

Are Non-democracies More Susceptible to Coups than Democracies in West Africa?

Written by Aditya Kurup

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<https://www.e-ir.info/2022/04/22/are-non-democracies-more-susceptible-to-coups-than-democracies-in-west-africa/>

ADITYA KURUP, APR 22 2022

In the vast and storied political landscape of Africa, the West African sub-region has certain distinctive features that set it apart from the rest of the continent. Boafo-Arthur (2008) called it the “heartbeat of politics in Sub-Saharan Africa”, claiming that it served as the vanguard of armed resistance against colonial rule. Liberia, which gained independence in 1847, is the oldest African republic. Ghana was the first country in Sub-Saharan Africa to attain independence in 1957. Guinea’s independence from France in 1958 proved to be the first in a line of dominoes that ultimately led to the independence of the remaining Francophone countries in the continent.

Unfortunately, West Africa also has the dubious distinction of ushering in a phenomena that would plague the continent for the next sixty years; regime changes through means of military coup d’états. The literature consensually agrees that the Togolese coup of 1963, which saw the assassination of prime minister Sylvanus Olympio, set the blueprint for all of Africa’s forays into military adventurism (Owusu, 1971; Conteh-Morgan, 2000; Boafo-Arthur, 2008; Kemmence, 2013). McGowan and Johnson (1984) would describe West Africa as ‘the region *par excellence* of the military coup d’état’ for having the greatest record of coup activity compared to anywhere else in the world. McGowan and Johnson (1984) and Kemmence (2013) noted that, despite encompassing one-third of all majority-ruled African States, this sub-region has seen about half of all successful coups d’états, one-third of all reported coups and half of all reported plots in the continent. The only country out of the 16 countries in the sub-region that has never witnessed a military coup to this date is Cape Verde.

What makes West Africa vulnerable to coups? This paper, upon synthesis of the surveyed literature, identified three broad reasons, namely ethnic fractionalization, lack of economic progress and military dominance over civilians. All of these factors work in synergy with each other, creating an environment conducive for coup activities.

The relationship between social cleavages between ethnic groups and the persistence of coups was further operationalized by Jackson (1978) into three elements; social mobilization, cultural pluralism and political factors such as the prevailing political party system and mass participation. According to him, while a single-party system has a stabilizing effect on governments in countries that recently attained independence, a diversity of political parties can create a turbulent socio-political ecosystem. When faced with electoral turnout, this destabilizing effect caused by a multi-party political apparatus is further amplified by the dominance of a single ethnic group. Most West African countries associate political parties with ethnic groupings (Kemmence, 2013). This partisanship seeps into the military, creating conditions for rivalries that ultimately result in coups and counter-coups. A prominent example of a multi-party system and ethnic fractionalization catalyzing instability was in Benin after it declared independence from France. The period between 1960 and 1972 saw a cavalcade of regime changes through coups, with figures like Hubert Maga, Sourou-Migan Apithy and Justin Ahomadegbe-Tometin rising to power; all three of these men represented a different political party, and each political party predominantly represented a different ethnic group coming from different areas in Benin. On the other hand, freshly independent Niger was ruled for the most part by a single-party regime, which managed to stabilize the uprising of the less dominant Touareg group against the dominant Hausa group. Even though the former example saw greater success of coup-realization, it is undeniable that ethnic fractionalization has created conditions for the plotting and attempt (if not success) of coups in both these countries.

Are Non-democracies More Susceptible to Coups than Democracies in West Africa?

Written by Aditya Kurup

Coming to economic performance, Johnson and McGowan (1984) provided empirical evidence which suggested that economic underperformance was a significant factor that could potentially lead to coups. They also argued that some measures of positive economic performance, such as high levels of productive employment, robust economic growth, sound export performance and diversified commodity exports, are highly stabilizing. However, Adebayo (2002) challenged this assessment by pointing to Nigeria and Togo repeatedly undergoing regime changes and (failed) coup attempts, despite their remarkable economic growth. Clearly, there is some lack of consensus in the literature regarding the impact of economic underperformance on the likelihood of coup attempts, though this paper argues that Johnson and McGowan (1984) made a more compelling case by studying underlying antecedents to coup activities in all countries of Africa.

Finally, military dominance over civilians also plays a role in subverting the socio-political order. Janowitz (1977) and Kemmence (2013) both addressed the high non-existent civil-military relations in West Africa; Kemmence argued that the repetitive military coups in Guinea-Bissau were a direct result of the lack of civil-military relations. He argued:

...even though the country has a civil government, the military dictates and controls every move of the civil rulers who are actually the puppets of the generals in the military

A reading of West Africa's post-colonial political history suggests that the military and civilians constantly feud with each other, with both groups having their own internal cleavages and power struggles, eventually resulting in tumultuous civil discord. Ultimately, the military almost always emerges as the dominant actor in times of conflict. This leads us to question, why would the military want to interfere in the political functioning of these countries? McBride (2004) chalks it down to personal greed, motivated by the wealth and privileges enjoyed once they gain power and control over the state. How is it that the military is able to easily overpower civilians in this sub-region? Adebajo and Rashid (2002) contend that it is because of the vast resources at the disposal of the military, establishing a correlation between military spending and occurrence of coups. Nigeria, for instance, has the most resourceful military in all of Africa and they've reported the most coup plots (including failed attempts and successes) at fifteen as of 2018.

Are the relentless coups undermining democratization in West Africa?

According to the Polity IV scores of West African nations between 1958 to 2018, 7 out of 15 countries (excluding Cape Verde) have, at some point, received a score that would place them in each of the Polity IV categories; autocracy (-10 to -6), closed anocracy (-5 to -1), open anocracy (0 to 5) and democracy (6 to 10). These countries are Benin, Burkina Faso, Gambia, Ghana, Guinea-Bissau, Niger and Nigeria. Cote D'Ivoire, Guinea and Mauritania have received scores at some point in this period that placed their regime type as either autocratic, closed anocratic or open anocratic. However, they never scored high enough to be considered democratic. Togo is the only country to not have progressed beyond the 'closed anocracy' regime type. Liberia, Mali and Sierra Leone have undergone all regime types other than closed anocracy, while Senegal has undergone all regime types other than open anocracy. Scatter-plots illustrating periods of each regime type for each country is presented in Appendix 1, graphs 1 to 4. An inspection of the scatter-plots demonstrates that, for most countries, their status as a 'democracy', 'anocracy' or 'autocracy' is not defined by a continuous time-period, but is rather dispersed throughout their history. Ghana, for instance, started as an autocracy post-independence and, following a 1978 coup, was classified as a democracy. However, following the 1981 coup, Ghana once again regressed into an autocratic regime. Over time, the regime became progressively less autocratic, until it achieved full democracy once it attained some stability (Appendix 2). Similar trends can be observed in Gambia, Liberia, Mali and several other countries in the sub-region. This trend is indicative of the destabilizing power of coup d'états and how they undermine the democratization of this sub-region. Boafo-Arthur (2004) and Conteh-Morgan (2000) argued that the political instability shepherded by the culture of militarism has jeopardized the establishment of a steady democracy in the sub-region. The onset of the third wave of democracy in the early 1990s did arouse some optimism that the sub-region is on the verge of reaching political equilibrium. However, the expectations of a stable democracy are yet to materialize (Boafo-Arthur, 2004). Côte d'Ivoire is one example of a country that was an aspiration in the sub-region for maintaining stability and progressing towards a full democracy. Unfortunately, the country imploded following multiple coup attempts from 1999 to 2002. Sierra Leone and Liberia are still trying to forge a stable political model after landmark elections in 2002 and 2005,

Are Non-democracies More Susceptible to Coups than Democracies in West Africa?

Written by Aditya Kurup

respectively. The elections in the two countries also marked the end years of civil wars. In 1997, Liberia had an election (albeit, under questionable circumstances according to Boafo-Arthur (2004)) to end the civil war that started in late 1989. Charles Taylor won that election but the instability in Liberia (mostly encouraged by Taylor himself), continued until he was forced into exile in Nigeria in 2003. In a nutshell, the West African sub-region has struggled to achieve sustained democracy in the face of rapid regime changes.

Identifying some research gaps: Are democratic regimes really less susceptible to coups in West Africa?

As mentioned in the previous sub-section of the literature review, an overwhelming majority of the nations in West Africa have experienced the full spectrum of regime types, ranging from autocracy to democracy, in their short post-colonial history. Furthermore, all 15 countries under examination, except Senegal, faced at least one reported coup attempt in each of the regime types that they experienced. This is illustrated in the scatter-plot given in Appendix 3. Senegal experienced only one coup attempt in this period, when Mamadou Dia failed to overthrow sitting president Leopold Sedar Senghor in 1962. Senegal had a polity score of -4 in 1962 (making it a closed anocracy that year) and has not faced a coup attempt since.

Given that a lot of these nations have experienced at least one coup in each regime type, this sub-region would be ideal for studying whether democratic regimes are truly more susceptible or resilient to coups than autocratic and anocratic regimes. However, very few studies have empirically explored this sub-region specifically (outside of studies looking into Sub-Saharan Africa as a whole) and investigated country-wise effects.

The relationship between regime types and their susceptibility to coup attempts is a contentious one amongst scholars; Tulaslem (2015) referred to it as an “empirical conundrum that remains unsolved”. Huntington (1968), Linz (1978), and O’Donnell (1979) all argue against the conventional wisdom that democracies are resilient to regime instability, primarily because they invite political pluralism. The domineering presence of interest groups tends to weaken the state from carrying out its capacity to govern effectively. When economic modernization outpaces the development of democratic political institutions, the emergence of political order and stability becomes less likely. As a result, coups, revolutions, and the breakdown of democratic institutions are likely scenarios in highly democratic regimes. Powell et al (2017) found that young democracies are more predisposed to coup attempts than either civilian authoritarian regimes or older democracies. While none of this literature focuses on West Africa specifically, the findings might be relevant to establishing *a priori* expectations of this paper’s final results.

On the other hand, modern empirical studies by Casper and Tyson (2014), Marinov (2014), Tusalem (2015) and Bell (2016) have provided sufficient evidence using a global sample that democracies (with a higher Polity IV score) are less coup-prone than autocracies; Bell (2016) has also validated this hypothesis for Sub-Saharan African nations separately. In fact, the most convincing argument for expecting West African democracies to be less coup-prone than autocracies can be found in the aforementioned Powell et al. (2017) paper, which essentially echoes the literature surveyed so far:

...we recall that coup perpetrators must come from either the military or other elites in the state apparatus—people who already enjoy a privileged status in society. Thus, leaders seeking regime change are likely to exhaust other legal channels before perpetrating a coup and are most likely to do so only when they expect their leadership to cause a significant improvement in the status quo

Furthermore, all the aforementioned literature concedes that coups arise more frequently when coup plotters have genuine goals of creating both economic prosperity and political legitimacy. Economic prosperity can be achieved by opening an economy to foreign aid, investment, and international business transactions—all of which are strongly tied to democracy (Tusalem, 2015; Powell et al., 2017). Thus, it’s reasonable to assume that in West Africa, coups are more often plotted to either escape situations of non-democracy or to strengthen democracy, since this sub-region is economically deprived and politically unstable. This paper shall, therefore, hypothesize that the odds of a coup attempt occurring in an autocracy or anocracy is greater than that of a democracy, and attempt to validate this hypothesis.

Are Non-democracies More Susceptible to Coups than Democracies in West Africa?

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Research Questions

A review of the literature leads us to the following hypothesis:

H1A: Autocracies and anocracies have greater odds of facing a coup attempt than democracies. In other words, as the quality of democracy increases, the more resilient to coups a West African country is.

The other hypotheses this paper will be validating are:

H1B: Economic progress reduces the odds of a coup attempt occurring in a country

H1C: Increased ethnic fractionalization increases the odds of a coup attempt occurring in a country.

H1D: Increased military resourcefulness increases the odds of a coup attempt occurring in a country

Empirical Analysis

Data and research design

In order to test the aforementioned hypotheses, this paper shall analyze an unbalanced panel data of 15 West African countries from 1958 to 2018. Since Cape Verde has not faced even a single coup attempt in this time frame, we have excluded it from the analysis. This is because there is no variability in this subject that can give additional insights when analyzing fixed-effects. This paper will utilize a logistic regression and test it for country fixed-effects and random effects, due to the fact that the dependent variable is binary. Given that we are analyzing panel data, the unit of analysis is country-years. All statistical analyses were conducted on the StataMP 14.1 statistical package.

Functional form of fixed and random effects logistic model and simple intuition behind interpreting the coefficients

Assuming that the panel data has N countries for T time periods, the functional form of the logistic 'unobserved effects' model is as follows:

$$\ln\left(\frac{p_{it}}{1 - p_{it}}\right) = \alpha_i + \beta_0 + X_{it}\beta \quad \forall i = 1(1)N, t = 1(1)T$$

Here, p_{it} is the conditional probability that at least one coup will be attempted in a country i in year t , given X_{it} , β and α_i . Therefore, $\frac{p_{it}}{1 - p_{it}}$, is the odds that at least one coup will be attempted in that country-year.

X_{it} is the $1 \times k$ matrix of independent variables.

β is the $k \times 1$ matrix of parameters.

β_0 is the intercept term.

α_i is called 'the unobserved effect'. This can include, for instance, some unobserved historical or institutional factors for some country i . In the fixed-effects model, we assume that α_i is correlated with some or all of the explanatory variables. However, in the random effects model, α_i is uncorrelated with the matrix of independent variables.

Now, for both models,

$$\frac{p_{it}}{1 - p_{it}} = e^{\alpha_i + \beta_0 + X_{it}\beta}$$

Therefore, a one-unit increase in the value of independent variable X_{itj} will result in a e^{β_j} factor change in the odds, *ceteris paribus*. If $0 < e^{\beta_j} < 1$, then an increase in the value of X_{itj} will lead to reduced odds that at least one coup will be attempted in a country-year. If $e^{\beta_j} > 1$, then an increase in the value of X_{itj} will lead to increased odds that at

Are Non-democracies More Susceptible to Coups than Democracies in West Africa?

Written by Aditya Kurup

least one coup will be attempted in a country-year. Here, e^{β_j} will be the coefficients on each of the independent variables in the final estimation results, and is called the odds-ratio.

Dependent variable

The dependent variable is “coup attempt” and was drawn from Powell and Thyne^[1], who describe coups as “attempts by the military or other elites within the state apparatus to unseat the sitting head of government using unconstitutional means”. This paper defines “coup attempts” as a dichotomy, distinguishing between those country-years where a coup attempt was not experienced (0) from those in which the country-year experienced at least one attempt (1). This paper included coup attempts that succeeded or failed, simply because the aim is to explain the factors that lead to coup attempts rather than the outcome of an attempt.

Independent variables

a) This paper utilized the Polity IV^[2] as a proxy to measure the quality of democracy in each country-year. A Polity score ranging from -10 to -6 places a regime as an ‘autocracy’ (auto), -5 to -1 as a ‘closed anocracy’ (closed_ano), 0 to 5 as an ‘open anocracy’ (open_ano) and 6 to 10 as a ‘democracy’ (demo). Rather than using the Polity score to measure the quality of democracy, this paper shall instead denote the regime type for each country-year. This is done to clearly and better distinguish regime types, and to conclusively test our hypothesis. Thus, the resultant ‘regime type’ variable is an ordinal categorical variable which can be split into four dummies; for this analysis, we will be using the ‘demo’ dummy as the reference group. It is expected that the coefficients (or odds-ratio) on the three named dummy variables will be greater than 1

b) ‘Economic progress’ (GDPPC) is denoted by the GDP per capita (US\$, current prices). This data was acquired from the World Bank database^[3]. It is expected that the coefficient on this variable will be less than 1.

c) Ethnic fractionalization (EF) is measured using the Historical Index of Ethnic Fractionalization provided by the Harvard.edu Dataverse database^[4] for each country-year. The Index ranges from 0 to 1 and the higher the value of the index, the greater the ethnic fractionalization. It is expected that the coefficient on this variable will be greater than 1.

d) Military Spending (MS) of each country-year (in million US\$, current prices) will act as a proxy for military resourcefulness. The data was acquired from the SIPRI Military Expenditure Database^[5]. It is expected that the coefficient on this variable will be greater than 1.

Estimation Results

The total number of country-years present in the panel data is 867. However, due to missing values, only 688 observations were suitable for analysis. The logistic regression output is provided in Appendix 4. The coefficients represent the odds ratio associated with the variable. Model 1 introduces country random effects while model 2 introduces country fixed effects. Both models have a high enough chi-square statistic to indicate the overall significance of the models. The pseudo R-square of the fixed effects specification is 0.054 which indicates a decent but not excellent fit.

In terms of the estimation of the coefficients, the results are consistent across both specifications. In both models, the estimated coefficients on the three regime types are greater than 1. In other words, if a country switches from being a democracy to an autocracy or anocracy, the odds of that country facing a coup attempt increases. This result aligns with *a priori* expectations, and the “regime type” variable is statistically significant in both models.

Similarly, in both models, the estimated odds-ratio on the variable GDPPC is less than one. In other words, economic progress reduces the odds that a country will face a coup attempt in a given year. This result aligns with *a priori* expectations, and this variable is statistically significant in both models.

Are Non-democracies More Susceptible to Coups than Democracies in West Africa?

Written by Aditya Kurup

The estimated coefficient on the variable EF is greater than one in both models. Thus, increased ethnic fractionalization in a country increases the odds of a coup attempt. This aligns with *a priori* expectations. However, this variable is only statistically significant in the country fixed-effects specified model. This is probably because the fixed-effects model will consider variability in ethnic fractionalization within countries as opposed to between countries like the random-effects model does. Thus, it can lead to changes in the calculation of the standard errors of the variables.

The estimated coefficient on the variable MS is greater than 1 in both models. Thus, increased military resourcefulness in a country increases the odds of a coup attempt. This aligns with *a priori* expectations. This variable is statistically significant in both models.

Selecting appropriate specification: Aikake Information Criteria (AIC) and the Hausman Test

The fixed-effects model has a lower Aikake Information Criteria (494.26) than the random-effects model (565.56). Therefore, the fixed-effects model is a more suitable specification than the random-effects model. To further establish that the fixed-effects model is the more appropriate specification, the Hausman Test was conducted. The chi-square statistic was high enough that we could reject the null hypothesis that the random-effects model is appropriate at 5% level of significance. As a result, all the variables (including EF) are statistically significant if we consider the fixed-effects specification. The results for the Hausman Test are given in Appendix 5.

The variance influence factors (VIFs) for the independent variables are also provided in Appendix 5; since all the VIFs are below 10, we can reject the presence of multicollinearity amongst the explanatory variables. The VIFs are also provided in Appendix 5.

Solidifying the relationship between regime types and their resiliency to coup attempts: Cross-tabulation, Pearson's chi-square test for independence and rank-biserial correlation

The cross-tabulation in Appendix 6 shows the frequency distribution of country-years according to 'coup attempt' and 'regime type'. Democracies have the lowest relative frequency of country-years where at least one coup was attempted out of all regime types (9.68%), followed by closed anocracies (13.71%), then open anocracies (18.55%) and finally autocracies (58.06%). Only 6.28% of democratic country-years have seen at least one coup attempt, while 19.2% of autocratic country-years have seen at least one coup attempt.

The Pearson's chi-square test statistic to test for independence between the two categorical variables is given as:

$$\chi^2 = N \sum_{i,j} p_i * p_j ((O_{i,j} / N) - p_i * p_j) / (p_i * p_j)^2 \quad \forall i = 1(1)r, j = 1(1)c$$

Where r is the number of rows (in this case, 2) and c is the number of columns (in this case, 4) in the two-way contingency table. Here, $O_{i,j}$ is the number of observations in the i^{th} row and j^{th} column. N is the total number of observations (867). Finally, p_i is the marginal relative frequency of row i

Are Non-democracies More Susceptible to Coups than Democracies in West Africa?

Written by Aditya Kurup

and p_j is the marginal relative frequency of column j

If the null hypothesis is true that the occurrence of a coup attempt is independent from the regime type in a country-year, then the test statistic follows a chi-square distribution with $(r-1)(c-1)$ degrees of freedom (which is equal to 3 in this case). Here, the Pearson's chi-square test statistic is high enough that we can reject the null hypothesis that the occurrence of a coup attempt is independent of regime type at all conventional levels of significance.

However, the Pearson's chi-square test does not provide any information on the magnitude and direction of the relationship between the two variables. The rank-biserial correlation coefficient, which is a special case of the Somers' D measure, is an index of association between a binary nominal variable (coup attempt) and an ordinal categorical variable (regime type). The measure is calculated as:

$$r_{rb} = (NC - ND) / (NC + ND + NT)$$

Where,

$NC=303*17+303*23+303*12+148*23+148*12+113*12=22292$ is the number of concordant pairs

$ND=72*148+72*113+72*179+17*113+17*179+23*179=40761$ is the number of discordant pairs

$NT= (743*124)- NC- ND=29079$ is the number of tied pairs

Thus, $r_{rb} = -0.20046238$. This suggests that there is a moderate, negative association between the occurrence of at least one coup attempt in a country year and the regime type.

The statistical analyses provide sufficient evidence that democracies are more resilient to coups than anocracies and autocracies in West Africa. The greater the quality of democracy, the less is the likelihood of a coup attempt in this sub-region.

Conclusions

This paper validates the existing literature on the effects of ethnic fractionalization, economic progress and military resourcefulness on the likelihood of a coup attempt occurring in West Africa. However, the susceptibility of democracy to military coups on a global scale continues to remain an empirical quandary, given the divisive nature of the literature exploring this specific relationship. It is critical to note, however, that the findings of this paper are consistent with similar studies done in the entire Sub-Saharan Africa region. While a global prescription may not be empirically substantiated, it is clear that the antidote to the incessant regime changes and military supremacy in this

Are Non-democracies More Susceptible to Coups than Democracies in West Africa?

Written by Aditya Kurup

sub-region is democratization. The first step to bring in democracy would be to mend the tainted civil-military relations. Both civil leaders and the military must make concerted efforts to understand their roles in national service and security. There is also a need to normalize the condemnation of military intervention into politics as undemocratic. Economic development and social cohesion amongst ethnic groups are also imperative to ensure political stability and sustained democratization of the sub-region.

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Are Non-democracies More Susceptible to Coups than Democracies in West Africa?

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Appendix 1

Periods of Each Regime Type in Each Country from 1958-2018

Graph 1

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Source: Compiled by author from the Polity IV dataset

Graph 2

Source: Compiled by author from the Polity IV dataset

Graph 3

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Source: Compiled by author from the Polity IV dataset

Graph 4

Source: Compiled by author from the Polity IV dataset

Appendix 2

Ghana's Polity Score and Coup Attempts (1960-2018)

| Year | Polity Score | Coup Attempt |
|------|--------------|--------------|
| 1960 | 8 | 0 |
| 1961 | 8 | 1 |
| 1962 | 9 | 0 |
| 1963 | 9 | 0 |
| 1964 | 9 | 0 |
| 1965 | 9 | 0 |
| 1966 | 7 | 1 |
| 1967 | 7 | 1 |
| 1968 | 7 | 0 |
| 1969 | 7 | 0 |
| 1970 | 3 | 0 |
| 1971 | 3 | 0 |
| 1972 | 7 | 1 |
| 1973 | 7 | 0 |
| 1974 | 7 | 0 |
| 1975 | 7 | 0 |
| 1976 | 7 | 0 |
| 1977 | 7 | 0 |
| 1978 | 0 | 1 |
| 1979 | 6 | 1 |
| 1980 | 6 | 0 |
| 1981 | 7 | 1 |
| 1982 | 7 | 1 |
| 1983 | 7 | 1 |
| 1984 | 7 | 1 |
| 1985 | 7 | 0 |
| 1986 | 7 | 0 |
| 1987 | 7 | 0 |
| 1988 | 7 | 0 |
| 1989 | 7 | 0 |
| 1990 | 7 | 0 |
| 1991 | 4 | 0 |
| 1992 | 1 | 0 |
| 1993 | 1 | 0 |
| 1994 | 1 | 0 |
| 1995 | 1 | 0 |
| 1996 | 2 | 0 |
| 1997 | 2 | 0 |
| 1998 | 2 | 0 |
| 1999 | 2 | 0 |
| 2000 | 2 | 0 |
| 2001 | 6 | 0 |
| 2002 | 6 | 0 |
| 2003 | 6 | 0 |
| 2004 | 8 | 0 |
| 2005 | 8 | 0 |
| 2006 | 8 | 0 |
| 2007 | 8 | 0 |
| 2008 | 8 | 0 |
| 2009 | 8 | 0 |
| 2010 | 8 | 0 |
| 2011 | 8 | 0 |
| 2012 | 8 | 0 |
| 2013 | 8 | 0 |
| 2014 | 8 | 0 |
| 2015 | 8 | 0 |
| 2016 | 8 | 0 |
| 2017 | 8 | 0 |
| 2018 | 8 | 0 |

Note: "Coup attempt" is a dichotomous measure which assumes the value 1 if a coup attempt occurred in that country year (regardless of whether it was a plot, failed attempt or success)

Appendix 3

Appendix 4: Are Non-democracies More Susceptible to Coups than Democracies in West Africa?

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Model 1: Random-effects logistic regression

| Coup | Coef. | St.Err. | t-value | p-value | [95% Sig | ConfInterval] |
|------|--------------------|----------|------------------|---------|--------------------|---------------|
| Auto | 2.7581 | 1.1252 | 2.49 | 0.131 | 246.135** | closed_ano |
| | 2.069 | 0.8931 | 2.31 | 0.02 | 8884.82* | open_ano |
| | 3.8751 | 1.8782 | 2.06 | 0.04 | 1051.499 | 10.016*** |
| | GDPPC | 0.9990 | -1.98 | 0.047 | 9981** | EF |
| | 3.2155 | 2.010 | 1.60 | 0.11 | 13576.582 | MS |
| | 1.239 | 0.773 | 1.60 | 0.11 | 10971.4*** | Constant |
| | 0.28 | 0.039 | -2.60 | 0.009 | 0.002 | 415*** |
| | Constant | -13.5746 | 6.23 | b.b | -104.9577 | 81 |
| | Mean dependent var | 0.151 | SD dependent var | 0.358 | Number of obs | 688 |
| | Chi-square | 30.627 | Prob > chi2 | 0.000 | Akaike crit. (AIC) | 565.563 |

*** $p < .01$, ** $p < .05$, * $p < .1$

Model 2: Conditional fixed-effects logistic regression

| Coup | Coef. | St.Err. | t-value | p-value | [95% Sig | ConfInterval] |
|------|--------------------|-----------|----------------------|---------|---|---------------|
| Auto | 2.7671 | 1.1962 | 2.35 | 0.019 | 1856.457** | closed_ano |
| | 2.2521 | 0.561 | 4.01 | 0.000 | 73.083 | 8995.644* |
| | 3.3711 | 1.6962 | 1.99 | 0.047 | 10161.25 | 89.035** |
| | GDPPC | 0.9990 | -1.73 | 0.084 | 9981* | EF |
| | 1.722e+10 | 1.952e+11 | 2.08 | 0.038 | 3.8667 | 671e+19** |
| | MS | 1.21 | 0.092 | 0.56 | 0.11 | 0.461 |
| | Mean dependent var | 0.151 | SD dependent var | 0.358 | Pseudo r-squared | 0.054 |
| | Number of obs | 688 | Chi-square | 27.402 | Prob > chi2 | 0.000 |
| | Akaike crit. (AIC) | 494.262 | Bayesian crit. (BIC) | 521.465 | *** $p < .01$, ** $p < .05$, * $p < .1$ | |

Appendix 5

Hausman (1978) specification test

Coef. Chi-square test value 11.969 P-value .035

Variance Influence Factors of independent variables

Variable VIF Auto 3.43 closed_ano 2.26 open_ano 1.47 GDPPC 2.58 EF 7.19 MS 2.64 Mean VIF 3.26

Appendix 6

Tabulation of Coup Regime

| Regime | Coup | Autocracy | Closed | Anocracy | Open |
|-----------|--------|-----------|--------|----------|--------|
| Total | 303 | 148 | 113 | 179 | 743 |
| Autocracy | 40.78 | 19.92 | 15.21 | 24.09 | 100.00 |
| Democracy | 80.80 | 89.70 | 83.09 | 93.72 | 85.70 |
| Total | 172 | 172 | 231 | 212 | 24 |
| Autocracy | 58.06 | 13.71 | 18.55 | 9.68 | 100.00 |
| Democracy | 19.20 | 10.30 | 16.91 | 6.28 | 14.30 |
| Total | 375 | 165 | 136 | 191 | 867 |
| Autocracy | 43.25 | 19.03 | 15.69 | 22.03 | 100.00 |
| Democracy | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

Pearson Chi2 = 20.27 Prob = 0.0001

Note: First row has frequencies; second row has row percentages and third row has column percentages

[1] http://www.uky.edu/~clthyn2/coup_data/home.htm

[2] <https://www.systemicpeace.org/inscrdata.html>

[3] <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

[4] <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi%3A10.7910%2FDVN%2F4JQRCL>

[5] <https://www.sipri.org/databases/milex>