

Institutional Quality and the Tenure of Autocrats

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1 Introduction

A substantial body of literature concludes that nations that maintain market institutions and have limited government have higher economic growth rates and higher per capita incomes. This conclusion goes back at least to Adam Smith (1776), and includes historical studies by Mokyr (1990) and Landes (1998), and institutional analyses by Olson (1996) and Baumol (1990). If the advantages of market institutions are widely recognized, why would the political leadership of any nation not adopt them? One commonly given answer often applied to autocracies is that while the general population may be better off with market institutions, the political leadership can obtain personal benefits from more oppressive economic institutions.

Referring to the poor nations of Africa, Ayittey (2008: 168) says, "African despots are loath to relinquish control or power. They would rather destroy their economies and countries than give up economic and political power. This power allows them to allocate or extract resources to build personal fortunes and to dispense patronage to buy political support." Acemoglu and Robinson (2006: 115) say it is "...because superior institutions and technologies may reduce their political power and make it more likely that they will be replaced." This paper examines the proposition that autocrats can enhance their hold on power, and reduce the probability they will be replaced, by retaining low-quality economic institutions.

Svolik (2009) notes that autocrats always share power with a ruling coalition, and the ruling coalition may receive concentrated benefits from poor institutions, paid for by costs imposed on everyone. Concentrated interests are able to organize more effectively than larger groups, Olson (1965) observed, so a ruling coalition may be able to maintain power even when the benefit to the ruling group is smaller than the costs imposed on everyone else. The payoffs to members of the ruling coalition buy support for the autocrat. Thus, as Acemoglu and Robinson (2006), Ayittey (2008) and Svolik (2009) hypothesize, autocrats impose unproductive economic institutions on their citizens to maintain their political power. This paper examines that hypothesis by looking at the effect of the quality of economic institutions on the tenure of autocrats.

2 Measuring institutional quality and the tenure of autocrats

The Fraser Institute's Economic Freedom of the World (EFW) Index, updated annually by Gwartney, Lawson, and Hall (2012), provides a frequently used measure of the quality of economic institutions. The index is designed specifically to quantify the quality of economic institutions but to leave out measures of political freedom, such as civil liberties or democratic government. A substantial literature shows that when countries have higher-quality economic institutions as measured by the EFW index, they have higher per capita incomes, and when countries improve their economic freedom as measured by the index they have higher rates of economic growth. Berggren (2003) and De Haan et al. (2006) offer reviews of the literature, and subsequent studies, such as Faria and Montesinos (2009), have reaffirmed the positive impact of market institutions. The EFW index is a good measure of institutional quality to use for examining the hypothesis that autocrats can strengthen their hold on power by imposing economically unproductive institutions.

Data on the tenure of autocrats comes from Svolik and Akcinaroglu (2007), a database that lists autocrats and the years that they ruled. The database also lists the reason the autocrat left office, and several reasons are of particular interest. Some autocrats died in office, so there is no way to know how long their tenure might have been had they not died. Some autocrats left office

through democratic elections. This would seem unusual for autocrats; however, in some instances a single ruling party is almost always elected, so losing office through election would be similar to a coup. In the empirical work that follows, regressions were run with all available data from Svobik and Akcinaroglu's data set, and with a smaller data set that deleted some cases in which one could raise a question about whether the leader qualified as an autocrat.

Some autocrats have served very long tenures, such as the hereditary dynasty that has existed in North Korea since the country was divided, and Fidel Castro in Cuba, but autocrats like these may be memorable precisely because they remained in power so long. For the full set of 738 autocrats in Svobik and Akcinaroglu's data set the mean tenure was 6.7 years and the median tenure was 3.2 years, so the median tenure was less than a full presidential term in the United States. Svobik and Akcinaroglu's dataset begins in 1945, prior to the beginning of the EFW dataset used here as an indicator of institutional quality, so autocrats with no EFW data were dropped from this analysis. Because of data limitations many of the regressions below used only 99 of those autocrats to examine length of tenure. Those 99 autocrats had a mean tenure of 12.4 years and median tenure of 10.3 years, so they retained power longer than the average in Svobik's entire data set. In some cases, discussed below, a question may arise about whether they qualify as autocrats, so a smaller set of 67 autocrats were used to check the robustness of the regressions to dropping questionable cases.¹ Those that remain in the smaller data set have an average tenure of 11.1 years, and with a median tenure of 10.0 years.

Using the Svobik and Akcinaroglu dataset to measure the tenure of autocrats and the EFW index as a measure of institutional quality allows an empirical examination of the hypothesis that low-quality economic institutions help autocrats to remain in power.

3 Institutional quality and tenure

Table 1 shows some regression results that examine the correlation between the tenure of autocrats and institutional quality, using the length of the tenure, in years, of an autocrat as the dependent variable. Regression 1 uses EFWrate as the only independent variable, along with a

constant term. EFWrate is the EFW value at the end of the autocrat's tenure minus the EFW rate at the beginning, divided by the number of years the autocrat was in power.² Thus, it is the average annual change in the EFW index during the autocrat's tenure. In some cases, the EFW index was not available at the start of the autocrat's tenure. In those cases, the earliest available EFW index was used, and it was divided by the number of years between that initial EFW index and the final one, so in all cases the EFWrate measures the average annual change in the index.

[Table 1 about here.]

From the autocrat's point of view, the coefficient on EFWrate indicates whether autocrats, on average, increase their length of tenure during which they hold power by altering the quality of economic institutions. The hypothesis that autocrats impose low-quality institutions on their people to increase their grip on power implies a negative sign on EFWrate, but the sign is positive and statistically significant, so contrary to the initial hypothesis, it appears that autocrats can increase their hold on power by improving institutional quality.

Regression 2 adds additional independent variables to account for other factors that might affect a nation's political stability. The first additional independent variable is barrels of oil produced per capita, which was included because Cuaresma, Oberhofer, and Raschky (2011) found that oil production increased the tenure of dictators. Sachs (2001), Diamond (1997), and others have suggested that geographical factors, including the distance a country is from the equator, can affect economic development, prompting the inclusion Distance, which measures a country's distance from the equator. A binary variable, Died, is given a value of 1 if the autocrat died in office, because the autocrat's tenure was truncated by death. A binary variable, Africa, is included for countries in Africa. Until the 1960s many African countries were colonies of European countries without their own independent governments, and it is possible that their short histories as independent countries coupled with their former colonial status might impact the ability of an autocrat to remain in power. These additional variables³ produce the regression equation,

$$\text{Tenure} = \alpha + \beta_1 \text{EFWrate} + \beta_2 \text{Oil} + \beta_3 \text{Distance} + \beta_4 \text{Died} + \beta_5 \text{Africa} + \varepsilon,$$

which is regression (2) in Table 1.

In regression (2) the statistical significance of the EFWrate falls, but it remains statistically significant at better than the 10 percent level. Oil is not statistically significant, nor is Distance. Died is positive and significant, so it appears that while death obviously truncates the tenure of an autocrat, those who stay in power until they die have a greater hold on power than those who leave office for other reasons. Africa is not statistically significant in regression (2), but is significant at the 5% level in regressions (3) and (4), so it appears that African autocrats remain in power substantially longer on average than autocrats in other parts of the world.

The length of tenure was measured in days in the Svobik and Akcinaroglu dataset. The regression results in Tables 1 and 2 multiply EFWrate by 365 to make the units the same for the length of tenure and EFWrate, so the coefficients on EFWrate are not as large.⁴ The 349.0 coefficient on EFWrate in regression (2) can be interpreted to say that if the EFW rating of the autocrat's country increased by 1 unit every year the autocrat was in power, the autocrat's tenure would be 349 years longer. EFW is measured on a zero to 10 scale. Only a few countries have a ranking below 5 on the scale, and a ranking above 8 would put a country in the top four, so a three-unit increase from 5 to 8 would indicate that institutions were transformed from those in a country like the Republic of Congo to those in a country like the United States. Even a half-unit change in economic freedom over the entire tenure of a ruler would be a big change. For example, South Korea (EFW rating = 7.40) is half a unit higher than Malaysia (EFW = 6.90). If an autocrat remained in power for 10 years and EFW increased by half a unit over that decade, EFWrate would be 0.05, and the coefficient in regression (2) would indicate that the expected tenure of the autocrat would be $349 * 0.05 = 17.45$ years longer. These estimates suggest that if institutions improve by a substantial amount during an autocrat's tenure, the autocrat will have a much firmer hold on political power.

As the introduction noted, a substantial literature documents the correlation between improvements in measured EFW and increases in per capita income, so the increased tenure of autocrats should be related to an increase in per capita income. To examine this, PCRate is

added as a variable that measures the average annual increase in per capita income under an autocrat's tenure, calculated the same way as EFWrate. The initial PCI is subtracted from the final PCI and divided by the number of years the autocrat remained in power.⁵ When that variable is added as reported in regression (3), neither EFWrate nor PCIRate are statistically significant. Regression (4) includes PCIRate but leaves out EFWrate, and while PCIRate has the expected positive sign, it is not statistically significant.⁶ One can see that PCIRate takes significance from EFWrate, but if EFWrate causes PCIRate, as the literature suggests, the proper specification would be to leave PCIRate out of the regression and use regression (2). The paper reports these additional specifications to show what happens when PCIRate is included, and to show that EFWrate is statistically significant when PCIRate is not in the regression, while the reverse is not true.

When the smaller set of autocrats described in footnote 1 is used to see if the results depend on the inclusion of questionable cases, the results are qualitatively the same. EFWrate remains statistically significant at about the same level of significance in regressions (1) and (2), and the coefficient sizes are within 10 percent of each other in the comparable regressions. The results are robust to the exclusion of leaders some readers might not consider to be autocrats.

The results in Table 1 use homoskedastic error terms, and Table 2 reports some different specifications which were estimated to check the robustness of the results. Both the Bruesch and Pagan (1979) and White (1980) heteroskedasticity tests fail to reject the null hypothesis of homoskedasticity. Nonetheless, regression 1 shows that using White's heteroskedasticity-corrected standard errors still leaves the EFWrate positive and statistically significant at the one percent level, and the magnitude of the EFWrate coefficient is even larger than its value in the earlier regressions. As an additional robustness check, regression 2 was estimated using feasible generalized least squares (FGLS) to correct for non-common variances between groups but constant variances within the groups. The magnitude of the EFWrate coefficient is approximately the same or larger as in the earlier regressions and is positive and statistically significant at the ten percent level, showing that it is both economically and statistically significant.

[Table 2 about here.]

Panel data methods can be used to control for the variation explained by the estimators due to cross-country differences. Fixed effects models are not appropriate because the model includes Distance and Africa, and these two regressors do not vary over time. Therefore, these variables would drop out. To capture the cross country effect while keeping those two regressors, a dictator random effects model is employed in regression 3. In this regression, an estimate of ρ is used to capture the fraction of the variance due to the disturbances. The estimate of ρ in the model is 0.09 which suggests that there is not much variation due to cross country differences. Furthermore, a Breusch-Pagan Lagrangian Multiplier test is employed to further determine whether OLS is appropriate. The null hypothesis states that the variance of the disturbances is zero. A chi-square of 16 yields a p value that fails to reject the null hypothesis. Therefore, the OLS model presented in Table 1 is appropriate. Nonetheless, in a dictator random effects model the results are qualitatively unchanged from the results in Table 1. The results in Table 2 show that the results are robust to several different changes in estimation techniques.

4 Initial institutional quality has no effect on tenure

Autocrats come to power in a variety of conditions. Table 3 contains regression results that examine whether the initial institutional quality, when the autocrat first comes to power, has any effect on the expected tenure of the autocrat. InitialEFW is the EFW rating for the country when the autocrat first assumed power. The first regression in Table 3 shows that when it is used as the only independent variable it is not statistically significant. Adding the other independent variables from Table 1 still leaves the initial EFW insignificant, so these regressions show that the initial institutional quality when an autocrat assumes power does not affect the tenure of the autocrat. One might conjecture either a positive or negative sign for this variable. Possibly, better institutional conditions when an autocrat assumes power would represent favorable conditions, lengthening tenures, but it is also possible that poor institutional conditions create more room for improvement. Neither of these conjectures is borne out in the data, so it appears that autocrats

can lengthen their expected tenure by improving institutional quality, but that institutional quality when they assume power has no effect on their tenures.

[Table 3 about here.]

Because the improvement in institutional conditions lengthens the expected tenure of autocrats, and because it appears initial institutional conditions are unrelated to tenure, one would expect that autocrats with longer tenures would leave their countries with better economic institutions, and regressions (3), (4), and (5) indicate this is so. FinalEFW, the EFW score in the autocrat's last year in power, is positive when it is added to regression (2), when it is run by itself, and when it is run in place of InitialEFW.

Levy (1988) notes that political leaders who anticipate longer tenures have an incentive to improve economic institutions, because a larger economy provides them with a larger source of revenue. Holcombe and Rodet (2012) argue that government revenue is a good indicator of the benefits political leaders have available to them in their leadership roles. This suggests the possibility of causality running from tenure to improvement in institutions; however, autocrats will not know their length of tenure when assuming office, but can positively affect it through institutional change. So, even noting the possibility that causation may run in both directions – especially if autocrats can forecast their tenures to some degree – it seems more plausible for the direction of causation to run from things autocrats can choose, like institutional quality, rather than from things that they cannot know with any certainty in advance. Further, the hypothesis that autocrats maintain poor institutions because they benefit personally embodies the assumption that institutional quality is the choice of the autocrat. As Lichbach (1998) and Kurrild-Klitgaard (1997) note, the overthrow of autocrats is notoriously difficult to forecast, because rebellions tend to remain underground until they achieve a critical mass, and then erupt with little warning, so tenure is always uncertain.

Unlike in Table 1, which includes measures of either improvements in institutional quality or improvements in per capita income as independent variables, in Table 3 the oil variable is consistently statistically significant and positive, as is the binary variable for Died in Office and the

Africa variable. Cuaresma, Crespo, and Raschky (2011) find that the tenure of autocrats is longer in countries that have oil resources, which does not appear to be the case when changes in institutional quality are accounted for, as in Tables 1 and 2. From Table 3 it appears that there is a positive correlation between oil resources and tenure when the level of institutional quality is controlled for, but not when accounting for changes over the autocrat's tenure.

5 Survival analysis

Another empirical approach is survival analysis, which estimates how long it will take for a certain event to occur. At any point in time, dictators face a risk of having their tenures end. Survival analysis can be used to estimate the impact of changes in the quality of economic institutions on the survival rate of dictators. The survival analysis used here begins with semi-parametric estimation using Cox regression. Cox regression uses a proportional hazard assumption, which assumes all countries face the same hazard function, but with constant proportions that differ among countries, where the constant is replaced with an exponentiated linear regression. Cox analysis leaves the shape of the hazard function unspecified which allows it to take any form (Buis 2006). The hazard function can be interpreted as the likelihood that a dictator would be overthrown from power if the risk of being overthrown remains constant over time. Table 4 presents estimates from the survival analysis. Column 1 gives Cox regression estimates.

[Table 4 about here.]

Cox regression estimates are less precise than parametric analysis. Parametric analysis can be used instead, but an assumption must be made about the shape of the hazard function (Buis 2006). A parametric analysis was undertaken using the assumption of six different functional forms that plot hazard rates over time: exponential, Weibull, Gompertz, log-normal, log-logistic, and generalized gamma. The results presented in Table 4 are robust to the use of any of these functional forms, but only the exponential, Weibull, and Gompertz are presented.

The coefficient from the Cox regression in Table 4 of -300.28 can be expressed as a hazard rate of $2.4e-131$ which is very close to zero. A negative coefficient and a hazard rate less than 1 both signify that an improvement in EFW increases an autocrat's expected tenure, and this result is robust to the alternative parametric specifications found in Table 4. This survival analysis indicates that an increase in the rate of EFW improvement by one unit from the average rate of EFW makes that autocrat 99 percent less likely to be overthrown during that time period. As a robustness check, the levels of EFW were also analyzed and the hazard rate of EFW was .66 and statistically significant at conventional levels.

Figure 1 illustrates these results using the cumulative incidence function (CIF) where the CIF represents the probability of a change in political leadership occurring by time t . The figure shows results for both the maximum and minimum changes in EFW, Figure 1 indicates that when a leader oversees a greater improvement in EFW, the probability of the autocrat losing tenure is lower, so increases in EFW increase the probability of a longer tenure.

[Figure 1 about here.]

6 Competing risks

If autocrats are interested in maintaining their hold on power, the reason an autocrat is removed from power may be of secondary importance to the fact that the autocrat has been displaced. Still, the relationship between institutional quality and the reason an autocrat is displaced is an interesting question, and Acemoglu and Robinson (2006: 129), discussing areas for future research that can extend their framework, say, "... it may be informative to derive different (potentially testable) implications from models where the fear of replacement comes from different sources..." and an empirical investigation of that issue is possible with this dataset. Competing risk analysis can employ survival analysis to use the reason for an autocrat's exit as a benchmark in the presence of competing risks.

[Table 5 about here.]

Table 5 reports the findings from the competing risk analysis, evaluating separately the risk of leaving office due to a coup, due to natural death, and due to revolt. The results suggest that improving institutions decrease the hazard of an autocrat losing his power in office due to a coup. Both the EFW level at the end of an autocrat's tenure and EFW growth during an autocrat's tenure are statistically significant at conventional levels. The level of economic freedom also appears to reduce the hazard of an autocratic leaving office due to natural death, but this result is not quite as robust because no similar finding is present for the growth of economic freedom during an autocrat's tenure. Meanwhile, the coefficients in the Revolt regressions are not statistically significant. The results in Table 5 suggest that the increased tenure that autocrats enjoy when they improve institutional quality comes from the decreased likelihood of being displaced from someone within the government, while the likelihood of being displaced by a popular uprising is unaffected by changes in institutional quality.

7 Why do nations retain unproductive economic institutions?

A substantial literature shows that countries with higher-quality economic institutions, as measured by a higher EFW rating, are more prosperous. Why would autocrats retain unproductive institutions in the countries they rule? A common answer is that lower-quality institutions enable autocrats to maintain their hold on power. The ability of their governments to transfer resources to themselves or to those they favor may solidify their power by getting supporters to back them with the hope of being on the receiving side of political favoritism. The idea is plausible, but the empirical investigation undertaken here indicates that it is not true. Autocrats can increase the length of their rule by improving the quality of economic institutions in their countries, so maintaining poor economic institutions shortens the expected tenure of autocrats and weakens their hold on power.

Perhaps autocrats get sufficient short-run benefits from maintaining low-quality institutions, that they are willing to risk a shorter tenure. Buchanan and Lee (1982) and Tullock (1975) offer models in which there is a trade-off between short-run benefits and long-run costs. However, in a

study that is suggestive, Yang (2008) shows that when corrupt customs officials are replaced by contractors who objectively enforce customs laws, government revenue increases. More broadly, Holcombe and Rodet (2012) find that the absolute amount of resources under government control is lower in countries with lower-quality institutions, calling into question any theory that autocrats maintain poor institutions so that they can get a larger slice of a smaller pie. It is unclear that there are short-run benefits, although that issue is different from the issue this paper examines.

The paper's key findings are that autocrats whose countries have the greatest average annual improvement in economic institutions over their tenures on average have the longest tenures, and that the quality of initial economic institutions when they assume power has no effect on the length of their tenure. This calls into question the hypothesis that autocrats maintain poor economic institutions because even though it lowers the prosperity of their countries, it helps them hold on to power. The empirical evidence indicates that the opposite is true, and that if autocrats want to solidify their hold on their political power, they should implement reforms to increase the quality of the economic institutions in their countries.

If this is so, why do autocrats not take more aggressive steps to improve economic institutions in their countries? One answer is that on average, they do move in that direction. For the 99 autocrats in this paper's data set, 60 oversaw increases in their EFW index, while 39 oversaw decreases, so increases in EFW took place in 61 percent of this sample and decreases took place in 39 percent. Still, a substantial percentage oversee a decline in the quality of their economic institutions, even though the results presented here indicate it weakens their hold on power.

Autocrats may not understand what would be in their own best interests, but another more plausible answer is that institutions are difficult to change, as North, Wallace, and Weingast (2009) note, and that even when institutional quality improves there is always the threat that institutions can deteriorate again as individuals – who may or may not be political leaders – look for ways to gain individual advantages over others. Setting aside obvious problems like organized crime and outright corruption, individuals engage in rent-seeking activities as a part of day-to-day

politics, and Olson (1982) notes that over time there is a tendency for institutional quality to deteriorate as political interests become more organized and more powerful, leading to the decline of nations. Even if autocrats realize that improving the quality of economic institutions would solidify their hold on power, political forces may work against their being able to implement those changes. Autocrats cannot make things happen just because they want those things to happen.

La Porta et al. (1999) suggest that exogenous historical factors have a substantial impact on institutional quality, and such factors may be difficult for current rulers to overcome. Tullock (1965) and Niskanen (1971) offer models explaining why public sector outcomes are likely to be different from what those at the top of the political power structure would prefer, because of the incentives faced by those below them. Poor institutions may persist because autocrats are unable to change them even if they want to, rather than their wanting to maintain those poor institutions. Public choice has focused largely on collective decision-making in democracies and treated autocracies as if autocratic governments just carry out the will of the autocrat, but autocrats may not have the power or the skill to see their preferences implemented. Questions such as those addressed here could be better answered if public choice offered as complete a model of collective decision-making in autocracies as it does for democracies.

Because the evidence also shows that length of tenure is not associated with the quality of institutions when autocrats assume power, this rules out initial institutional quality as an explanation for why autocrats would want to maintain low-quality economic institutions. It is not because they inherited those institutions. While the difficulty of implementing institutional change seems plausible, perhaps autocrats prefer the ability to arbitrarily use their power even realizing that this risks their ability to maintain it. While economic models do not often include power in the utility function, some people do gain utility from the ability to exercise arbitrary power over others.⁷

By offering evidence that low-quality economic institutions work against the best interests of autocrats, this paper challenges the conventional wisdom regarding why low-quality economic institutions persist in poor countries. These results suggest that with regard to economic institutions, the interests of autocrats are closely aligned with the interests of the citizenry. The

question of why autocrats often retain unproductive economic institutions is an important one for people living under poor institutions, because of its policy implications. If the conventional wisdom that autocrats maintain poor institutions for their own personal benefit is true, that suggests that additional constraints on political leadership, including perhaps a change of leaders, would benefit citizens in countries with poor institutions. If, as this paper suggests, the conventional wisdom is not correct, the road to improved institutions is more complex.

Autocrats may believe that, as these results indicate, they can benefit from institutional improvements. That would fit autocrats such as Augusto Pinochet in Chile and Park Chung-hee in South Korea (both of whom maintained dictatorships for 18 years) and the current communist government in China; cases in which autocratic leaders moved to substantially improve economic institutions. If the results in this paper hold up, working with autocrats who already have an established power base to show them how they can benefit personally from improved institutions, and helping them to implement changes in a status quo in which some parties will be reluctant to accept change, may be a good strategy.

This paper presents some evidence that challenges the conventional wisdom on a subject that is of great importance to those who live in countries with low-quality economic institutions, but in reporting what we found, we have no vested interest in these results. More research on the subject – regardless of whether it supports this conclusion or contradicts it – would be welcome. The issue is important enough to deserve more attention.

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Notes

¹ Reviewing Svolik's list of autocrats, eleven cases were identified in which leaders may not have been autocratic, some because they were democratically elected, and some because their countries were assigned relatively high polity2 scores. The questionable autocrats were Mogae of Botswana, Gustavo of Ecuador, Zedillo of Mexico, Zia of Pakistan, Noriega of Panama, Macchi of Paraguay, Fujimori of Peru, Garcia of El Salvador, Diouf of Senegal, Lee of Taiwan, and Armalino of Uruguay. As a robustness check, all observations for those countries were dropped and the regressions below re-run without them. One can debate whether they should be included (we favor including them to rely on Svolik's data without our input), but the results are qualitatively the same whether or not they are included, so the results do not depend on them.

² This was also calculated as a percentage change, and the results remain essentially the same regardless of the way EFWrate is calculated.

³ Data for Oil is from indexmundi.com; for Distance, the latitudes of country capitals are found at <http://lab.lmnixon.org/4th/worldcapitals.html>, and the calculator used to convert this data to distance from the equator is found at http://www.eaae-astronomy.org/eratosthenes/index.php?option=com_content&view=article&id=47&Itemid=68; Died is from Svolik & Akcinaroglu (2007).

⁴ This was suggested by a reviewer, to make the coefficients easier to interpret.

⁵ Data for PCRate come from the World Bank Per Capita Income, PPP (Purchasing Power Parity). As with EFWrate, PCRate was calculated both this way and as a percentage change in PCI, and in specifications not shown in the paper, the results are essentially the same regardless of the way that PCRate is calculated.

⁶ The number of observations varies in the regressions because of data limitations. In regression (1) there are observations for 99 different autocrats, but in regression (2) only 80 of them have observations for all of the independent variables. In regression (3) only 71 autocracies have data for both PCRate and EFWrate. Regression (4) uses only those countries in regression (2) that have data for PCRate.

⁷ Note that one of the reasons Niskanen (1971) gives for his budget maximization hypothesis is that those in government gain more power with larger budgets, so the idea that power over others generates utility is not completely foreign to public choice analysis.

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Table 1: OLS
Dependent variable: Length of tenure

Length	(1)	(2)	(3)	(4)
EFWrate	315.9** (.027)	349.0* (.068)	598.7 (.329)	
PCIrate			965 (.228)	1031 (.179)
Oil		2537 (.391)	10060* (.054)	10041 (.053)
Distance		.0531 (.852)	-.1154 (.663)	-.1009 (.695)
Died		2248* (.052)	1869* (.096)	1773* (.089)
Africa		536 (.511)	1535** (.042)	1572** (.035)
N	99	80	71	71
Adj. R ²	.03	.04	.12	.12

Note - numbers in parenthesis are p-values.

*** statistically significant at the 1%

** statistically significant at the 5%

* statistically significant at the 10%

Definitions:

EFWrate=Difference in EFW divided by # of years.

PCIrate=Difference in PCI divided by # of years. In thousands of \$US

Oil=Oil Production Per Capita. Oil is given in billions of barrels per day. It's divided by population which is in thousands.

Distance=Distance from the Equator

Died=A binary for whether the ruler died in office

Africa= dummy for countries in Africa

Table 2: Estimator robustness check
Dependent variable: Length of tenure

Length	White Std. Errors	FGLS	Random Effects
EFWrate	595.1*** (.000)	389.5* (.09)	595.1*** (.000)
PCfirst	0.16 (.23)	-0.10 (.31)	0.15*** (.01)
Oil	6920 (.17)	11515 (.35)	6921** (.036)
Distance	-.10 (.803)	0.42*** (.002)	-0.10 (.70)
Died	1964* (.09)	1983*** (.000)	1965 (.11)
Africa	1685** (.03)	-221 (.60)	1685** (.036)
N	71	45	71
R ²	.19	.70	--

Note - FGLS corrects for between group heteroskedasticity.
Numbers in parenthesis are p-values. *P<.10; **P<.05; ***P<.01;

Definitions:

EFWrate=Difference in EFW divided by # of years.

Oil=Oil Production Per Capita. Oil is given in billions of barrels per day. It's divided by population which is in thousands.

Distance=Distance from the Equator

Died=A binary for whether the ruler died in office

Africa= dummy for countries in Africa

Table 3: OLS
Dependent variable: Length of tenure

Length	(1)	(2)	(3)	(4)	(5)
InitialEFW	87.69 (.705)	223 (.396)	-559 (.148)		
FinalEFW			1046*** (.008)	601** (.012)	863*** (.002)
Oil		9607*** (.007)	11246** (.017)		6138*** (.028)
Distance		-.07 (.784)	-.03 (.894)		.22 (.312)
Died		2080** (.026)	2393** (.015)		3185*** (.000)
Africa		1086* (.07)	1414** (.035)		1488** (.02)
N	141	118	107	198	158
Adj.R ²	.002	.08	.17	.02	.16

Note - numbers in parenthesis are p-values. *P<.10. **P<.05; ***P<.01;

Definitions:

InitialEFW=EFW rating at the beginning of the autocrat's tenure

FinalEFW= EFW rating at the end of the autocrat's tenure

Oil=Oil Production Per Capita. Oil is given in billions of barrels per day. It's divided by population which is in thousands.

Distance=Distance from the Equator

Died=A binary for whether the ruler died in office

Africa= dummy for countries in Africa

Table 4: Survival analysis
Duration variable: Length of tenure

	Cox	Exponential	Weibull	Gompertz
EFWrate	-300.78*** (.005)	-208.9*** (.007)	-378.29*** (.000)	-248.5*** (.002)
PCRate	-.884** (.029)	-.52 (.136)	-.866** (.024)	-.79** (.03)
Oil	-5.2 (.30)	-5.24 (.32)	-5.34 (.28)	-5.5 (.26)
Distance	-.00001 (.92)	-.00005 (.664)	-.00001 (.89)	-.00002 (.88)
Africa	-.985*** (.003)	-.73** (.33)	-1.05*** (.002)	-1*** (.003)

Note - Coefficients reported. N=71. Numbers in parenthesis are p-values. *P<.10.
P<.05; *P<.01;

Definitions:

EFWrate=Difference in EFW divided by # of years.

PCRate=Difference in PCI divided by # of years. In thousands of \$US

Oil=Oil Production Per Capita. Oil is given in billions of barrels per day. It's divided by population which is in thousands.

Distance=Distance from the Equator

Africa= dummy for countries in Africa

Table 5 - Competing risks: Separating three duration variables

	Coup		Natural		Revolt	
	(1)	(2)	(3)	(4)	(5)	(6)
EFW	-.62*** (.006)		-.51* (.08)		.06 (.87)	
EFW Growth		-1.26*** (.000)		-.37* (.10)		.50 (.14)
PCI	.00001 (.818)		.0001 (.32)		-.008*** (.004)	
PCI Growth		-.0004 (.17)		-.00001 (.83)		-.0004 (.22)
Distance	.00002 (.877)	-.00001 (.67)	-.00001 (.92)	.0004 (.48)	.0004 (.41)	-.00004 (.91)
Oil	-23 (.21)	9.3 (.60)	-5.18** (.03)	-2.86 (.36)	11 (.11)	6.15 (.54)
N	147	71	147	71	147	71

Note - Dependent variable is the length of tenure. Coefficients are reported. Numbers in parenthesis are p-values. *** P<.01; **P<.05; *P<.10.

Definitions

EFW=Level

EFW Growth = EFW at end - EFW at beginning

PCI= Level

PCI Growth = PCI at end - PCI at beginning.

Oil=Oil Production Per Capita. Oil is given in billions of barrels per day. It's divided by population which is in thousands.

Distance=Distance from the Equator

Africa = dummy for countries in Africa

