

POLITICAL ELITES, DEMOCRACY AND EDUCATION: THEORY AND EMPIRICS

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ABSTRACT

We develop a theoretical model to study the interaction of political elite's de facto power, democratization and education. We focus on the control of *de facto* political power as the driving force behind the elite's decision to subsidize or not subsidize education, and to support or not support democratization (political reform). Assuming a society where a small elite control de facto political power, our model tries to identify the conditions under which the elite support democracy and/or education. We find that under some conditions, the elite may overcompensate the loss of de jure power (as a result of political reform or democratization) by investing too much in de facto power (as in Acemoglu and Robinson, 2006) so that the probability to have de facto power is higher under democracy than under non-democracy. We show that depending on whether citizens' education has increasing or decreasing returns, the elite may or may not support education subsidy under democracy. We use panel data from a large group of African countries and test this prediction at the macro level. The results we obtain offer useful insights into the differences we observe in the elite's preferences for investing in the education of the masses in countries at comparable levels of democratization; and the differences we note in levels of democracy across countries with comparable educational levels.

Keywords: Institutions, democracy, education, political elite, de facto political power

JEL: D7, I2, O17

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1. INTRODUCTION

There exists significant theoretical and empirical research on the role of human capital in growth and development (e.g., Romer, 1986; Lucas, 1988; Barro, 1991 and 1996, Benhabib and Spiegel, 1994; Mincer, 1996; Krueger and Lindahl, 2001; Baliamoune-Lutz, 2009a). Education indicators, such as primary and secondary educational levels, average years of school attainment, or literacy rates, are often used as measures (or proxies) of human capital. Yet, mass education may be viewed as a threat to the political elite and is not widely supported in some parts of the world. Similarly, there is an important body of work in political science and economic literature on the statistical association between growth (or development) and democracy (e.g., Lipset, 1959; Przeworski and Limongi, 1993; Barro, 1996 and 1999; Minier, 1998; Durham, 1999; Londregan and Poole, 1996; Acemoglu et al., 2008; Fosu, 2008). While most of the early studies argue in favor of a positive correlation between democracy and income (or growth), more recent studies—Acemoglu et al. (2008) in particular—show that this association is not robust.

A growing literature on the interplay of political elite and education of the masses (and on the implications of this interplay for growth and income distribution) tries to model this relationship within a political economy context, where education is at the same time the engine of growth and a determinant of political participation (Perotti, 1993 and 1996; Galor and Zira, 1993; Saint-Paul and Verdier, 1993; Bourguignon and Verdier, 2000; Galiani et al., 2008). In an insightful paper, Bourguignon and Verdier (2000) study the dynamics of inequality, democratization, and development and explore the incentives for an educated oligarchy to subsidize the education of the poor and start a democratic transition. The authors identify circumstances under which the elite promote the endogenous emergence of a middle class for purely political economy reasons. Their model indicates that three possible situations could occur. A situation with complete democracy with two classes, rich and poor; a situation of oligarchy with two classes, rich and poor; and a situation where the country is partially democratized with three classes, rich, poor, and middle-class. Galiani et al. (2008) study the emergence of large-scale education systems by modeling the incentives that the economic elite could have to accept taxation destined to finance the education of credit-constrained

workers, and find that these incentives arise from the increased demand for human-capital-intensive services by high-income groups. Their model helps to explain why land-rich countries in Latin America (Argentina, for example) developed an extensive public education system and a sophisticated service sector, prior to developing a strong manufacturing sector.

During the past three decades or so, many developing countries undertook—albeit to different degrees—various political, institutional, and economic reforms. Yet, there is only a limited number of studies in the economic literature that have examined the role of the elite in pushing through policy and economic reforms. An interesting and simple theoretical model that explores this topic is Acemoglu and Robinson (2006), where the authors develop a static model to identify mechanisms that would allow an understanding of simultaneous change and persistence in institutions. The main result in Acemoglu and Robinson (2006) provides important insight into the interplay between democracy, *de facto* political power, and economic institutions. The authors show that elite’s investment in *de facto* power exactly offsets the additional *de jure* power (as a result of democracy) of citizens, so that the elite retain the power to control economic institutions and economic policies that favor the elite. Hence, economic institutions that favor the elite could persist even with democratization. In Acemoglu and Robinson (2008), the authors use a more elaborate model and note that this result is a special case of the more general case where the elite invest in *de facto* political power to partially or entirely offset the changes in *de jure* power resulting from political reform. They then use this special-case result as evidence indicating a pattern of invariance of economic institutions; and argue that “even though political institutions change along the equilibrium path, the stochastic distribution of economic outcomes remains invariant” (Acemoglu and Robinson, 2008:287).

In this paper, we develop a simple theoretical model that links the support for political reform by the elite to the preferences of the elite and their support for citizens’ education (mass education). Following Acemoglu and Robinson (2006), we focus on the control of *de facto* political power as the driving force behind the elite’s decision to subsidize or not subsidize education, and to support or not support democratization (political reform). Assuming a society where a small elite controls *de facto* political power, our model tries to identify the

conditions under which the elite support democracy and/or education. In addition, if we can identify different degrees of democracy, the model we develop in this paper should offer useful insights into the differences we observe in the elite's preferences for investing in mass education in countries at comparable levels of democratization; and the differences we note in levels of democracy across countries with comparable educational levels.

Our model differs from the one in Acemoglu and Robinson (2006) in two important ways. First, we assume that de facto political power can be generated from a general function. Since their main result (equation (11) in Acemoglu and Robinson's paper) assumes that de facto political power is generated linearly, it is interesting to explore how this result might change when we assume a more general functional form. We introduce this complication in the model in order to examine cases where the elite are more or less than linearly productive in retaining power. This leads to a case where the elite may end up with more de facto power in more de jure democracy. Second, we account for the elite's support of (or spending on) citizens' education. Higher levels of spending on education reduce the elite's rents directly and at the same time add to the rents through positive externalities on the elite's aggregate income, say through higher productivity in the productive sector (assuming the elite control this sector), but more education raises citizens' political participation and, thus, may increase de jure political power of the citizens (Bourguignon and Verdier, 2000; and Glaeser et al., 2007).

The main goal of the present paper is to contribute new insight into the interplay of education, democracy and elite's de facto political power. We first identify conditions under which the elite may overinvest in de facto political power so that the probability to have de facto power is higher under democracy than under non-democracy. This may lead to deterioration—not merely invariance—of economic institutions and economic policy, and could explain why growth may be even lower in early stages of democratization. Second, the model presents additional theoretical evidence consistent with the results in Bourguignon and Verdier (2000) in that the evidence indicates that we may have different outcomes depending on the interplay between political reform, de facto political power and citizens' education. In particular, more democracy may or may not lead to more support for the education of the masses. Finally,

using macro-level data from African countries, we test the proposition that mass education and democratization may not necessarily be positively correlated

The remainder of the paper is organized as follows. Section 2 introduces the static model and characterizes the model's equilibria, and derives propositions based on elite's decisions with regard to investing in de facto power, subsidizing citizens' education, and undertaking political reform (democratization). Section 3 summarizes the theoretical results and discusses their main implications. In Section 4, we provide preliminary empirical evidence on the association between democratization and education (controlling for a proxy for the elite) in Africa Section 5 concludes.

2. THE MODEL

We follow the characterization of society in Acemoglu and Robinson (2006). Society has two groups: A finite number (M) of the elite (e) and a continuum 1 of citizens (c). Since the elite are a minority group, they gain more from controlling de facto political power and they are more efficient in doing so (Mosca, 1939; Olson, 1965; Acemoglu and Robinson, 2008). We assume that only those who control de facto political power can control economic power. This implies that those who hold de facto political power are the only ones capable of setting up economic institutions in the country, including economic reforms (such as market regulation, financial liberalization, trade reform, and exchange rate liberalization).

We first describe how the de facto political power of an elite (P^e) member i is generated.

For all $\theta^i \geq 0$, let $g(\theta^i) > 0$, $g'(\theta^i) > 0$. The political power generating function $g(\theta^i)$ ¹ is defined as the increase in the de facto power of the elite as a result of the contribution θ^i (investing in activities that would increase de facto political power) of member i of the elite. Thus,

$$P^e = \phi \sum_{i \in \mathcal{E}} g(\theta^i) \tag{1}$$

¹ Note that this paper presents an equation for the de facto political power of the elite that is different from that in Acemoglu and Robinson (2006 and 2008) in that we assume that the political power is generated by a general function of investment (θ) in power. Obviously, $g(\theta) = \theta$ is a sub-case of this general case.

where $(\phi > 0)$.

Next, let E represent the elite's spending on education of the citizens. We assume that the citizens do not undertake activities to increase their de facto power so that θ for the citizens is equal to zero. The total political power of the citizen P^c is given by the following equation.

$$P^c = \omega + E + \eta I(S = D) \quad (2)$$

Following Acemoglu and Robinson (2006), we define ω as a random variable with a continuous distribution function $F(\cdot)$ and density function $f(\cdot)$ which is strictly decreasing ($f'(\cdot) < 0$). $I(S = D)$ is an indicator function taking the value of 1 when the state of the regime is democracy. η is the extent of the political power of the citizens that is derived from democracy, and it is strictly positive ($\eta > 0$). Equation (2) shows that the citizens can increase their political power from three different sources. The citizens may manage to solve the collective action problem and come to a consensus that might allow them to have greater de facto political power (with ω having a positive effect). Second, more spending by the elite on education (E) enhances citizens' political participation. Third, more democracy (a higher value for η) implies more (de jure) political power for citizens.

The description of the game stages is as follows. In stage 1, η is set. In stage 2, the elite chooses θ^i and E simultaneously. In stage 3, ω will be realized. The game is solved by backward induction to result in a subgame perfect equilibrium.

In regime S (where S refers to the state of the regime, democracy or non-democracy), the power of the elite is given by

$$P^e(\theta^i, \{\theta^j(S)\}_{j \in \emptyset, j \neq i} | S) = \phi \sum_{j \in \emptyset, j \neq i} \theta^j(S) + g(\theta^i) \quad (3)$$

The elite will have de facto political power under non-democracy if

$$P^e(\theta^i, \{\theta^j(S)\}_{j \in \varphi, j \neq i} | S) \geq \omega + E + \eta I(S = D) \quad (4)$$

Thus, given $S = N$, the elite member i will choose θ^i to maximize the following function

$$-\theta^i + F(\phi(\sum_{j \in \varphi, j \neq i} g(\theta^j(N)) + g(\theta^i(N))) - E)R^i(E) \quad (5)$$

where the second term ($F(\cdot)$) represents the probability of the elite member having de facto political power greater than the power of the citizens after taking into consideration spending on (subsidy of) education of the citizens. Holding economic power yields returns R to the elite.

Solving for the first-order condition with respect to θ^i , we get

$$-1 + \phi f(\phi(\sum_{j \in \varphi, j \neq i} g(\theta^j(N)) + g(\theta^i(N))) - E)R^i(E)g'(\theta^i(N)) \leq 0 \quad (6)$$

and (with complementary slackness)
$$\sum_{i \in \varphi} \theta^i(N) \geq 0$$

Under non-democracy ($S = N$) and given the assumptions and conditions introduced earlier, the first-order condition leads to the optimal level of investing in de facto political power such that

$$\phi f(\phi(\sum_{j \in \varphi, j \neq i} g(\theta^j(N)) + g(\theta^i(N))) - E)R^i(E) = \frac{1}{g'(\theta^i(N))} \quad (7)$$

Using the same approach, we derive the conditions under which investing in de facto political power is the optimal decision (for the elite) assuming democracy ($S = D$); i.e., taking into account the extent of citizens' de jure political power (η) which is derived from democracy. The elite member i will choose θ^i to maximize the following function

$$-\theta^i + F(\phi(\sum_{j \in \varphi, j \neq i} g(\theta^j(D)) + g(\theta^i(D))) - \eta - E)R^i(E) \quad (8)$$

Solving for the first-order condition with respect to θ^i , we get

$$-1 + \phi f(\phi(\sum_{j \in \varphi, j \neq i} g(\theta^j(D)) + g(\theta^i(D))) - \eta - E) R^i(E) g'(\theta^i(D)) \leq 0 \quad (9)$$

and (with complementary slackness)
$$\sum_{i \in \varphi} \theta^i(D) \geq 0$$

Thus,

$$\phi f(\phi(\sum_{j \in \varphi, j \neq i} g(\theta^j(D)) + g(\theta^i(D))) - \eta - E) R^i(E) = \frac{1}{g'(\theta^i(D))} \quad (10)$$

(7) and (10) imply that

$$\frac{f(\phi(\sum_{j \in \varphi, j \neq i} g(\theta^j(N)) + g(\theta^i(N))) - E)}{f(\phi(\sum_{j \in \varphi, j \neq i} g(\theta^j(D)) + g(\theta^i(D))) - \eta - E)} = \frac{g'(\theta^i(D))}{g'(\theta^i(N))} \quad (11)$$

2.1. Political power

In this section, we try to identify the conditions under which the elite will decide to invest more in de facto political power (i.e., incur positive amounts of the cost θ). An interesting question that is worth exploring is whether the elite's investment in de facto political power will be only up to the point where it would enable the elite to offset the loss in de jure political power that results from democracy or whether the elite might *overcompensate* for this loss. The latter may help explain why a country may have weaker (lower quality) economic institutions under democracy relative to their level under non-democracy. In such cases, the elite's overcompensation for the loss of the jure power would lead to greater inefficiency under democracy (as a result of the elite overinvesting in de facto political power) than would occur under the model in Acemoglu and Robinson (2006) where the elite invests in θ in order to *offset* the loss in the jure political power and so such society experiences institutional persistence. Thus, our model allows for the possibility of deterioration—not just persistence—of economic institutions.

$$\text{Let } F(N) = F(\phi(\sum_{j \in \varphi, j \neq i} g(\theta^j(N)) + g(\theta^i(N))) - E); F(D) = F(\phi(\sum_{j \in \varphi, j \neq i} g(\theta^j(D)) + g(\theta^i(D))) - \eta - E)$$

Proposition 1. It follows from Equation (11) that

- a) if $g''(\cdot) = 0$, $\theta^i(D) > \theta^i(N)$ and $F(D) = F(N)$.
- b) if $g''(\cdot) < 0$, $\theta^i(D) > \theta^i(N)$ and $F(D) < F(N)$.

Proof:

See Appendix A.

(a) and (b) imply that under democracy, the elite will invest in θ to try to maintain de facto political power. These results are similar to those reported in equation (11) in Acemoglu and Robinson (2006). Under (b) we have the ‘standard’ case where more democracy leads to a decrease in the probability that the political elite will have de facto political power.

Proposition 2.

Given equation (11), it follows that there exists some function $g(\cdot)$ for which $g''(\cdot) > 0$ such that

$$\theta^i(D) > \theta^i(N) \text{ and } F(D) > F(N).$$

Proof:

See Appendix A.

Since g is increasing at an increasing rate, introduction of democracy induces the political elite to invest in θ to such a degree that de jure power loss due to democracy is *overcompensated* by the increase in de facto political power. This is an important result. It implies that the political elite invest to a point where the probability that they will have de facto power is higher under democracy ($F(D) > F(N)$), and thus may cause greater inefficiency. An obvious context where we might see a convex power returns to political investment is the case of the discovery of significant reserves of natural resource such as oil. If we assume that $g(\cdot)$ depends on the opportunities for rent seeking, then a surge in such opportunities would accelerate the change in g . For example, Vicente (2009) tries to assess the role of natural resources in determining corruption in São Tomé and Príncipe by exploring

the oil discovery announcements in the country in 1997–1999. He finds results that are “indicative of increased competitiveness for state resources, namely those that are accessible through the political channel.” The author also argues that the increased corruption in customs may be the result of increased private consumption by the elite (which controls oil revenues).

2.2. Education

We now examine how the elite chooses the amount of spending on (subsidy of) the education of citizens. We assume imperfect capital markets, implying that the citizens are not able to borrow in order to invest in human capital (education). We also assume that education (E) directly increases productivity and total product/income (Y) for the elite. Rent (return to the elite) is defined as income minus total spending on education.²

We define the following.

$$Y = \sum_{i \in \varphi} Y^i \text{ (elite's aggregate income); } R = \sum_{i \in \varphi} R^i ;$$

$$E = \sum_{i \in \varphi} E^i \text{ (aggregated investment in the education of citizens).}$$

We assume that spending on education (E) affects the rents (R) to the elite i .

$$\text{Let } R^i(E) = Y^i(E) - E ; Y^i(E) > 0; Y^{i'}(E) > 0.$$

To simplify the analysis, we focus on the case of democracy ($S = D$). Taking the derivative of equation (8) with respect to E^i we get

$$-\phi f(\phi(\sum_{j \in \varphi, j \neq i} g(\theta^j(D)) + g(\theta^i(D))) - \eta - E) R^i(E) + F(\phi(\sum_{j \in \varphi, j \neq i} g(\theta^j(D)) + g(\theta^i(D))) - \eta - E) (-1 + \frac{\partial Y}{\partial E^i}) \leq 0 \quad (12)$$

$$\text{and (with complementary slackness) } \sum_{i \in \varphi} E^i \geq 0$$

² Implicitly, E is spending on human capital as well as a production factor and has a direct influence on P^c at the same time, instead of showing these links in separate equations. This is for simplicity and does not affect the quality of the results.

Proposition 3.

Case 1: If $\frac{\partial Y^i}{\partial E^i} \leq 1$; $\forall E^i \geq 0$, then no education investment (the elite will not support citizens' education).

Case 2: If

$$\lim_{E \rightarrow 0} \frac{\partial Y^i}{\partial E^i} = \infty; \frac{\partial^2 Y^i}{\partial E^{i2}} < 0; \forall E_i \geq 0; \text{ and } \frac{\partial Y^i}{\partial E^i} \text{ at } Y(Y) < 1;$$

then an internal solution (for investing in education) exists.³

Proof:

See Appendix A.

Under case 1, an increase in η (more political power for citizens under democracy) implies that the left hand side of equation (12) is reduced so that if the political regime does not change back to less democracy and there is no increased investment in de facto political power (no change in θ), the elite will reduce spending on education. By reducing E , the elite loses the gain in Y that is derived from the education of citizens but increases R by reducing spending on education. The elite will keep doing this until investment in education is zero. Given that the marginal effect of E on Y is less than one, R with no spending on education should be higher.

Given the growing empirical literature (Barro, 1991; Acemoglu et al., 2005; Glaeser et al., 2007) on the links between democracy and education, and in particular the conflicting findings in this literature, it would be useful to present comparative statics with respect to η . We are interested in looking at how E changes when η increases. In other words, we want to identify the effect of an increase in the extent of the political power of citizens (that is derived from democracy) on the equilibrium level of spending on education by the elite.

³ Both cases may hold under democracy and non-democracy (we just remove η under non-democracy). Note that other outcomes are possible, depending on the concrete functional form of $Y(E)$.

In order to do this we need to find $dE^i/d\eta$ and evaluate its sign. We can try to formulate the explanation of what exactly happens under case 2 by applying the *implicit function theorem* to see if we can sign the expression $dE^i/d\eta$.

Define K as the LHS of equation (12). Then, using the implicit function theorem, the marginal effect of the degree of political power of citizens (from democracy) on education can be expressed by the following equation.

$$\frac{dE^i}{d\eta^i} = -\frac{\partial K/\partial \eta}{\partial K/\partial E^i} = \left[\frac{\phi^2 f'(\phi(\sum_{j \in \varnothing, j \neq i} g(\theta^j(D)) + g(\theta^i(D))) - \eta - E) R^i(E) - F(\phi(\sum_{j \in \varnothing, j \neq i} g(\theta^j(D)) + g(\theta^i(D))) - \eta - E) (-1 + \frac{\partial Y}{\partial E^i})}{\phi^2 f'(\phi(\sum_{j \in \varnothing, j \neq i} g(\theta^j(D)) + g(\theta^i(D))) - \eta - E) R^i(E) + F(\phi(\sum_{j \in \varnothing, j \neq i} g(\theta^j(D)) + g(\theta^i(D))) - \eta - E) (\frac{\partial^2 Y^i}{\partial E^{i2}})} \right] \quad (13)$$

Proposition 4. Assuming η (de jure political power of citizens) is specified, an increase in η causes the elite to reduce the equilibrium level of spending on citizens' education, as long as $\partial^2 Y^i/\partial E^{i2} < 0$ (as long as there are diminishing returns to education).

Proof (sketch):

It follows from equation (13) that in the case where $\partial Y^i/\partial E^i$ is greater than one (which must hold for positive values of E), the numerator in the ratio inside the brackets is negative. If the denominator in equation (13) is also negative, then $dE^i/d\eta$ will be negative. An increase in citizens' political power (i.e., in democracy) will be accompanied by less spending on citizens' education. The opposite happens if the denominator in equation (13) is positive, and $dE^i/d\eta$ will be positive. Under which circumstances will the denominator of the ratio inside the brackets be negative and under which cases will it be positive?

If we assume that $\partial^2 Y^i / \partial E^{i2}$ is negative, then we have $dE^i / d\eta < 0$; i.e., the effects of η on E is unambiguously negative (note that $Y''(E)$ is < 0 was the condition under proposition 3-case 2 for an internal solution for spending on education to occur). On the other hand, if we assume that $Y''(E)$ is > 0 , then the second term in the denominator (inside the brackets) will be positive and we cannot sign $dE^i / d\eta$ without further assumptions. Depending on these assumptions, $dE^i / d\eta$ could be either positive or negative. Given these results, we should expect to find that as democracy strengthens, some countries would invest more in education, while others would invest less. Indeed, this is consistent with the mixed results on the effects of democracy on education in the empirical literature and with the fact that some dictators support public education (education of the masses).

3. SUMMARY AND DISCUSSION OF THEORETICAL FINDINGS

The interplay of political reform, de facto political power and citizens' education can lead to multiple outcomes. We may have a situation where the elite support citizens' education and their political participation, and thus the country may move along a path of sustainable democratization and less unequal income distribution (assuming more citizens' education reduces inequality). We may instead have a situation where the elite choose lower (or no) subsidy for citizens' education and no democracy, and we would end up with an oligarchic society with high inequality. A third situation would be a society characterized by partial democratization and elite's support for the education of the masses. Finally, a fourth case is a partially democratized country with weak support for citizens' education. Overall, the results imply that the cross-country empirical evidence on the *positive* association between democracy and growth, democracy and education (particularly in countries where the elite has de facto political power), and democracy and economic policy (economic institutions) should be statistically insignificant or at best yield mixed results, as seems to be the case in the empirical literature. The figures in Appendix B also appear to be consistent with these conjectures.

Figure 1 suggests that the association between democracy and growth is negative and statistically insignificant. Figure 2a indicates that there is a positive association between democracy and schooling. However, the interplay between ethnolinguistic fractionalization and democracy has a negative impact (Figure 2b). To the extent that the political elite in countries with high fractionalization may try to invest a lot (overinvest) in maintaining control of de facto power as democratization proceeds, we interpret this as a crude validation of proposition 4; i.e., in such countries more democracy results in the elite investing less in the education of the masses. Figures 3a and 3b suggest that there is no positive association between democracy and good macroeconomic policy.

Together, the propositions presented in this paper suggest that the political elite may find an optimal η , then decide on the levels of investment in de facto political power (θ) and citizens' education (E), given the other parameters. Under Proposition 1, the elite decides to invest in de facto political power to have control of overall political power while the citizens are offered de jure power (democracy). Proposition 2 implies that the elite may overinvest in securing de facto power to the point where the probability to have de facto political power is greater under democracy. If the de facto power is used to maintain economic institutions that favor the elite, we may have inefficiencies and lower growth (Acemoglu and Robinson, 2008). Proposition 3 implies that the elite's decision to support or not support mass education may depend on whether education has significant strong effects on the elite's rents. An interesting corollary of Proposition 4 is that if $dE^i/d\eta$ is negative, then subsidizing the education of the masses and democratization (political reform) might be viewed by the elite as substitute instruments. Education may increase political participation of citizens and thus may reduce de facto political power of the elite, particularly if political participation enables citizens to have a greater say in the reform of economic institutions. Education may also allow citizens to access traditionally elite-dominated economic activities and thus would reduce elite's rents, which also reduces de facto political power of the elite. An interesting question arises. Under which circumstances would spending on education (of the masses) have strong positive effects on elite's income (rents)? The answer may depend (at least in part) on the stages of development and the size of the middle class. In the following, we provide a brief discussion of some plausible mechanics that might be involved.

In the early stages of development education may not add significantly to the elite's income as society relies more on traditional types of agriculture and the elite have low (or no) incentives to subsidize the education of the masses. As income per capita rises (medium development stage; middle income countries) education begins to gradually become a necessity (or a normal good) for at least two reasons. More people can now invest in education, including private education, so that the notion of 'education as luxury good' is no longer supported as larger numbers of individuals are able to have access to education. Second, as the structure of the economy changes with the share of agriculture declining and the share of manufacturing and services rising—and thus requiring more skilled labor (higher human capital)—education now becomes essential to getting a job in industries that use skilled labor (productive sector). Yet, while some individuals from the masses may be able to invest in education (as income rises), the political elite may also see a significant incentive to support more education in the country in order to satisfy the needs of the business elite, particularly in the presence of imperfect financial markets where the non-rich are often credit-constrained. This is because the political elite and the business elite in developing countries, more often than not, tend to support each other. In this case, we would expect to see higher spending on education in middle-income countries (Proposition 3, Case 2).

Additionally, the size of the middle class may play a crucial role. If education leads to stronger political participation and the size of the middle class increases so that large groups which were formerly part of the masses (citizens) can now solve the collective action problem, then the elite may lose de facto political power and it might be too costly for them to regain such power. In this case, in order to maintain control of de facto power the political elite may choose to significantly reduce spending on education. The political elite may need to use co-optation of small groups from the educated or politically active citizens to maintain de facto power. In order to achieve this, the elite may focus education subsidy (spending) on a specific groups, thus creating a small middle class that would support the political elite (Bourguignon and Verdier, 2000).

In theory, in the absence of information on the values of the parameters for the relevant functions we cannot unambiguously determine what happens to democracy and spending on

education when the elite simultaneously decide education and democracy. An important implication for empirical analysis is that when examining cross-country experiences we might find conflicting results depending on the countries studied. We might find countries that increased education and democracy (where the two could be viewed as complementary), and others that restricted political freedom and other democratic institutions and improved the education of the masses, or improved democratic institutions but restricted spending on education (mainly in order to maintain a very small middle class).

4. EMPIRICAL EVIDENCE FROM AFRICAN COUNTRIES

We test *proposition 4* using the fixed-effects estimator and panel data from Africa, covering the period from 2007 to 2017. More specifically, we examine the link between democracy and indicators of the quantity and quality of education after controlling for the role of income and mineral rents (as a proxy for the elite) as well as the interplay of mineral rents and democracy. Data on income and mineral rents are from the World Bank's World Development Indicators database online, while data on the quality of education are from the World Bank's TCdata360 database online. Democracy data are from the Polity IV project.

Studying the case of African countries is useful given that many governments (including in North Africa) have in the last decade tried to democratize, albeit to varying degrees. At the same time, there are large cross-country disparities in spending on public education. In addition, many African countries tend to be natural-resource dependent, and in some cases have experienced high levels of rent seeking allowing the political elite to control a large share of the total wealth in the country.

Collier and Hoeffler (2009) find that the combination of high natural resource rents and open democratic systems reduces growth in developing countries, but checks and balances offset this negative effect. The authors contend that "resource-rich economies need a distinctive form of democracy with particularly strong checks and balances." We posit that the rents obtained by the elite can have an important effect on the elite's preferences for both democracy and education.

The empirical analysis provides preliminary support for Proposition 4. The results in Table 1 indicate that democracy is not associated with more investment in public education. In fact, democracy seems to have a negative and statistically significant association with the quality of education (columns 3 and 4). We also find that mineral rents have a negative association with secondary school enrolments and the quality of the education system. The coefficient on the interplay of mineral rents and democracy is, however, statistically insignificant at the 10-percent level or better.

5. CONCLUSION

In this paper, we have examined the interplay between political institutions, de facto political power and the education of the masses. We did so by presenting a theoretical model that makes the equilibrium spending on education and democratization depend on the elite's de facto political power. The analysis yields some interesting results. First, the model identifies conditions under which the elite may overcompensate the loss of de jure power by investing too much in de facto political power, so that the probability to have de facto power is higher under democracy than under non-democracy. This may lead to a worsening of economic institutions, and may contribute to understanding why in the early stages of democratization (partial democracy) growth may be even lower than under autocracy. Second, the results indicate that we may have multiple outcomes depending on the interplay between political reform, de facto political power and education. One of these outcomes could be a society characterized by partial democratization and elite's support for the education of the masses. Another outcome would be a partially democratized country with weak support for citizens' education. These findings seem to be consistent with the results in Bourguignon and Verdier (2000). If the goal of the political elite is to maintain (inefficient) economic institutions and policies favoring the elite, then the model clearly shows that the control of de facto political power is crucial and, in order to avoid this, political reform should also put in place instruments to maintain good economic institutions.⁴

⁴ This, of course, is easier said than done since the political elite would halt or reverse democratization (political reform), if they have the power to do so, in order to maintain their preferred economic institutions.

The inclusion of education can help explain why some dictators support spending on public education and other public goods. Using African data, we obtained support for the proposition that more democratization is not necessarily positively associated with increased spending on education. In fact, democracy and education have a negative association in some cases and no association in others.

The paper makes three contributions to the literature. First, we introduce nonlinearity of de facto power function and show that this generates an over-compensation effect. Second, we allow for the inclusion of a public good; namely, education, in the model which can help explain why some dictators spend on education and also allows for the possibility that public education expenditure may decline as a result of democratization. Third, we present preliminary empirical evidence validating this last prediction.

The model we use may appear similar to McGuire and Olson's (1996) model of stationary versus roving bandits. However, while in McGuire and Olson's model, the stationary bandit's main objective is to maximize rent, in our model the elite maximize de facto power and face a tradeoff between security and gains (derived from using an educated labor force—a productive public good). Furthermore, our model clearly allows for the possibility of less spending on public goods under democracy than under autocracy. McGuire and Olson's model shows that there is always more spending on public goods under democracy than under autocracy.

To simplify the analysis, we made some strong assumptions and ignored a few important factors. For example, the assumption that the citizens cannot borrow to invest in human capital may not hold in some countries where credit may be available to students. We have also assumed (as have several other studies) that education increases political participation. However, this may not always be the case, and in some cases democratization may depress participation (Bowler et al., 2007; Kostadinova and Power, 2007). Additionally, it would be useful to distinguish between the political elite and the business (economic) elite as they may

be two distinct—albeit mutually supportive—groups with different preferences for economic institutions and citizens’ education (see Galiani et al., 2008; and Baliaoune-Lutz, 2009b). Notwithstanding these caveats, the present paper provides useful insight into the differences we observe in the preferences for supporting public education in countries at comparable levels of democratization; and the differences we note in levels of democracy across countries with comparable educational levels. The theory outlined in this paper could be used to test empirically how democracy and education (and income) could be jointly determined by the size and de facto political power of the elite. Although the present model is simple and static in nature, it could provide a way of reconciling the conflicting evidence on the links between democracy and education. Indeed, the results could be used to shed light on the factors that account for the conflicting findings in the empirical literature on the relationships between income, democracy and education (Acemoglu et al., 2005 and 2008). It is important to note that the results we obtain in this paper point to the possibility of significant simultaneity bias in cross-sectional analysis focusing on causality links between education and democracy since the political elite determines both the level of democratization and education.

Finally, as a theoretical extension of this model, it would be interesting to explore what happens when we make ϕ and θ^i depend on education. This, however, is beyond the scope of this paper but the mechanics we outlined should provide useful guidance.

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Table 1. Democracy and education (fixed-effect estimates)

	Expenditure on education (percent of gdp)	Secondary enrolments	Quality of education system	Quality of primary education
Democracy	-1.356 (0.797)	-0.183 (0.601)	-0.220*** (0.052)	-0.154** (0.687)
Income (log)	16.472 (15.538)	39.520*** (8.277)	1.066*** (0.328)	1.394*** (0.347)
Mineral rents	1.160 (0.837)	-0.192** (0.088)	-0.009** (0.003)	0.003 (0.005)
Mineral rents x Democracy	-0.159 [0.107]	0.016 (0.036)	0.002 (0.001)	-0.001 (0.002)
Observations [countries]	138 [30]	232 [36]	324 [39]	324 [39]
R-sq: Within	0.054	0.340	0.268	0.195
Between	0.043	0.618	0.084	0.000

Standards errors (in parentheses) are clustered at the country level.

Data sources: See text

APPENDIX A

Proof of Proposition 1

Proposition 1.a: If $g''(.) = 0$, then $\theta^i(D) > \theta^i(N)$ and $F(D) = F(N)$.

If $g''(.) = 0$, then the cost for the elite of investing in the facto political power is linear. For any value of η greater than zero, suppose that $\theta^i(D) = \theta^i(N)$, then $g'(\theta^i(D)) = g'(\theta^i(N))$ i.e. the RHS of equation (11) equals one, while the LHS of equation (11) is less than one. As $\theta^i(D)$ is increased, the LHS of equation (11) increases until both sides are equalized and both sides are equal to one. QED.

Proposition 1.b: If $g''(.) < 0$, $\theta^i(D) > \theta^i(N)$ and $F(D) < F(N)$.

If $g''(.) < 0$, then investing in the facto political power exhibits diminishing returns. For any value of η greater than zero, suppose that $\theta^i(D) = \theta^i(N)$, then $g'(\theta^i(D)) = g'(\theta^i(N))$ i.e. the RHS of equation (11) equals one, while the LHS of equation (11) is less than one. As $\theta^i(D)$ is increased, the LHS of equation (11) increases while the RHS decreases until both sides are equalized and both sides are less than one. QED.

Proof of Proposition 2

If $g''(.) > 0$, $\theta^i(D) > \theta^i(N)$ and $F(D) > F(N)$.

If $g''(.) > 0$, then investing in de facto political power exhibits increasing returns. For any value of η greater than zero, suppose that $\theta^i(D) = \theta^i(N)$, then $g'(\theta^i(D)) = g'(\theta^i(N))$ i.e. the RHS of equation (11) equals one, while the LHS of equation (11) is less than one. As $\theta^i(D)$ is increased, the denominator of the LHS of equation (11) decreases while the numerator of the RHS increases.

From the proof of Proposition 1.a it also follows that if $g''(.)$ is sufficiently close to zero, then increasing $\theta^i(D)$ will lead to a convergence of the RHS and the LHS of equation (11), respectively, until both sides are equalized at a value greater than one (more generally, $g''(.)$ has to be small relative to $f'(.)$). QED.

Proof of Proposition 3

Case 1:

It is easy to see from equation (12) that if $\frac{\partial Y^i}{\partial E^i} \leq 1$, then the LHS of equation (12) will be strictly negative. Thus, the elite will not invest any amount in subsidizing the education of the citizens;

$$\sum_{i \in \phi} E^i = 0. \text{ QED.}$$

Case 2:

It follows from equation (12) that if $\frac{\partial Y^i}{\partial E^i} > 1$, then it is possible to have the LHS of the equation equal to zero.

$$\text{If } \lim_{E \rightarrow 0} \frac{\partial Y}{\partial E^i} = \infty; \frac{\partial^2 Y^i}{\partial E^{i2}} < 0; \forall E_i \geq 0; \text{ and } \frac{\partial Y^i}{\partial E^i} \text{ at } Y(Y) < 1;$$

then an internal solution (for investing in education) exists.

If $\lim_{E \rightarrow 0} \frac{\partial Y}{\partial E^i} = \infty$, as E approaches zero, then there are very large (increasing) returns to scale

and the elite will invest in education. The assumptions that $\frac{\partial^2 Y^i}{\partial E^{i2}} < 0$ and that $\frac{\partial Y^i}{\partial E^i}$ at $Y(Y)$

< 1 imply that an optimal level of investment in the education of the citizens within the budget constraint ($E < Y(E)$) exists. At such point the returns to the elite from the education of the citizens, other things being equal, are maximized. Equation (12) shows that in this case, the term $F(.)(-1 + \frac{\partial Y}{\partial E^i})$ will be positive which allows the LHS of equation (12) to be zero and

$$\sum_{i \in \phi} E^i \text{ to be } > 0. \text{ QED.}$$

Appendix B

All data used to generate the following plots are from Lake and Baum (2003).

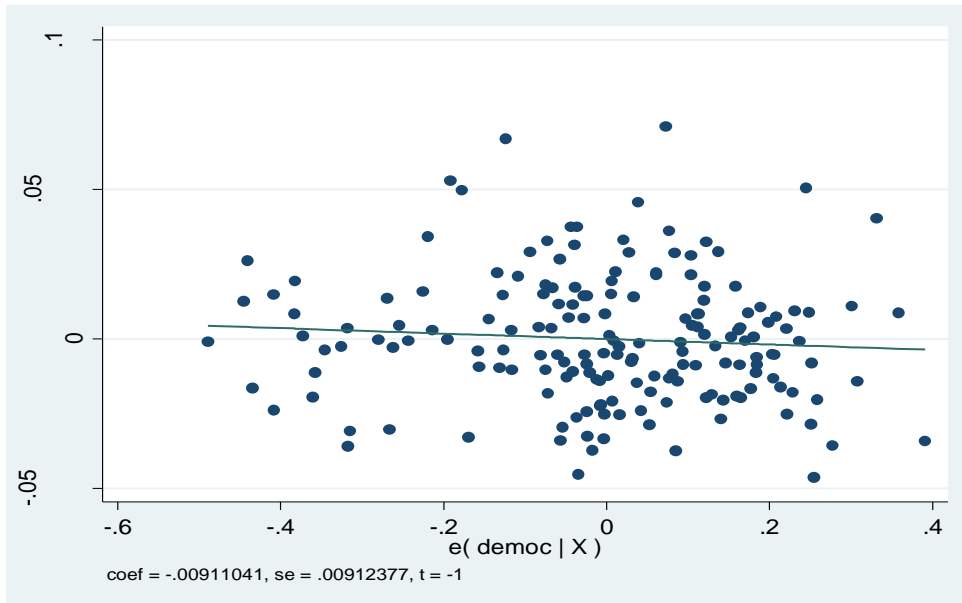


Figure 1. Democracy and growth

These are added-variable plots (avplots generated by Stata) from a growth equation where we control for other variables (initial income, financial depth, ethnic fractionalization, a dummy for the 1970s and for Latin America). Complete estimation results may be obtained from the author upon request.

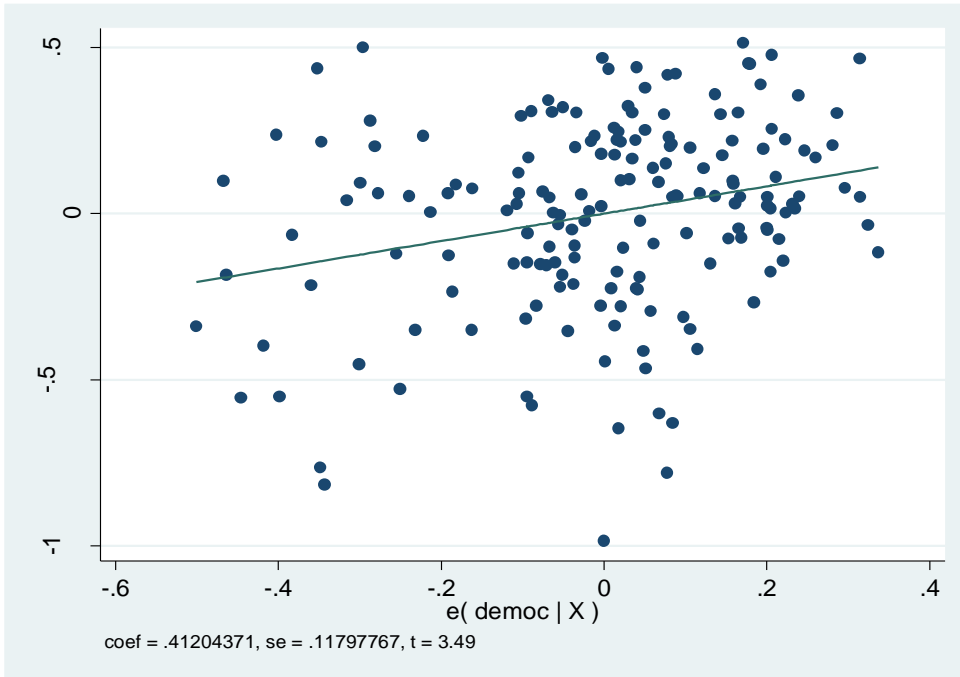


Figure 2a. Education and democracy

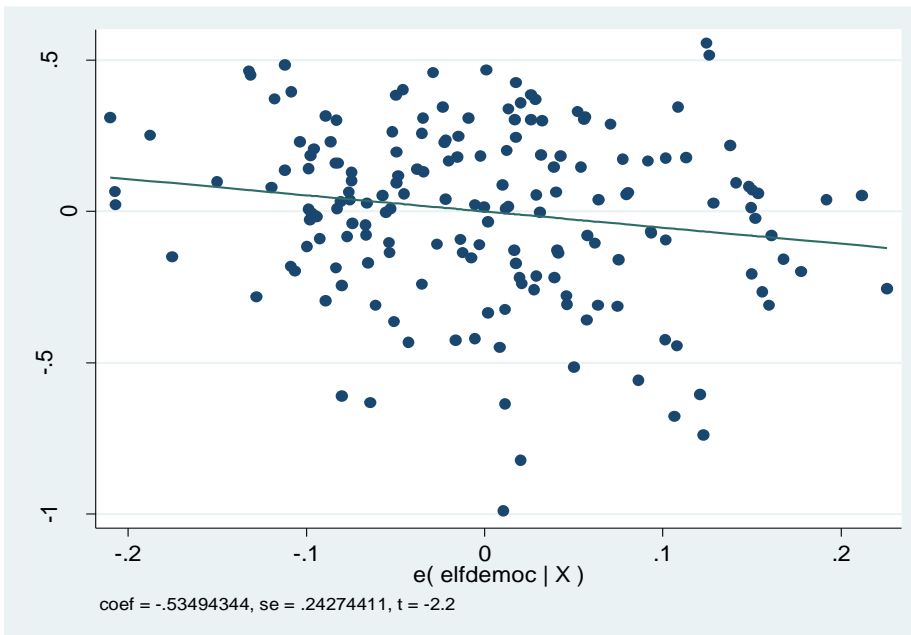


Figure 2b. Education and Ethnic fractionalization X democracy

These are added-variable plots (avplots generated by Stata) from an equation where the dependent variable is average years of school attainment (after controlling for other relevant variables). Complete estimation results may be obtained from the author upon request.

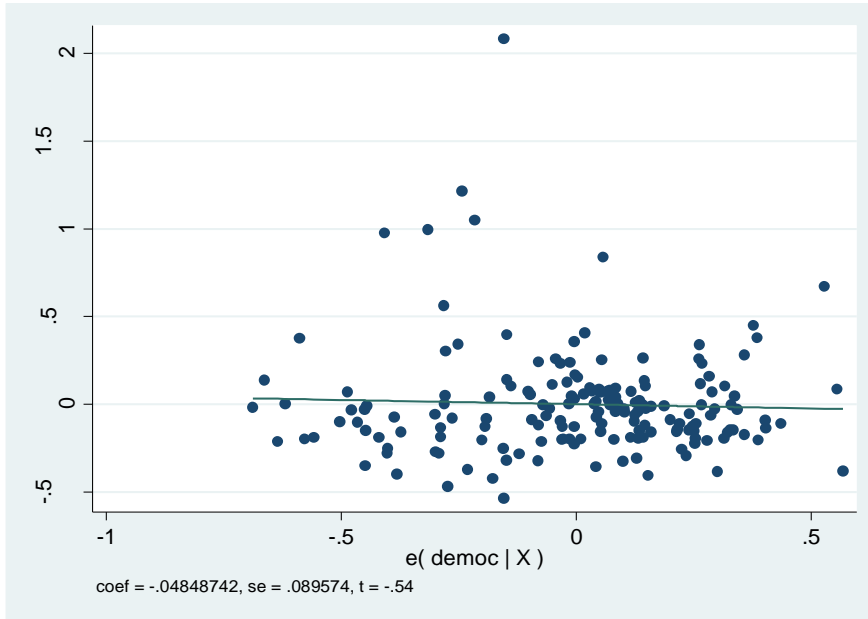


Figure 3.a. Democracy and economic policy (black market premium)

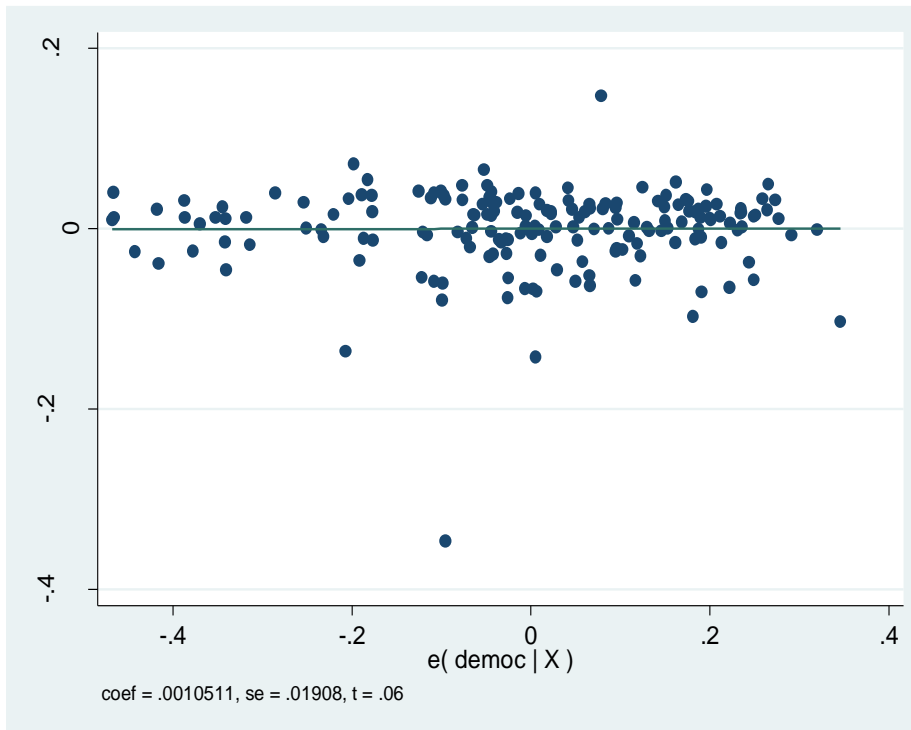


Figure 3.b Democracy and economic policy (budget surplus)

These are added variable plots (avplots generated by Stata) from an equation where the dependent variable is the indicator of economic policy—black market exchange rate premium or fiscal surplus as a ratio of GDP— (after controlling for other relevant variables). Complete estimation results may be obtained from the author upon request.