorial alternative. In the 1640s, England had enough human capital to oust a king, but not enough to create a democracy.

The role of education is also apparent in the success of the American Revolution. Its leaders were astonishingly literate, and fashioned a compelling republican ideology to justify their rebellion (Bailyn, 1967). Particularly in New York and Boston, well-educated (for the era) city residents organized in opposition to "tyranny" (Nash, 1979).

Social organization was critical and education provided the basis for community coherence and eventually military discipline. Moreover, as we argue below, the educated and politically-engaged populace saved the United States from executive aggrandizement, and allowed the country to stay democratic for more than two centuries.

The four French revolutions between 1789 and 1870 had different outcomes. All four successfully deposed the incumbent ruler, but only in 1871 did the revolution lead to a permanent republic. The revolutions of 1789 and 1848 initially entailed more democratic regimes, but these regimes failed to withstand Bonapartist moves towards autocracy. Just as in England, during these earlier periods, there were enough educated citizens to topple a king, but not enough to protect a democracy from a counter-coup.

Just as in the case of the British and American revolutions, human capital was an important contributor to the rise of democratic factions. The first French revolution had a strong intellectual ideology and a political base among urban craftsmen who, as in England, were more literate and educated than their agrarian ancestors. These groups were able to organize to form communes or storm the Bastille. A key element in the success of 1789 was the military's loss of willingness to fire on civilian protesters. This may well have had to do with many soldiers' indoctrination in the ideals of fraternity.

The German revolutions of 1848 and 1919 show a common reliance on human capital. They also show that establishing a democratic regime required the much higher human capital level of 1919. In 1848, Germany participated in the common wave of revolutions that swept Europe, and unsurprisingly "if the revolution had a core, it was the young educated elite" (Randers-Pehrson, 1999, p. 145). The rebels took control of western Germany, Vienna, and Berlin. Everywhere, the revolutionaries were able to force concessions (Metternich resigned, the King of Bavaria abdicated in favor of his son, a liberal ministry was appointed in Berlin, and a national assembly was established in Frankfurt). The increasingly educated German people organized and effectively paralyzed their governments. But as in England 200 years earlier, as we discuss in the next section, the forces for democracy were not yet able to consolidate their success.

Finally, Russia in 1917 shows both how education helps craft support for a revolution and how its lack allows that revolution to be subverted by a non-democratic cabal. Russia was among the least educated western countries in 1917, and, as the model predicts, it was also the least democratic. The revolution succeeded only because the Russian army was in complete disarray after disastrous events in the war against Germany. The urban uprisings that overthrew the Czar were led by Russia's best educated groups. Given the lack of education in Russia, we should not be surprised that a small, highly incentivized group of Bolsheviks found it relatively easy to subvert the more democratic November republic.

### *The Defense of Democracy*

Is education as important in protecting democracy as it is in fostering democratic uprisings? Democracies are typically subverted in one of three ways: insider coups, executive aggrandizement, and outsider takeovers. In insider coups, current office-holders (generals, ministers) oust the incumbent executive and replace the democracy with a more dictatorial alternative. Since the first Napoleon, coups have often been led by generals with direct control of military resources, but not of the civilian resources actually needed to operate the government. Executive aggrandizement occurs when the current chief executive uses a combination of legal and quasi-legal means to turn his limited role in the democracy into a dictatorship. Examples include Napoleon III and Hitler. Often, coups are publicly justified as a means of stopping such aggrandizement (as in Chile in 1973 or in Venezuela in 2002). Finally, some democracies are toppled by attacks from outsiders. In these cases, the defense of democracy relies on the formal powers of government, not private political involvement. We focus on the defense of democracy against insider coups and executive aggrandizement.

The puzzle of military coups is not why they occasionally succeed, but rather why they fail. After all, the modern military has such an overwhelming superiority in physical force that it is hard to see why they do not always succeed, and, if so, why do they not always intervene. In pre-modern governments, the political head of the country

traditionally led the military as well. Until the 17<sup>th</sup> century, it was not unusual for heads of state to ride at the front of their troops. Even modern civilian dictators (Hitler, Stalin, Napoleon III) often lead the armies. All this merely recognizes the extraordinary power of the military to subvert a civilian government.

Huntington (1957) and Finer (1988) discuss two major barriers to military coups: lack of military cohesion and an inability to govern after the coup. Lack of military cohesion operates at several levels. At the level of the leaders, competition among generals creates a risk that a rival general turns in the conspiracy. At the level of the enlisted men, the refusal to fight against civilians is the traditional barrier to using the military internally. This unwillingness to fire on fellow countrymen is itself a product of socialization. It means that non-violent resistance can be effective against enlisted men with scruples.

Even if a military leader believes he can engineer a coup, he must be sure that he can govern afterwards. Running a government requires the cooperation of civilians in both public and private sectors. While one can try to man every factory, mine and government office with soldiers, military professionalism is unlikely to let this work (Huntington 1957). Dedicated civilian opposition can deter or derail a coup either during its initial stages, or gradually through a refusal of civilians to cooperate with the military leaders. Historically, civilian opposition to a coup has hinged on the level of education.

We have already mentioned how during the English and French Revolutions and in Germany in 1848, there was enough education to mount a democratic revolution but not enough to preserve democracy against a dictatorial coup. In 1848, after making initial concessions, the King of Prussia issued a new more autocratic constitution and the Frankfurt assembly passed into irrelevance. The Austrian emperor gave Metternich's job to the equally undemocratic Prince zu Schwarzenberg. In response, "there were popular revolts in many places, simultaneously or in quick succession; in Saxony, in the Prussian Rhineland, in Baden and in the Bavarian Palatinate" (Mann, 1957, p. 111). It is no surprise that popular uprisings were located in the best educated areas of Germany, but

since these uprisings were localized, they were eventually defeated by the dictators, with their highly incentivized military supporters in 1848.

But 71 years later, when a democratic government was again established through a popular revolution, greater levels of education and organization enabled the German left to protect democracy against counter-revolution. At the end of World War I, with his army in disarray, the Kaiser was toppled and replaced by the democratic Weimar Republic. In 1920 Wolfgang Kapp, a journalist, staged the Kapp Putsch aimed at replacing democracy with dictatorship. The coup was actually led by General Luttwitz, who brought 12,000 Freikorps soldiers into Berlin. The German military refused to intervene; General von Seeckt famously declared “Reichswehr does not shoot on reichswehr.” The Putschists took control of Berlin and President Friedrich Ebert had to flee. The Putsch was ultimately defeated not by guns, but because Ebert called a general strike. The strike paralyzed the country, and after five days the Putsch collapsed.

The German labor movement displayed the same discipline and willingness to fight for democracy that it did earlier in the wake of the Spartacist takeover of Berlin. Tilly, Tilly and Tilly (1975) describe how the disorganized peasant uprisings of the 1840s became transformed into “massive, disciplined and nonviolent acts of protest” by 1910. The growth of the labor movement owes much to the rise in German literacy, urbanization (which facilitated coordination), and the growth of educated elites who chose to lead it. Moreover, the leadership of this organized group included well educated men like Ebert who were skilled in using civilian forces to stop military power.

The French revolutions of 1789 and 1848 toppled monarchs and established democracies, but during those earlier periods education was not high enough to bring out enough civilians ready to fight Bonapartism. The Revolution of 1871 could have easily led to a military dictatorship, just as its predecessors in 1789 and 1848, but it did not. The pro-democratic groups were far better organized and their supporters had far more human capital than did comparable groups in the 1790s. MacMahon’s attempts at executive aggrandizement were checked by the republican alliance of Gambetta and Thiers. In

1889, the brief enthusiasm for General Boulanger was also stopped by the supporters of the republic. By this time, the spread of an educated civilian bureaucracy and a well-educated populace tired of men on horseback meant that democracy had much stronger supporters than it did in the late 18<sup>th</sup> century.

Even as late as 1961, the Algerian Generals Coup showed that in France a military coup was still conceivable, but civic engagement on the part of the educated French doomed a military takeover. This coup started in April 1961, when four generals seized control of the city of Algiers, and “at any moment skyborne troops might invade Paris” (Finer, 1988, p. 86). Like Ebert before him, President DeGaulle called for civilian opposition to this potential armed takeover. Civilians followed DeGaulle in droves: “the authorities began arming a civilian Home guard ...the government began to form a Force of Republican guards and reservists, 10,000 strong..... ten million workers struck for one hour throughout metropolitan France ... “ (Finer, 1988, p. 87). To the extent that democracy in France was safe, it was because the civilians were capable and willing to fight for the French democracy. This capacity and willingness had much to do with two centuries of French education after Napoleon’s coup.

One view is that the armed coups in France and Germany failed because of a tradition of civilian government, not education. While it is far from clear that Germany between 1871 and 1914 really established such strong civilian institutions – at the end of the first World War the German Empire was a pure military dictatorship – the relative unimportance of long run traditions becomes clearer in the case of the Spanish coup of 1981. Spain had a long-run military dictatorship and no tradition of democracy. All the progress towards democracy had occurred in a narrow five year window between Franco’s death in 1975 and 1981. The 1981 coup began in Valencia, and Lieutenant Colonel Tejero succeeded in seizing the parliament in Madrid. That coup failed when King Juan Carlos (like Ebert and DeGaulle) denounced it, and summoned the educated civilian bureaucracy to replace the parliament. During 1930s, when Spain was less educated, the Republic was unable to stop Franco’s coup.

Perhaps the most important failed coup of the past 20 years was the 1991 Soviet coup against Gorbachev, led by both generals and Kremlin insiders. In 1917, Russia had lacked sufficient educated elites to defend its nascent democracy against the Bolsheviks. Seventy-four years later, Russia's educated elites were more effective. At the start of the 1991 coup, Gorbachev was arrested. Opposition to the coup was led by Russian President Boris Yeltsin, who denounced the Putschists from the top of a tank. As Varney and Martin (2000) detail, there was a remarkable show of civilian support for Yeltsin and against the coup. Printing workers at Izvestia refused to print the news unless it contained Yeltsin's declaration. A caravan of water trucks blocked the entry of tanks into Palace Square in Leningrad. Civilian strikes broke out throughout the country. The Soviet Union had no tradition of democratic institutions, but the Soviets had invested heavily in education. When the time came to oppose a military dictatorship, enough Russians were willing and able to organize to fight for democracy.

Finally, throughout most of the post-war period, civilian response against military coups in Latin America was generally weak, as we might expect given the low levels of education. But by 2002, the attempted coup against Hugo Chavez in Venezuela shows that even in Latin America, rising education levels have made military coups more difficult. Partially in response to Chavez's own executive aggrandizement, a group of military and business leaders seized Chavez and took total control of the government. Chavez's supporters took to the streets. Ultimately, more than 100,000 people surrounded the presidential palace, and took control of the television stations. In the 1960s, agrarian populations of Latin American countries typically responded passively to military takeovers. By 2002, strong civilian opposition faced down the military coup and Chavez survived.

Organized opposition stopped a coup deposing Hugo Chavez in Venezuela in 2002, in part due to rising education levels. These increased the number of people willing and able to oppose the coup, but also willing and able to oppose Chavez's own executive aggrandizement. Hundreds of thousands of demonstrators marched against what they

saw as his disregard for Venezuela's democratic traditions. Chavez has been both helped and hurt by the rise of education in his own country.

The case of Hugo Chavez makes it clear that democracy is not only at risk from coups or revolutions, but also from the executive aggrandizement of democratically elected leaders. Such aggrandizement can occur quickly or more slowly through a gradual corruption of the democratic process. Hitler is perhaps the most famous example of a totalitarian dictator who initially came to power by winning an election. Since the executive has both the incentives and the resources to aggrandize, fighting his aggrandizement is difficult. Much of the current worries about the stability of democracy in Venezuela, Haiti or Russia hinges on fears of executive aggrandizement.

The rise of dictatorship between world wars was accomplished in Germany, Italy and Austria through executive aggrandizement, rather than through coups or revolutions. In all three places, leaders who came to power through constitutional means (Hitler, Mussolini, and Dollfuss) extended their power and gradually became dictators. In Hungary, Julius Gombos intended to follow the same path, but died before he could carry out his plan. In all these cases, opposition was significant but not strong enough to protect democracy.

U.S. history is filled with examples of Presidents seeking to enlarge their own powers, and of political opponents who fought to limit such aggrandizement. During the Jeffersonian era, the Federalists fought hard to limit increases in executive power, and John Marshall's reputation as a brilliant jurist hinges in part on his skills in checking Jefferson. During the Jackson administration, the Whig party was named to remind voters of the risks of Jacksonian "tyranny." In the 1930s, Franklin D. Roosevelt's attempt to increase his authority was checked by Republicans, Southern Democrats and the Supreme Court. Nixon's "imperial" presidency was brought to an end by intrepid reporters and their spies in the FBI. At all stages in this process, an abundant supply of well-educated defenders of democracy in the U.S. was critical to the survival of the democratic regime.

In the past 150 years, France has had at least three moments of significant executive aggrandizement. Most recently, DeGaulle's imperial presidency was eventually ended by student uprisings in 1968. Nowhere is the power of education in facilitating organized resistance more obvious than the in the capacity of students to march.

Student rioted against authority at Oxford, Bologna, and Paris even in the Middle Ages. Martin Luther found the most immediate intense support from the students in Wittenberg and other German universities. Both Engels and Lenin complained that students were unwilling to subject themselves to the leadership of the revolutionary – and not so democratic – elites. More recently, student demonstrations played a role in the overthrow of Peron in Argentina in 1955, the downfall of Perez Jimenez in Venezuela in 1958, the resistance to Diem in Vietnam in 1963, the resignation of the Kishi government in Japan in 1960, the anti-Sukarno movement in Indonesia in 1966, the downfall of Ayub Khan in Pakistan in 1969, the October demonstration in Poland in 1956, the Hungarian Revolution in 1956, the Prague Spring in 1968, and the toppling of the Rhee government in Korea in 1966. The Tiannamen student uprising of 1989 failed to depose the Communist Party, perhaps because the students got little support in generally uneducated China and were massacred by the troops. Most recently, peaceful demonstrations in which students played a key part helped save democracy in Ukraine against the aggrandizement by an ex-President who stole the election.

## **VI. Conclusion**

The correlation between education and democracy is clear. The reason for this correlation is not. In this paper, we offer an explanation for the correlation.

Our explanation hinges on the connection between education and the costs and benefits of political engagement. Schools socialize young people and political involvement is one form of socialization; a vast body of evidence shows a positive connection between

education and civic engagement. We formally model education as raising the benefits of political action when individuals choose to support a more or less democratic regime. In this model, democratic regimes offer weak incentives to a wide base of potential supporters, while dictatorships offer strong incentives to a much narrower base. Education increases the society-wide support for democracy because democracy relies on people with high participation benefits for its support. We show that better educated nations are more likely both to preserve democracy and to protect it from coups.

These core predictions of the model appear to fit well with the historical evidence. Democratic revolutions against dictators became more common as populations became more educated. Democracies were better able to stave off dictatorial coups as human capital rose. The history of coups and counter-coups shows clearly that educated, civically engaged masses have been critical in stopping military takeovers.

Our initial empirical results offer scant hope for the success of democracies transplanted in highly uneducated countries. Among the countries for which we have data, only four countries with education levels like those of Afghanistan and Haiti have had democracies for twenty years or more (Botswana, India, Papua New Guinea and Venezuela). We estimate that the probability that democracies imposed in these countries will turn into dictatorships within 20 years is over 50 percent. As Iraq is better educated, the chance of democracy surviving is higher. Still, the odds are far from one.

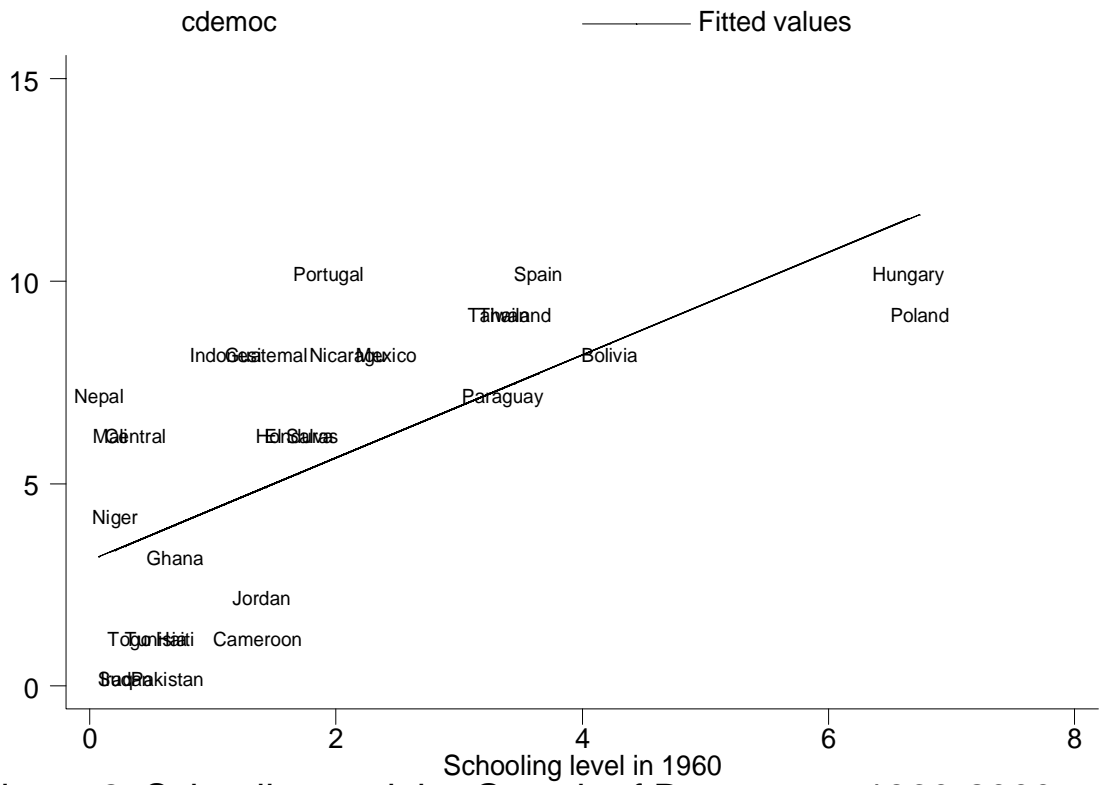
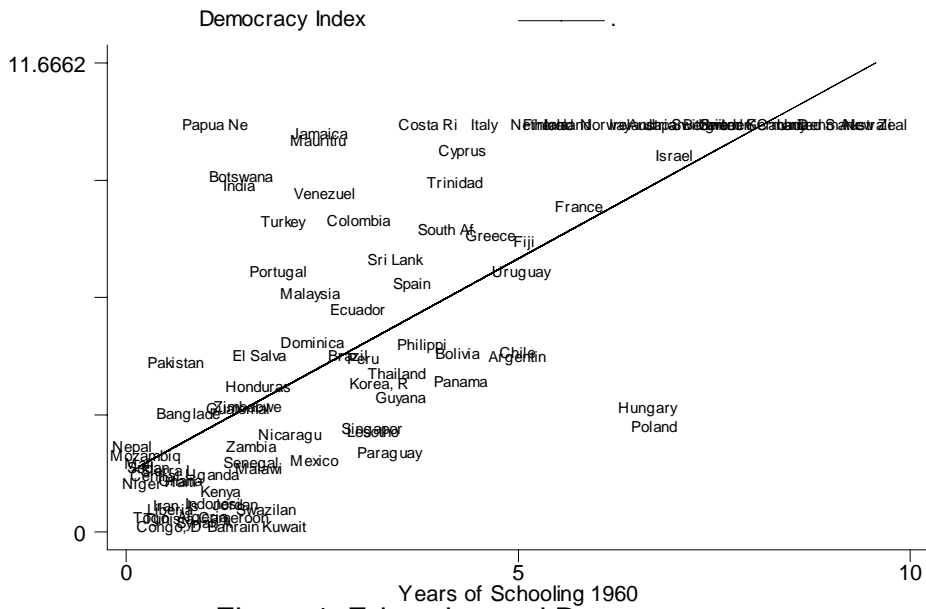
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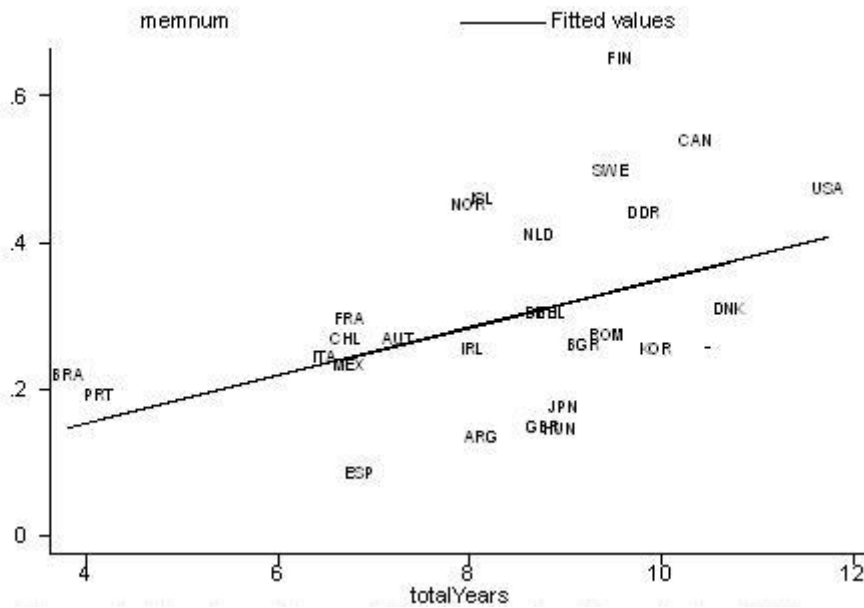
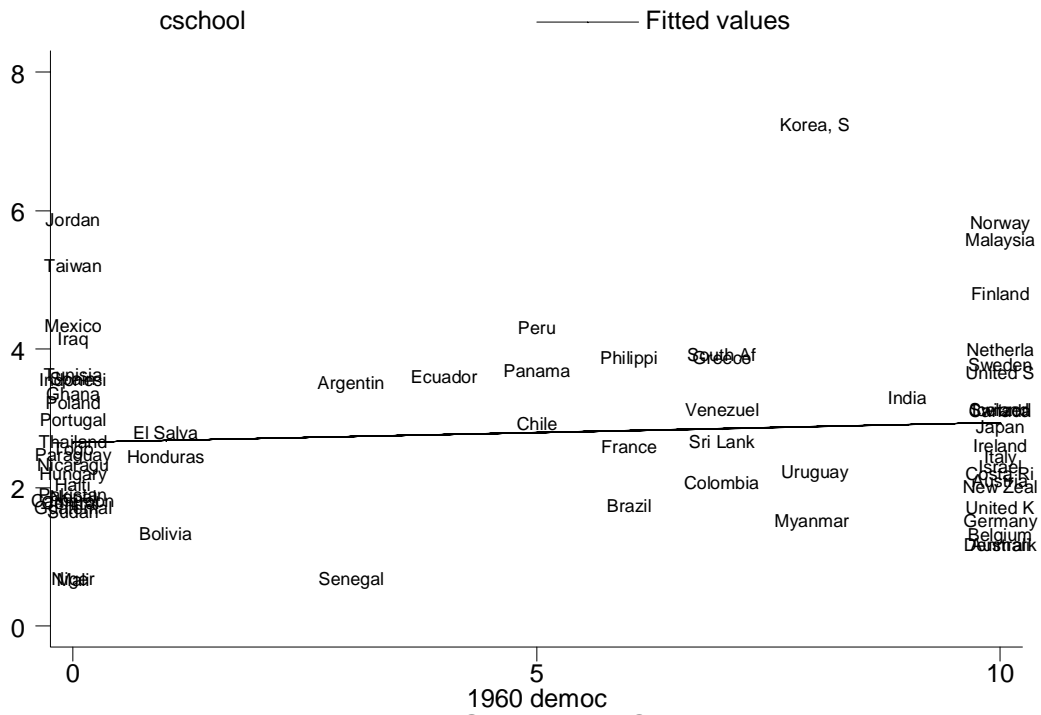
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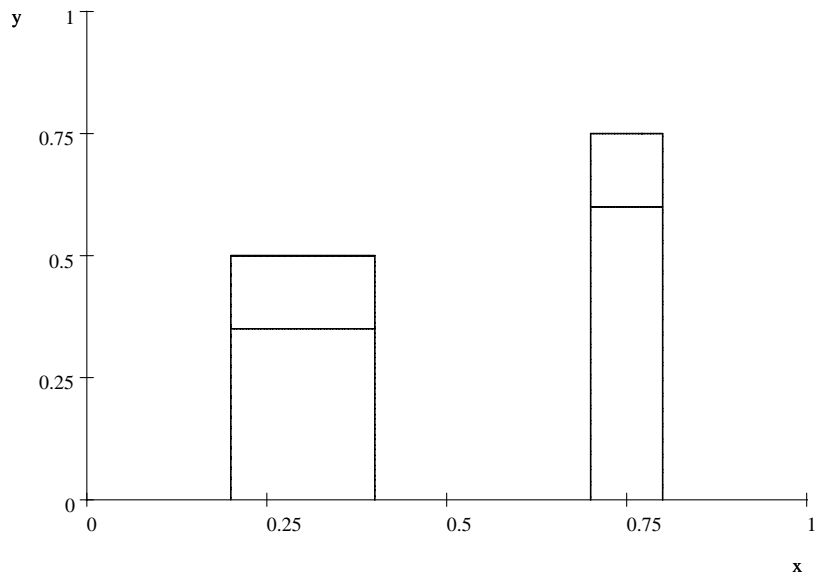


Figure 5: Support for two regimes as a function of  $h$

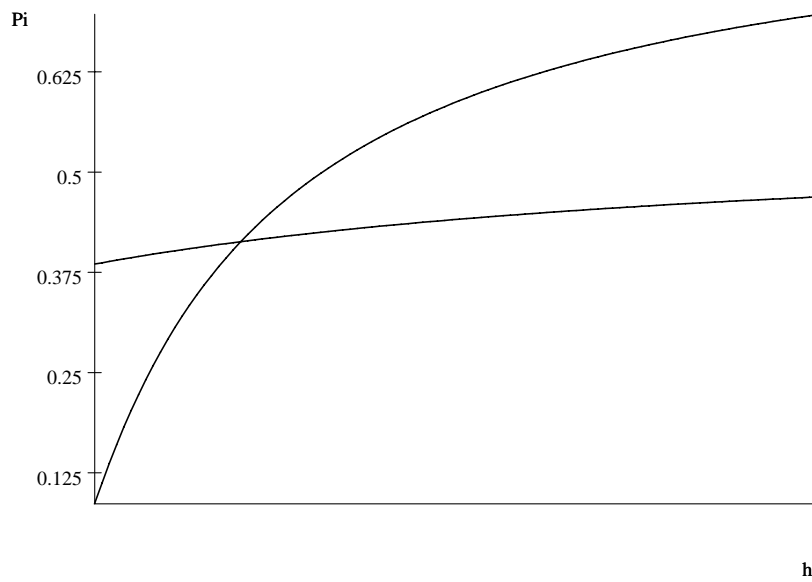


Figure 6: Probability of success for a more democratic regime

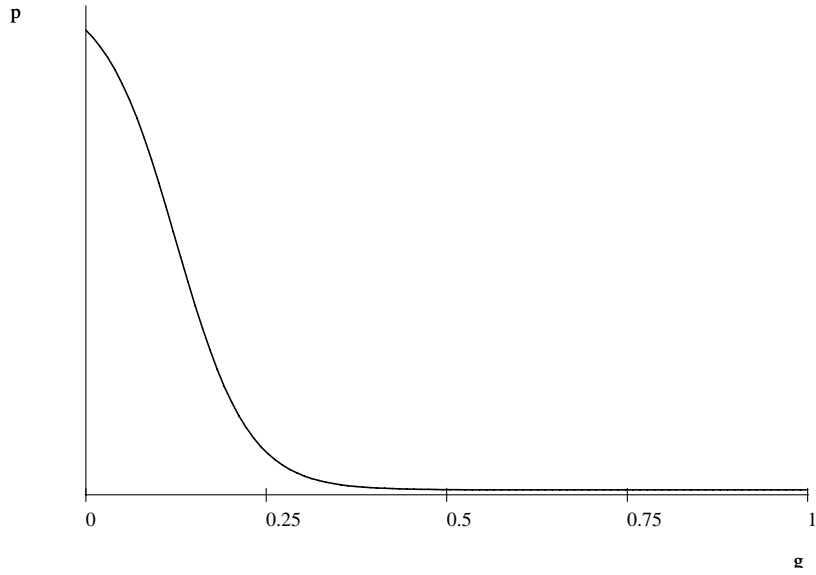


Figure 7: An example of cost function with  $p' < 0$  and  $p''' > 0$

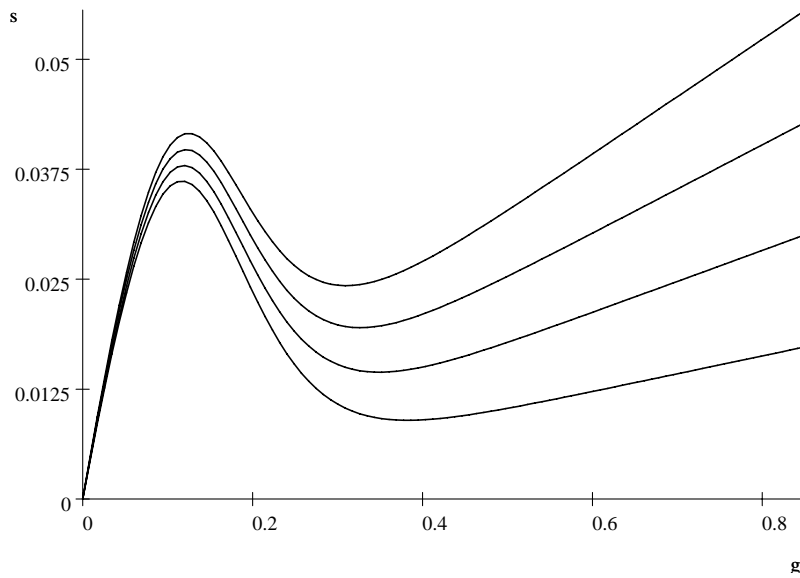


Figure 8: Support for a challenger to an oligarchy  $G : g = 0.15$

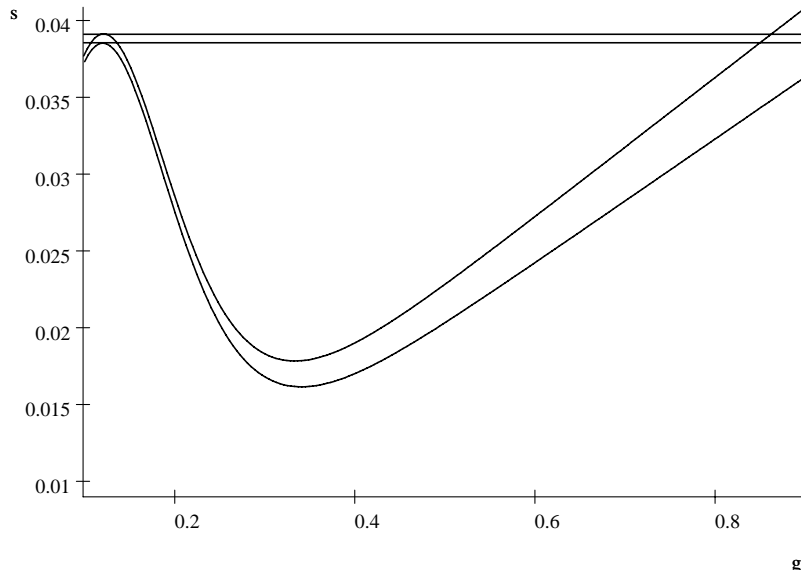


Figure 9: Discrete jump in  $g^*$  as  $h$  crosses the threshold

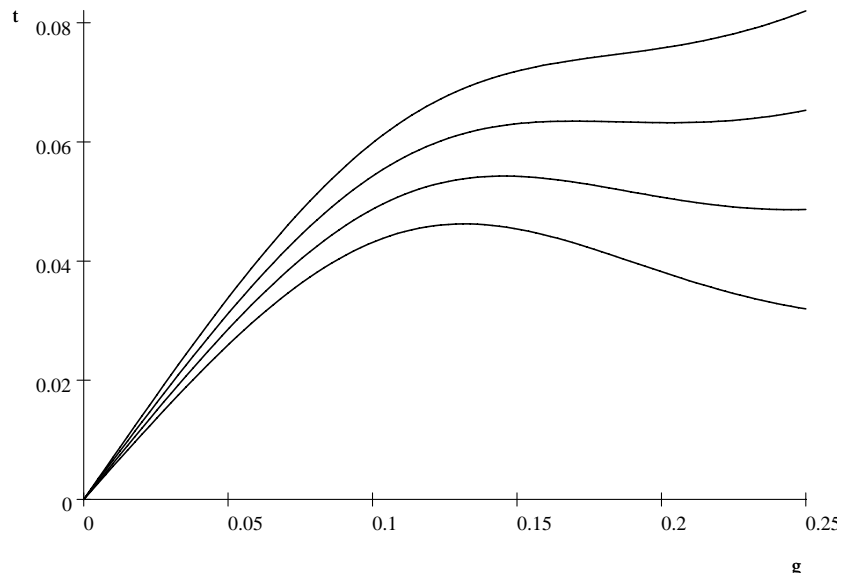


Figure 10: Support for a coup against perfect democracy

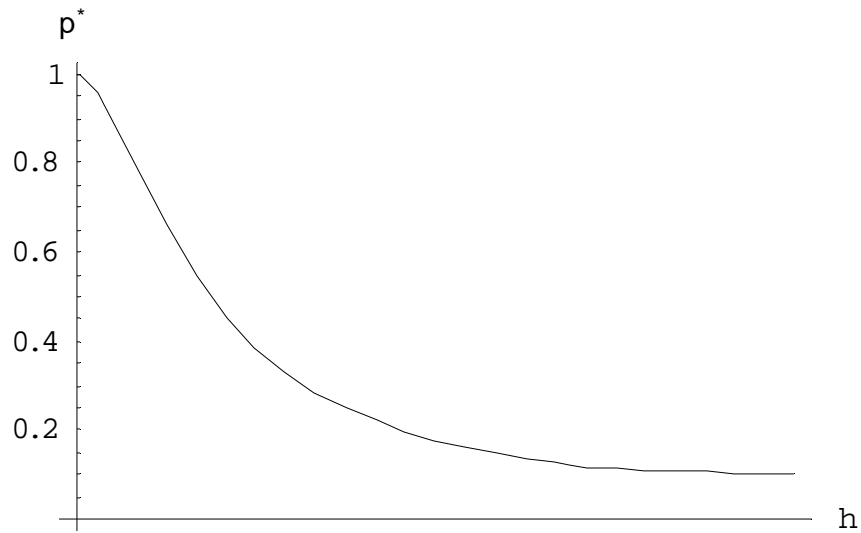


Figure 11: Maximum probability of overthrowing democracy

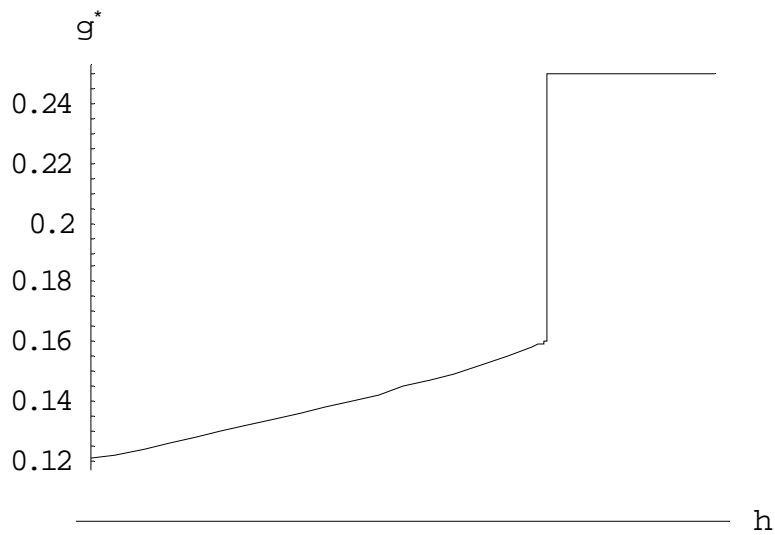


Figure 12: Size of the most effective oligarchic coup

<b>Table 1a – The Stability of Democracy and Dictatorship in High Education Countries (&gt;5.0115)</b>					
Initial Year and Total countries	Number of Countries that are:	Number of Countries still after 10 years:	Number of Countries still after 20 years:	Number of Countries still after 30 years:	Number of Countries still after 40 years:
1960: Democracy <b>22</b> Dictatorship	20 2	20 2	19 2	19 0	19 0
1970 Democracy <b>26</b> Dictatorship	22 4	20 2	20 0	20 0	
1980 Democracy <b>34</b> Dictatorship	25 9	25 1	25 0		
1990 Democracy <b>46</b> Dictatorship	38 8	37 3			

<b>Table 1b – The Stability of Democracy and Dictatorship in Intermediate Education Countries (2.6785-5.0115)</b>					
Initial Year and Total countries	Number of Countries that are:	Number of Countries still after 10 years:	Number of Countries still after 20 years:	Number of Countries still after 30 years:	Number of Countries still after 40 years:
1960: Democracy <b>17</b> Dictatorship	11 6	6 6	5 4	5 3	5 0
1970 Democracy <b>19</b> Dictatorship	7 12	7 10	7 5	7 1	
1980 Democracy <b>24</b> Dictatorship	9 15	9 12	8 6		
1990 Democracy <b>27</b> Dictatorship	13 14	13 11			

<b>Table 1c – The Stability of Democracy and Dictatorship in Low Education Countries (&lt; 2.6785)</b>					
Initial Year and Total countries	Number of Countries that are:	Number of Countries still after 10 years:	Number of Countries still after 20 years:	Number of Countries still after 30 years:	Number of Countries still after 40 years:
1960: Democracy <b>18</b> Dictatorship	4 14	2 13	2 13	2 11	2 5
1970 Democracy <b>21</b> Dictatorship	3 18	1 18	1 16	1 9	
1980 Democracy <b>24</b> Dictatorship	4 20	3 17	2 9		
1990 Democracy <b>16</b> Dictatorship	5 11	2 4			

<b>Table 2 - The Effect of Education on Democracy, 1865-2000</b>							
Independent Variable	1960-2000 Only	1960-2000 Only	1960-2000 Only	1865-2000	1865-2000	1865-2000 with no country clustering	1865-2000 with country clustering
Secondary Coefficient	-	0.181		0.290	-	0.238	0.499
		(0.053)		(0.046)		(0.496)	(0.136)
University Coefficient	-	-	0.633	-	0.850	0.532	1.825
			(0.196)		(0.172)	(0.183)	(0.430)
Years of Schooling	-0.237	-	-	-	-	-	-
	(0.150)						
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	No
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Countries	101	132	132	133	133	133	133
Years	9	9	9	25	25	25	25
Observations	777	691	691	1316	1316	1316	1316
R-Squared	0.799	0.879	0.879	0.788	0.786	0.790	0.210
<p>Dependent variable is the democracy score from: Jagers, Keither and Monty G. Marshall (2003). "Polity IV Project." Center for International Development and Conflict Management, University of Maryland. Online at <a href="http://www.cidcm.umd.edu/inscr/polity/index.htm">http://www.cidcm.umd.edu/inscr/polity/index.htm</a>.</p> <p>Average Years of Schooling data (column 1) from: Barro, Robert J. and Jong-Wha Lee, International Data on Educational Attainment: Updates and Implications. Source: Barro and Lee (2000) Data posted on <a href="http://www.cid.harvard.edu/ciddata/ciddata.html">http://www.cid.harvard.edu/ciddata/ciddata.html</a>.</p> <p>Enrollment data (columns 2-7) from: Banks, Arthur S (2004). <i>Cross National Time-Series Data Archive</i>. CD-ROM. Binghamton, New York: Arthur S. Banks.</p> <p>Data are every 5 years from 1865 to 2000 with the exception of 1915, 1940, and 1945, for which data are unavailable.</p>							

**Table 3: Social Engagement and Education**

	<b>Attended church or other place of worship</b>	<b>Attended a class or seminar</b>	<b>Worked on a community project</b>	<b>Wrote a letter to the editor</b>	<b>Contacted a public official</b>	<b>Are you a registered voter?</b>	<b>Gave someone the finger while driving</b>
<b>Dependent variable mean</b>	22.7	4.8	2.4	0.5	2.1	88%	2.1
<b>High School grad</b>	0.1794 [12.22]**	0.181 [7.01]**	0.1209 [8.69]**	0.0353 [1.88]	0.1044 [2.15]*	0.4673 [7.89]**	-0.1413 [3.01]**
<b>College grad</b>	0.1593 [14.45]**	0.4011 [23.18]**	0.1997 [19.10]**	0.0865 [6.50]**	0.1828 [4.65]**	0.1632 [4.63]**	-0.159 [5.84]**
<b>Survey year</b>	-0.018 [14.38]**	-0.0169 [3.27]**	-0.0069 [5.85]**	0.0002 [0.10]			0.04 [1.69]
<b>Female</b>	0.2515 [27.66]**	0.0282 [1.92]	0.0733 [8.51]**	0.005 [0.45]	-0.1546 [4.77]**	0.1167 [3.77]**	-0.2101 [8.74]**
<b>Age</b>	0.0103 [36.12]**	-0.0111 [24.02]**	0.0056 [20.55]**	0.0016 [4.66]**	0.0027 [2.50]*	0.0119 [12.18]**	-0.0122 [16.34]**
<b>Black</b>	0.0983 [4.61]**	-0.0549 [1.84]	0.0095 [0.47]	0.0138 [0.57]	-0.1619 [1.64]	0.1167 [2.10]*	
<b>Asian</b>	-0.303 [5.61]**	0.1815 [2.74]**	-0.0641 [1.25]	0.0607 [1.06]	0.0778 [0.15]	-0.533 [4.61]**	
<b>Other</b>	-0.1549 [2.76]**	0.0918 [1.27]	0.0688 [1.29]	0.3124 [5.01]**	-0.1327 [0.46]	-0.0172 [0.12]	
<b>Log income in 2000 dollars</b>	0.02 [3.08]**	-0.0659 [6.17]**	0.052 [8.45]**	-0.0181 [2.29]*	0.0063 [0.20]	0.1299 [5.84]**	-0.0038 [0.22]
<b>Missing income data</b>	-0.0243 [1.04]	-0.0149 [0.48]	0.0085 [0.39]	0.0295 [1.14]	-0.1134 [0.83]	0.0164 [0.19]	0.0143 [0.27]
<b>Constant</b>	34.7132 [14.01]**	34.6147 [3.37]**	12.7943 [5.44]**	-0.4271 [0.09]	-0.2611 [0.85]	-2.4316 [10.15]**	-79.0522 [1.67]
<b>Observations</b>	47459	18888	47808	30710	3229	3617	6747
<b>R-squared</b>	0.05	0.07	0.02	0	0.02	0.08	0.05

Notes: Absolute value of t statistics in brackets. \* Indicated significance at 5%; \*\* Indicates significance at 1%. Data from DDB Needham