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**The Evolution of Power: Determining the Impact of
Formal Education on African Presidents' Survival in
Power**

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Major paper presented to the department of Economics of the University of
Ottawa in partial fulfillment of the requirements of the M.A Degree.

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Ottawa, Ontario
April 11th, 2014

Abstract

This paper investigates the effect of individual characteristics of African leaders, particularly their highest earned degree, on their chances of survival in power. Using a unique database constituted solely for the purpose of this paper, it shows how the profile of African leaders has changed since 1960. Results indicate that overall, individual characteristics of African leaders have no impact on their chances of survival in power. Meanwhile, the introduction of democracy and multiparty elections on the African continent post-1990 has had an impact on the political selection of leaders on the continent. Since 1990 Africa has mainly been governed by at least college educated leaders, but results indicate that non-college educated leaders have increased chances of survival in power when compared to educated presidents, indicating that post-1990 there has been a persistence of non-college educated leaders in power.

Keywords: *Political Selection, Africa, Democracy, Event History Analysis*

Résumé

Ce mémoire étudie les effets des caractéristiques individuelles des présidents Africains, particulièrement l'effet de leur plus haut diplôme obtenu, sur leurs chances de survie au pouvoir. Utilisant une base de donnée créée uniquement dans le cadre de ce projet, ce mémoire indique comment le profil des présidents africains a évolué depuis 1960. Les résultats démontrent que dans l'ensemble, les caractéristiques individuelles des présidents Africains n'ont aucun impact sur leurs chances de survie au pouvoir. Cependant, l'introduction de la démocratie et du multipartisme sur le continent Africain post 1990 ont eu un impact sur la sélection politique du continent. Les résultats indiquent qu'après 1990, l'Afrique a été majoritairement gouverné par des présidents ayant un niveau d'étude plus élevé, mais, que ce sont les présidents ayant un niveau d'étude moins élevé qui ont plus de chances de survie au pouvoir. Cela indique, que post 1990, il y a une persistance de leaders moins éduqués au pouvoir sur le continent africain.

Mots-Clés: *Sélection Politique, Afrique, Démocratie, Analyse Historique d'Évènements*

Dedication

This Major Paper is dedicated to my mother, Dorothee Yvette Constance de Souza de Medeiros (1946 – 2013).

Acknowledgement

First, I would like to thank my family for their support and encouragements during this Master's Program at the University of Ottawa. The last two years have been challenging on many levels for me and their support during this time has been crucial towards my success. I would particularly like to thank Gaston de Medeiros, Gil de Medeiros, Florence Médenou as well as Régina Hounkponou for their help during this period. I would also like to thank my friend Ryssa Ndabihore for her support and help during this program.

I would further like to gratefully thank Professor Roland Pongou for his time and advice. Weekly meetings with him have been precious for me. I am grateful to have learned so much at his side. I would also like to gratefully thank my friends, Paul Henry Aboua, Swola Tanko, Cheikh Amar, Arsene Bationo, Kelvin Omoregie, Reda Benazzouz, Diane Dessables and Salomon Compaore, as well as all my friends from the department of Economics of the University of Ottawa. Furthermore, I would also like to thank professor Yasid Dissou for his comments.

Last, but not least, I would like to thank all the professors that have taught me at the University of Ottawa. Completing my course of study here has helped me develop as a person and I will carry with me the knowledge I have acquired from this degree for the rest of my life.

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1. Introduction

The role of political leaders in influencing event outcomes has always been subject to great debate. From Marx (1852) that identifies political leaders as having little influence on history, to Carlyle's (1859) 'Big Man Theory', in which he identifies history's outcome to be determined by the charisma and the political intelligence of leaders, one can ponder the 'real' effect of political leaders on history. Besley (2005) identifies that many problems of government, particularly in emerging democracies, concern political leaders using the state for self-dealing. Hence, finding the right leaders becomes key. Political selection by using institutional constraints attempts to influence the leaders who arrive to power. Weber (1947) identifies an interaction between the national bureaucracy, traditional social norms and the leader. He states that if the national bureaucracy and social norms are weak, the leader has more influence on policy outcomes. Meanwhile, institutional constraints have sometimes proven to be limited in their effect, particularly when leaders intend to use the state for self-dealing. Today, many autocratic leaders around the world show contempt for the institutional constraints in place.

The economic literature has shown the positive effects of education on an individual, both in terms of revenue and civic behavior¹. With works done in the management sector on CEO identity and firm performance, Bertrand and Schoar (2003) show that random shocks to CEOs affect firm performance, identifying the importance of the CEO in a firm in determining strategy. Using a similar approach, Jones and Olken (2005) and Besley, Montalvo and Reynal-Querol (2011) show that leaders matter, particularly in autocratic

¹ The effect of education on revenue has been shown by Card (1997). Dee (2004) and Milligan et al. (2004) demonstrate that education affects measures of citizenship such as charitable giving.

regimes where random leadership transitions have proven to be associated with larger changes in growth when compared to democracies.

Political selection is important for two reasons. “First, if there are limits of the degree to which individuals can credibly adopt policy positions, then who is picked for public office is instrumental to adopting a credible policy stance. Second, if the control of politicians through elections is limited, then improving the quality of government requires an increase in honesty, integrity, or competence of those who are elected” (Besley 2005). As such, education, being seen as a measure of civic behavior can affect the behavior of an individual in political office.

This paper, basing itself on the African experience, investigates for the effect of individual characteristics of African leaders on their survival time in power, particularly the effect of the highest earned degree of African leaders on their survival in power. The African continent is of interest due to the fact that it has had many leaders with very different characteristics. Leaders on the continent have also had very different views concerning leadership. How can one attempt to explain that while some leaders spend a year in office others spend more than 40 years in office? The African continent has also had numerous military leaders, in various political systems. This paper attempts to summarize the profile of African leaders and observes whether leaders holding certain characteristics increase their chances of survival in power.

Following 1990 and the summit of ‘La Baule’, Africa’s political structure took a new direction with Roland Dumas, French Foreign Affairs Minister at the time, stating, “The wind of liberty blowing from the East will eventually blow in the direction of the South ... There is no development without democracy and there is no democracy without

development” (Rohan, 2011). Hence, this paper also examines the impact of leader characteristics pre and post-democratization of the African continent in order to examine how the introduction of democracy in African politics has influenced African leaders’ survival time in power.

Through a series of descriptive statistics, this paper observes the individual characteristics of African leaders from 1960 to 2011. Of the 239 African leaders evaluated, this paper records 107 leaders who had earned a high school diploma as their highest earned degree, 61 who had earned a college/bachelor degree as their highest earned degree and 71 leaders who had earned a master’s/Ph.D. as their highest earned degree. The evolution of individual leader characteristics seems to show two distinct tendencies on the African continent: a pre-1990 tendency and a post-1990 tendency. This paper observes that post-1990 there has been a change in the individual characteristics of leaders, with more educated leaders arising to power, as well as a decrease in the number of coups/putsch on the continent. These findings confirm that the introduction of democracy and the first multiparty elections in 1990, whether successful or not, have had an impact on the political selection of leaders on the African continent. For instance, post-1990 there has been an increase in African leaders with higher educational attainments. As such, in 2011, around 60% of African presidents had at least a college degree or more as their highest earned degree.

Concerning the main empirical framework, this paper adopts a discrete time survival analysis approach in order to measure the impact individual characteristics of African presidents can have on their survival time in office. As such, Kaplan-Maier survival curves are presented in order to analyze the survival times of African presidents in power

depending on some of their individual characteristics, as well as Nelson-Aalen cumulative hazard curves illustrating risk associated with being in office for African presidents.

The results of the regression analysis show that overall, education has no impact on the survival time of African leaders in office, implying that the chances of survival in office of educated and non-educated leaders are the same once in office. Meanwhile, when controlling for the effect of education on survival time of African leaders following 1990, it is observed that leaders with at least a college degree as their highest earned degree have around three times the odds to depart from office the following year when compared to less educated leaders. These results show that the introduction of democracy and the first multiparty elections in 1990 have changed the profile of political leaders on the African continent, with more educated leaders arriving to power. Meanwhile, results indicate that there seems to be a persistence of non-college educated leaders that remain in power. These results indicate the importance the introduction of multiparty elections has had on the political selection of leaders on the African continent, with the profile of leaders significantly changing post 1990.

This paper is organized in the following manner: Section 1.1 presents a brief historical context of the situation on the African continent from 1960 to today; Section 2 presents a brief literature review on how education impacts political selection as well as economic performance; Section 3 presents the main econometric framework as well as the different specifications used in this paper; Section 4 presents the dataset used in this paper as well as a series of descriptive statistics and trends on the evolution of individual characteristics of African presidents; Section 5 presents the results from the main econometric framework, while Section 6 concludes this paper.

1.1 Background

In order to understand how education can impact African leaders' survival time in power, the context in which such leaders rule is determinant. Inspired by the observations of Mamadou Gazibo in his book *Introduction à la Politique Africaine* (2006), I attempt to comprehend the African political scene in order to understand how African political structures can impact leaders' survival time in power. The following passages attempt to explain how decolonization processes on the African continent have influenced leader selection following independence, as well as identifying the common characteristics of African regimes from 1960 to 1990. Following 1990 and the summit of 'La Baule', multiparty elections were reintroduced on the African continent. Using Van de Walle's regime classification of countries post-democratization as a guideline (Van de Walle, 2002), this background attempts to measure the impact the introduction of democracy had on changing the African political sphere.

1.1.1 From Independence to Authoritarian Regimes (1960-1990)

In his book *Introduction à la Politique Africaine*, Mamadou Gazibo (2006) identifies that there exists a strong correlation between the mode of decolonization and the types of regimes that followed immediately after the independence of many countries. Countries such as Algeria, Angola, Mozambique, Cape-Verde and Guinea-Bissau all suffered wars in order to obtain independence. As a result, emerging political leaders in such countries were generally from armed groups that had fought the colonial power. When these groups took charge, they immediately installed authoritarian regimes. In Algeria, the example of the Front of National Liberation (FNL) best illustrates this trajectory. Gazibo identifies that

countries that suffered rushed decolonization processes, that is, decolonization processes that were not organized, such as the Zaire, quickly turned into anarchic states. Gazibo (2006, p. 86) quotes Weiss (1987, p. 14) who observes that, "Zaire was one of the first African states to suffer a mutiny from the army; it is also the African country that suffered the first secession attempts, as well as being one of the first African countries to have independent mercenaries and a coup that brought Mobutu to power for thirty years".

Meanwhile, most African countries accessed independence through a pacific negotiation with their colonial power. The French and British colonies best illustrate this tendency. As such, following independence, many African countries adopted a pluralist parliamentary model. Chazan, Lewis, Mortimer, Rothchild and Stedman (1999, p. 43) demonstrate that the formal institutional structures inherited by African countries following independence were of exogenous nature and authoritarian, as well as being conceived to insure domination. Because of this, many African leaders in power quickly suppressed such systems in order to establish personal autocracies. A result of this was the creation of the unique party that has been described as an "efficient instrument of mobilization" (Gazibo, 2006, p. 88). This also allowed for the rise of military in politics, like in the Congo and in Togo, where militaries took power and established authoritarian regimes.

With the exception of pluralist and the apartheid regimes, one can find common characteristics in African regimes from 1960 to 1990. Gazibo (2006) identifies three such characteristics. First, African regimes of the time faced a legitimacy problem. Second, African countries faced authoritarian tendencies. Third, African regimes of the time were also characterized by a military domination (p. 100). J. Lagoye (1985) points out that a

leader's legitimacy cannot be reduced to only the legal aspects of his actions but rather lies in the acceptance of his population and non-political elites (p. 397). With leaders lacking legitimacy, many African leaders turned to force. Force became a method for African leaders to maintain themselves in power. Gazibo points out that many leaders would weaken formal institutions and civil society in order to develop parallel networks based on the principle of loyalty (p. 101). African regimes from 1960 to 1990 were characterized by the omnipresence of the military. Samuel Decalo (1998, p. 2) finds that by 1990 around 60% of Africa's population lived under some form of military government. To discuss one type of military regime would be faulty, as military leaders found themselves at the head of different types of regimes. For instance, military leaders have been at the head of Ghana and Burkina Faso, both classified as populist regimes. Afro-Marxist regimes such as the ones observed in Benin and Ethiopia were also governed by military (Chazan et al., 1999, p. 140). By the 1980s many African regimes faced economic challenges as well as a political failure of authoritarian governments. The democratic wave that followed on the African continent was described as a second independence for many African countries.

The reasons for Africa's switch to democracy are subject to debate. Is the transition to democracy due to internal or external pressures? Many authors find that external pressures are insufficient to explain Africa's transition to democracy (Bratton and Van de Walle, 1997). Others, like Young (1999), believe it is a mix of internal and external conditions that made Africa opt for democracy (p. 23). More skeptical authors like Akindes (1996) see Africa as having no choice but to adopt democracy due to high debt and economic dependence towards Africa's lenders. Even though it is difficult to agree upon the reasons why Africa may have opted to switch for democracy, it seems that the end of the

Cold War marked a new page in Africa's history with the end of a bipolar geopolitical situation, which the leaders of the continent had used to their advantage.

1.1.2 Africa's Democratic Transition: A Mixed Experience (1990-2011)

No matter the reasons for Africa's switch to democracy, the question remains: what impact did democracy have on the African continent and political selection? Gazibo (2006) describes democracy as an answer to the continent's governance issues. He views democracy as being essential in insuring civil liberties and in ending authoritarian practices that had been omnipresent in the African political sphere (p. 208).

Nicolas Van de Walle (2002) offers a classification of African regimes in the 1990s. He proposes two criteria in order to evaluate the result of African transitions towards democracy. He considers the results of the first elections following the democratic transition as well as the degree of competitiveness of the first democratic elections. He concludes that countries that changed leaders following the first democratic elections, as well as countries in which a strong opposition existed during the first elections, had better democratic perspectives. Following his conclusions, he offers four regime classifications in Africa. These include countries experiencing a *status quo* regroup, in which the first elections did not allow either the leader in office to leave or allow for a competitive opposition. Such countries include Burkina Faso, Djibouti, Gabon and Mauritania. On the other hand, *consolidated democracies* also emerged following the first elections. Countries like Benin, Malawi, and Sao-Tome and Principe illustrate countries in which the first elections allowed for a regime change due to the competitiveness of the election. Van de

Walle identifies two other regimes, which have been subject to many criticisms. For instance, he defines *contested autocracies* such as Cameroon, Chad, Kenya and Togo. In such countries, the leader has remained the same but the majority party has not been able to stop opposition from creating a parliamentary opposition. The fourth regime classification is what Van de Walle calls *executive dominant* regimes. He classifies countries such as Mali, Namibia, South Africa and Zambia in this category. In such a regime, the first elections brought a real change upon the political sphere but meanwhile, elections brought to power a party that considerably dominates all others.

Van de Walle's regime classification (2002) has not been accepted by all. Gazibo (2006) identifies that the distinction between the *executive dominant* category and the *consolidated democracy* category is not clear (p. 216). For instance, according to the Freedom House Index (2006), Mali, Namibia and South Africa are considered *consolidated democracies*. Van de Walle's *status quo* category has also been subject to criticism as he recognizes that even in imperfect situations, the introduction of civil liberties as well as competitiveness mechanisms bring about perspectives of change that only time will allow to be put in place (Gazibo, 2006, p. 216).

Adejumobi (2000) highlights that the African democratic experience has obtained mixed results. He insists that rather than focusing on the form of democratic multiparty elections, one should focus on the nature of such elections. Adejumobi (2000, p. 71) states that some: "contend that what is happening in Africa is a mere 'smokescreen' and not a real manifestation of democracy, for to identify democracy with multipartism and elections is simply a caricature and devalues democracy" (Ake, 1991, 1995; Beckman, 1989; Ihonvbere, 1996; Nzongolo Ntalajo and Lee, 1997). Even though democracy has not reached a

consensus in Africa, Adejumobi says that many describe democracy in Africa as being a “messy, rough and slow process that only time will allow to grow and mature” (Diamond, 1989; Ibrahim, 1995).

This brief background, mainly inspired from the findings of Gazibo (2006), is essential in helping to shape the context in which leaders on the continent have exercised power. Weber (1947) identifies that the fact that the national bureaucracy and the traditional social norms were weak in many African countries has allowed leaders on the continent to be able to be more influential. Following the introduction of the first multiparty elections in 1990, the political context on the African continent changed, as observed by Van de Walle. Even if some leaders prior to 1990 remained in power post-1990, they faced more opposition and a different international context, which could have affected their survival in power. Meanwhile, it is to be seen if this change of context observed on the African continent can have an effect on the survival time in power of leaders.

2. Closely Related Literature

The goal of this paper is to explore the impact of education of African leaders on their survival time in power. Do more educated leaders have more chances of survival in power when compared to less educated leaders? Besley (2005) identifies that the improvement of the government requires leaders with qualities such as honesty, integrity and competence. Therefore, according to Besley, the political selection of leaders is of great importance.

Education, in economic literature, has proven to be strongly correlated with an individual's income (Card, 1997), but recently education has proven to also have civic

returns for individuals. Milligan, Moretti and Oreopoulos (2004) identify education as an essential tool in providing individuals with the necessary cognitive skills to participate in a representative democracy. If they recognize that measuring civic returns is not evident, Milligan et al. test the relationship between education and civic participation in the U.S and the U.K., measured by the probability of voting, as well as testing the impact of education on other measures of political participation, including the probability of attending political or community meetings, as well as political activeness. Using an instrumental variable strategy to account for the unobserved characteristics of individuals that may affect schooling and political participation, Milligan et al. find that there exists a positive effect of education on voting in the U.S., to the contrary of the U.K., where education seems to not be a significant factor in analyzing political participation. The authors point out that in the U.S. the effect is mainly due to differences in voting registrations across education groups.

Results also indicate the positive relationship between education and civil behavior, illustrating that more educated individuals tend to be more likely to discuss election campaigns as well as being more politically active. Dee (2004), using a similar approach to Milligan et al. (2004), estimates the effect of additional years of schooling on adult voting behavior and volunteer participation, as well as estimating the effects of additional schooling on the frequency of newspaper readership, identified by Dee as being a close measure to civic awareness. Results indicate the positive relationship between additional schooling years and voter participation as well as identifying a statistically significant result between additional schooling and the increased frequency of newspaper readership.

If education has shown to have economic and civic returns for individuals, can one assume that education increases a leader's integrity and competence? In attempting to

measure leader importance, Jones and Olken (2005), inspired by works on CEO leadership on firm performance (Johnson, Magee, Nagarajan and Newman, 1995; Bertrand and Schoar, 2003), attempt to explain how a leader's education can impact economic growth. Using death of leaders while in office to account for exogenous variations in leadership, they question whether exogenous leadership transitions are associated with shifts in country growth rates. Using leaders' random deaths allows for Jones and Olken (2005) to control whether leaders have an impact on growth. Using data on 57 leaders who died naturally or through an accident, Jones and Olken (2005) find robust evidence that leaders are significant for growth. Jones and Olken (2005) also find evidence that regime type matters when determining the impact of a leader on growth. They find that death of leaders in autocratic regimes has an impact on growth, while death of leaders in democratic regimes seems to have no such effect on growth.

Expanding on the dataset used by Jones and Olken (2005), Besley, Montalvo and Reynal-Querol (2009) investigate whether the impact of a leader's education is strong enough in order to explain growth. Evidence from Besley et al. (2009) shows that like Jones and Olken (2005) find, leader identity is important as well as having an impact on economic growth.

If education has proven to have a positive impact on individual and leader economic and civic behavior, it is important to make sure that only the most competent candidates succeed in holding power. Besley and Coate (1997) as well as Osborne and Slivinski (1996) have modeled political selection as a game between citizens competing to hold public office. Using a candidate-citizen approach like the one defined above, Caselli and Moretti (2004) identify the factors that may influence the supply of 'bad' politicians. Incomes politicians

can earn while in office as well as imperfect information can all influence the supply of 'bad' politicians. Using a tractable model of dynamic political selection, Acemoglu, Egorov and Sonin (2010) find that the main barrier in selecting 'good' politicians lies in the incumbency veto power of current governments. Acemoglu et al. demonstrate that a small degree of incumbency veto power can result in the persistence of highly inefficient leader selection. Meanwhile, aside from perfect democracy, Acemoglu et al. find all other forms of government lead to inefficient leader selection and can result in the persistence of 'bad' politicians in public office.

If Acemoglu et al. (2010) show that democracies are the only efficient method to select 'good' leaders as all other systems prove inefficient, Besley and Reynal-Querol (2011) attempt to analyze the impact of democracies on leader selection by questioning if democracies select more educated leaders than non-democracies. They find evidence to support the fact that political selection differs between democracies and non-democracies, with democracies selecting leaders around 25% more likely to be more highly educated than non-democracies. They also show that in both autocracies and democracies less educated leaders tend to be chosen in times of political instability, as well as by the militaries.

2.1 Theory

The background and the above literature review have helped to understand the political situation on the African continent from 1960 to present and have helped identify related literature on the impact of education on civic behavior. But the main question of analysis that needs to be understood is how should education impact survival time of African leaders in power? If assumed that African leaders each have a set of individual

characteristics, such as their age, education or religion that can influence their survival time in power, then how should individual leader characteristics affect survival time in power of African leaders?

Education has proven to be positively correlated with measures of citizenship. As such, education of leaders can be viewed as a method to increase government quality. In the African case, weak institutions and high incomes as well as imperfect information as defined above could be used to explain the selection and the 'persistence' of highly inefficient governments in office, especially pre-democratization. Less educated leaders will also be more likely to want to remain in power as they lack the skillset required to earn more elsewhere. As such, they rely on the state to affirm their power. More highly educated leaders have more options as they have acquired skills that can easily be transferred elsewhere. As a result, remaining in power is less imperative for more educated leaders as they have more options available. Therefore, in the presence of weak institutions and high incomes, it is expected that less educated leaders will remain longer in power as they can more easily shape the state's political institutions to remain in power.

Acemoglu et al. (2010) have identified democracy as being the only efficient method to select 'good' leaders as all other systems result in inefficient selection. Besley and Reynal-Querol (2011) add to those findings by demonstrating that democracies select more educated leaders than non-democracies. This study approaches the question in a new light and attempts to use a discrete survival analysis model to measure if following the introduction of democracy on the continent post-1990 the chances of survival in power of more educated leaders increased on the African continent. From the findings of the above authors, it should be expected that chances of survival of educated leaders would increase

post-democratization, while the chances of survival in power of less educated leaders prior to democratization would be better, not because there was a lack of 'good' leaders but due to the incumbent veto power of governments in place at the time.

3. Econometric Investigation

This section presents the econometric modeling framework. The econometric technique implemented in this paper is based on a logit discrete duration time model. The reasons for using such a model are many. Even if using an Ordinary Least Square (OLS) model would allow one to obtain estimates of the effects of individual characteristics of African leaders that did not change over time, such a model would present numerous statistical issues. For instance, using an OLS model would not allow one to estimate the impact of variables that change over time without an aggregation bias as well as having issues accounting for African leaders still in power (censoring). Using an OLS model could also result in predicting negative tenures.

It has been shown that discrete time duration models can be estimated using a standard binary choice model, such as logit. However, logit regression results have been shown to be consistent but inefficient in the presence of time dependency. It occurs that in such a case standard errors are wrong (Poirier and Ruud 1988). Using a traditional logit model assumes duration independence, which implies that the probability of a leader leaving office is always the same at any point in time. This turns out to assuming that the baseline hazard function is constant with respect to time. In order to take into account time dependency, a set of temporal dummy variables for each period or 'spell' will be used. This

amounts to being a time counter for each spell. As well as including 'spell' dummies, standard errors are corrected by using robust standard errors clustered on the identity of African leaders.

Sections 3.1 and 3.2 present two models that will be evaluated in this paper. First, Section 3.1 will estimate the overall impact of education on African leaders' survival time in power while Section 3.2 will estimate the impact of education of African leaders on their survival time in power pre and post-1990. The results of the regression analysis are presented in Appendix B with all the tables having four specifications. The first specification will observe the raw effects of education on survival time in power. The second specification will add upon the first by controlling for the effects of the education of African leaders as well as incorporating the temporal dummies defined above. The third specification adds upon specification (1) and specification (2) by controlling for a set of individual characteristics of African presidents such as age, religious belief and whether a president has accessed power through a coup/ putsch, while specification (4) adds upon specification (3) by controlling for the regional effects. For the sake of the analysis, six regions are considered: North Africa, West Africa, East Africa, Central Africa, Southern Africa and the islands surrounding the continent, such as Mauritius, Cape Verde or Madagascar, which are grouped together. Note that all specification measures correct for standard errors by using robust standard errors clustered on the identity of African leaders.

Results of the logistic regression are presented in the form of relative odd ratios, indicating the chance of an event to occur relative to a reference category. For the sake of this analysis, the following regressions indicate how much chances educated have to depart from power relative to non-college educated leaders. As well as presenting results in the

form of relative odd ratios, Tables B2, B4, B6 and B8 present results in the form of marginal fixed effects. Marginal fixed effects allow for a more precise interpretation of results as they provide an approximation to the amount of change in departures from office that will be produced by a one percent change in individual characteristics of African leaders. For the marginal fixed effects, only specification (4) is evaluated.

3.1 Estimating the Impact of Education on African Leaders' Survival Time

In order to evaluate the impact of the highest earned degree of African leaders on their survival time in office, it is important to start by letting the hazard rate be conditional on covariates as well as survival, such that

$$h(t, X) = \Pr(T_i = t_i | T \geq t_i, X)$$

If the probability of an African president departing from office is defined as $\Pr(Y_{it} = 1) = \lambda_i$; and the probability of an African leader remaining in office is defined by $\Pr(Y_{it} = 0) = 1 - \lambda_i$, then it can then be assumed that the probability of African leaders departing from power is a function of their highest degree obtained as well as other individual characteristics such that

$$\lambda_{it} = \beta_0 + \beta_1 Educ_i + \gamma X_{2i} + \theta X_{3i}$$

where:

λ_{it} is the probability of African leaders departing from power. In this case, λ_{it} is a probability depending on the highest earned degree of African Presidents as well as other individual characteristics;

$Educ_i$ is a dummy variable indicating an African leader has received at least a College degree as his highest earned diploma;

X_{2i} : is a vector of individual characteristics of leader i , which includes whether a leader has arrived through a coup/putsch, his religious beliefs and his age upon arrival in office. This accounts for controlling factors in this regression. Depending on the specification used, the number of individual characteristics controlled for varies;

X_{3i} is a vector taking into account regions of Africa. For the purpose of this paper, six regions are used: North Africa, West Africa, East Africa, Central Africa, Southern Africa and the islands surrounding the continent grouped into one region. The region of West Africa is omitted and used as reference for other categories;

The $\hat{\beta}$'s denote the logit estimated coefficients, expressed as relative odd ratios, for a leader having received at least a college degree as his highest earned degree, relative to other leaders having received a high school degree as their highest earned degree. The greater the odd ratio, the higher the impact of the highest earned degree on length of stay in power. An odd ratio less than 1 is sometimes difficult to interpret. As a result, if an odd ratio is less than 1, for interpretation purposes, this paper changes the reference category by taking the inverse of the coefficient to obtain an odd ratio greater than 1;

$\hat{\gamma}$ denotes a vector of logit estimated coefficients for the individual characteristics of African presidents while $\hat{\theta}$ denotes a vector of logit estimated coefficients controlling for regional effects.

The logit model accounting for time dependency by using dummy variables can therefore be written as:

$$\Pr(Y_{it} = 1|X_{it}) = h(t, X_{it}) = \frac{e^{(\beta_0 + \beta_1 Educ_i + \gamma X_{2i} + \theta X_{3i} + \kappa_t - t_0)}}{1 + e^{(\beta_0 + \beta_1 Educ_i + \gamma X_{2i} + \theta X_{3i} + \kappa_t - t_0)}}$$

where $(\kappa_t - t_0)$ refers to the temporal ‘spell’ dummy variables. This model accounts for eight ‘spell’ dummy variables of four years each. These temporal dummies are the discrete time duration model equivalent of the continuous time baseline hazard function, $h_0(t)$. One advantage of using a logit model is the fact that results can be expressed in relative odds form. This indicates how a one unit increase in a covariate affects the relative odds of departing power in month t_i given survival up to the end of the previous month.

4.2 Estimating the Impact of Education on African Leaders’ Survival Time Pre and Post-Democratization

To account for the effect of education pre and post-democracy on the African continent, the same logit duration time model as above is used. The only difference in this model and the model presented above is the fact that this model accounts for the introduction of democracy by accounting for the year (1960 to 1989 versus 1990 to 2011). As such, Table B3 presents the effects of education of African leaders on their survival time in power prior to the introduction of democracy (that is, from 1960 to 1989) and Table B5 presents the effects of education of African leaders on their survival time in office following the introduction of democracy on the African continent (that is, from 1990 to 2011).

In order to check for the robustness of the results presented in Tables B3 and B5, another approach is used that takes into account the interaction between the highest earned degree of an African leader and the leader’s year of arrival in power. The logit model accounting for interactions between highest earned degree and the year of arrival in power can be written as:

$$\Pr(Y_{it} = 1|X_{it}) = h(t, X_{it}) = \frac{e^{(\beta_0 + \beta_1 Educ_i + \beta_2 Educ6090_i + \beta_3 Dtasce6090_i + \gamma X_{2i} + \theta X_{3i} + \kappa_t - t_0)}}{1 + e^{(\beta_0 + \beta_1 Educ_i + \beta_2 Educ6090_i + \beta_3 Dtasce6090_i + \gamma X_{2i} + \theta X_{3i} + \kappa_t - t_0)}}$$

Where

$Educ_i$: is a dummy variable indicating if an African leader has received at least a college degree as his highest earned degree,

$Educ6090_i$: is a dummy variable indicating an African leader had received at least a college degree as his highest degree before 1990,

$Dtascen6090_i$: is a dummy variable indicating whether an African leader arrived to office prior to 1990.

The control variables remaining are the same as the ones defined in Section 3.1.

4. Statistical Background

This section presents the dataset used in this paper, the restrictions as well as some summary statistics that describe how African leaders are characterized in the sample with respect to the relevant variable of analysis.

4.1 Data Source

This database is a unique dataset that was constituted to account for individual characteristics of African presidents from 1960 to 2011. It accounts for the 54 African countries starting from their date of independence, and for a large number of individual characteristics of African presidents prior to their arrival in power. For instance, this database gives information on African leaders' highest degrees obtained as well as the location in which they have acquired their military training, if any. Each president's age when accessing power is also a variable of consideration as well as the year of ascension to power and date of end of presidential term. The database also provides information on

presidents' religious beliefs as well as observing if presidents acquired power through a coup/putsch versus any other mode of ascension.

The dataset consists of individual characteristics of African presidents and does not take into account presidents who remained in power for less than half a year. For instance, Benin Republic is a country that has known many presidents with some such as Iropa Maurice Kouandete staying in power for a day. It is therefore difficult to evaluate the impact of the individual characteristics of such presidents on their length of stay in power. The main independent variable of interest — highest degree earned — is obtained by observing the highest degree a president has acquired. It is important to note that honorific diplomas are not taken into account in this database. Not all African presidents have received formal occidental education as some presidents have received Islamic or a military education. It is important to note that all presidents are assigned a level of formal education. If a president has not acquired western education or has not completed a high school diploma, he is accounted for as having a high school diploma or less as well as accounting for the other type of education attainments he may have.

This dataset consists of 2501 leaders years concerning 249 African presidents, with 15 African presidents having exercised power in two or more different time periods on the continent. For the purpose of this paper, monarchies are excluded from the sample. This is due to the fact that including monarchies creates a bias in the dependent variable length of stay. This results in ten leaders being deleted from the sample. Hence, the final sample size consists of 2339 observations concerning 239 African presidents from 1960 to 2011. The sample size pre-1990 consists of 1595 observations concerning 133 leaders, while the sample size post-1990 consists of 744 observations concerning 106 leaders.

4.2 Summary Statistics

Due to the length of certain tables, the summary statistics are presented in Appendix A. Table A1 shows means and standard deviations of length of stay of African leaders in power as well as the ages of African presidents when arriving in power. Table A2 indicates the individual characteristics of the 239 African presidents evaluated in this sample while showing distributions between the highest obtained diploma by African presidents and some relevant individual characteristics and Table A3 shows individual characteristics of African leaders prior to and post-1990. Figures A1 to Figure A5 present the evolution of African presidents' individual characteristics, such as arrivals by coup, length of stay in power or age at arrival in power. The main independent variable in this study is the highest degree obtained by African presidents. Table A2 indicates that of the 239 presidents evaluated, around 44% had a high school diploma as their highest diploma obtained while 25% had a college/bachelor degree and around 30% had a master's/Ph.D. as their highest degree obtained.

4.2.1 Length of Stay of African Presidents

The average African president tends to exercise power for around 10 years. When controlling for various individual characteristics of African presidents, it is expected that the average length of stay in power will change by consequence. For instance, African presidents having a high school diploma or less are expected to stay in power longer on average than presidents having a college/bachelor degree or master's/Ph.D. degree. Presidents having a high school diploma or less are observed to stay in power around 11 years on average, compared to about 10 years in power on average when they hold a college/bachelor degree. African presidents are observed to stay on average 8 years in

power when they hold a master's/Ph.D. degree. By looking at Table A1, it is observed that the standard deviation of average length of stay in power of African presidents is more volatile for presidents having a high school diploma. Like African presidents having a high school diploma, militarily educated presidents are observed to exercise power on average 11 years, also with a more volatile standard deviation. This is due to the fact that of the 111 leaders having obtained a high school diploma as their highest diploma, 81 are militarily educated.

The method of arrival to power can also impact the average length of stay in office of African presidents. Table A1 shows that presidents arriving in power by a coup/putsch tend to stay in power on average 10 years, with a more volatile standard deviation than African presidents not arriving by coup.

Table A2 indicates that of the 239 presidents evaluated, 60% of African presidents evaluated exercised power for 10 years at most and around 15% of African presidents exercised power for more than 20 years. Three African presidents stand out as having maintained power for more than 35 years: Omar Bongo of Gabon and General Muammar Gaddafi of Libya both maintained power for 42 years, while Etienne Gnassingbe Eyadema of Togo maintained power for 38 years, with all three presidents having received a military education.

When looking at the effect of the highest degree obtained by African presidents on their length of stay in power, Table A2 shows that African presidents whose highest level of formal education is high school tend to stay in power longer, as 55% of African presidents exercising power for more than 20 years had a high school diploma or less as their highest degree obtained. This, by theory, should closely coincide with the length of stay of militarily

educated presidents. From Table A2 it is apparent that 51% of African presidents who stayed in power for 20 years or more were militarily educated. Around 43% of African presidents who stayed in power for 20 years or more had a high school diploma as their highest formal degree obtained and were militarily educated. On the other hand, around 41% of African presidents having a high school degree as their highest degree obtained remained in power for a maximum length of stay of 10 years.

When looking at presidents having a college/bachelor degree or master's/Ph.D. as their highest formal degree obtained, it is observed from Table A2 that 85 out of 143 of African presidents who stayed in power at most 10 years had at least a college diploma while 46% of African presidents with at least a college degree stayed in power 20 years or more. When looking at Table A3, it can be seen that presidents arriving in power prior to 1990 did tend to remain longer in power, as 10 leaders are identified as having stayed in power for 30 years or more. Meanwhile, post 1990, only six leaders are identified as having spent 20 years or more in office. The general trend shows that the highest degree obtained by African presidents seems to have an impact on their length of stay in power, as descriptive statistics show that presidents with a high school diploma or less tend to stay in power longer.

By looking at the evolution of the Mean Length of Stay of African Presidents from 1960 to 2011, Figure A1 shows that depending on the time period in which they arrived in power, the length of stay of African presidents does offer a lot of variation. For instance, Figure A1 shows two types of curve: an ascending curve from 1960 to 1990 and a downward curve from 1990 to 2011. The curve reaches a maximum in 1990 where the average length of stay of African presidents is around 22 years in power. From 1960 to

1990, the rise of authoritarian regimes along with the instauration of the unique party in many African countries may be factors that contributed to presidents remaining longer in power. Following the end of the Cold War and the introduction of democracy, it seems that the average length of stay of African presidents started to decrease.

4.2.2 African Presidents and Coups/Putsch

Since 1960 Africa has been a continent that has suffered numerous coups/putsch. The reasons for African presidents to access or seize power by coup/putsch are several. Meanwhile, arrivals in office by coup/putsch represent political instability. This database indicates from Table A2 that of the 239 African presidents evaluated, around 35% accessed power through a coup/putsch. It is expected that militarily educated presidents are the ones who use coups/putsch the most to ascend to power. Table A2 shows that 60 of 84 of African presidents who accessed power by coup/putsch were militarily educated. This implies that 24 African presidents who accessed power by coup did not have a military formation but could have used military resources to ascend to power. This is the case of Emile Derlin Zinsou of Benin Republic, a medical doctor by profession who accessed power through a coup/putsch. When looking at how the highest degree obtained by African presidents can affect the way by which they choose to access power, Table A2 indicates that 60 presidents having a High School diploma or less as their highest degree, obtained power through a coup/putsch. 52 of the 60 presidents, who accessed power through a coup/putsch, had both high school diplomas as their highest degree obtained as well as a military formation. Table A2 illustrates that of the 84 African presidents who arrived to power through a coup/putsch, 24 of them held at least a college degree as their highest degree obtained. Table A2 indicates that 14 Presidents who accessed power by coup had a

college/bachelor degree as their highest degree obtained while 10 Presidents who accessed power by coup had master's/Ph.D. degrees. This trends show that the highest diploma obtained by African presidents does have an influence on the manner in which they access power. Presidents with higher educational credentials are less likely to access power through a coup/putsch. Table A3 indicates that leaders prior to 1990 seemed to use coups/putsch more frequently to access power than leaders post-1990. As such, prior to 1990, 40% of leaders accessed power through a coup/putsch while post-1990 only 28% of leaders accessed power through a coup/putsch.

When analyzing the trend of African presidents arriving in power by coup from 1960 to 2011, Figure A5 shows again two types of curves: an ascending curve going from 1960 to 1990 and a descending curve from 1990 to 2011. This indicates that until the early 1990s, coups were a common method used by African presidents to access power. Figure A5 shows that an average of 48% of African presidents in power in 1990 accessed power through a coup/putsch. This curve is very similar in its trajectory to the curve of the evolution of length of stay of African presidents.

4.2.3 Highest Degree Obtained by African Presidents

The main independent variable of analysis in this study is the highest degree obtained by African presidents. Like stated previously, of the 239 presidents accounted for post-independence, around 45% obtained a high school diploma as their highest degree earned while around 25% obtained a college/bachelor degree and around 30% earned a master's/Ph.D. as their highest degree. The highest degree obtained by African presidents is shown to have an effect on the method of arrival of African presidents in power as well as their length of stay in power.

Of the 45% of African presidents evaluated as having earned a high school degree, 76% obtained military training as well. This implies that following their high school diploma many presidents opted to join the military. Of the 239 presidents included in this study, 97 presidents obtained military training. It is observed that many presidents with military training or a degree have opted to join the military at most after finishing high school as 84% of military leaders have a high school diploma as their highest civil degree obtained. Some presidents decide to join the army following some higher studies. For instance, 15% of African presidents have opted to join the army following a college/bachelor degree. Only William Tubman, the first president of Liberia, managed to complete law studies as well as being a colonel in the militia.

From Table A3 it is observed that prior to 1990 African leaders in office were less educated than post-1990. As such, pre-1990, 72 of 135 leaders, or around 53% of leaders, were identified as having a high school diploma or less as their highest earned degree. Meanwhile, post-1990, Table A3 identifies only 34% of African leaders as having a high school degree or less as their highest earned diploma. This finding shows that post-1990, mainly educated leaders have governed the African continent.

Figure A3 presents the evolution of the Mean Highest Degree Obtained by African Presidents while Figure A4 presents the evolution of presidents having a military formation from 1960 to 2011. Figure A3 shows that presidents having a high school diploma have seen the most variation in time. In the early 1970s, the rise of authoritarian regimes as well as the rise of the unique party has seen Africa have many presidents with a high school diploma as their highest earned degree. Many of them were militarily educated, and Figure A4 presents a similar curve to the high school curve in Graphic A3. Following the end of the

Cold War in 1990 and the introduction of multiparty elections on the continent, Africa's percentage of leaders with a high school diploma as their highest earned degree has dropped considerably. On the other hand, it is observed that presidents with master's/Ph.D. degrees as well as college/bachelor degrees have increased since the 1990s. As a result, in 2011 around 60% of African leaders had at least a college degree as their highest earned diploma.

4.2.4 Age of African Presidents at Arrival in Power

When looking at the mean age of African presidents when arriving to power, Table A1 indicates that on average, African presidents tend to arrive to power aged 51. Like for the average length of stay in office, certain individual characteristics of African presidents will influence their age at arrival in office. Hence, the highest diploma obtained as well as the method of arrival to power can have an incidence on the mean age of African presidents when arriving in power. It is expected that presidents having obtained a lower level of formal civil education as well as presidents having a military formation should arrive in power on average at a younger age than more highly educated presidents. Presidents arriving in power by coup are also expected to arrive younger on average. For instance, African presidents having a high school diploma or less tend to arrive on average aged 47, compared to 52 years of age if they hold a college/bachelor degree and 55 years of age at arrival in power if they hold a master's/PH.D degree. However, Table A1 indicates that the standard deviation is more volatile for leaders with higher degrees. For militarily educated presidents, Table A1 indicates that they also tend to arrive to power younger than the average, aged 46, while presidents arriving by coup tend to arrive in power aged 45.

When looking at how the highest degree earned by African presidents affects their age at arrival to power, Table A2 suggests that the highest degree earned by African presidents seems to have an impact on their age of arrival to power, as presidents arriving younger seem to have high school or military formations as their highest earned degree. As such, it is observed that of the 78 presidents arriving to power before age 45, 60.26% seem to have a military formation. On the other hand, 17 of the 32 African presidents arriving to power at 65 or older hold a master's/Ph.D. degree. Table A3 identifies that prior to 1990, African leaders arrived in power younger, as only around 16% of leaders accessed power past 60 years of age and 65% of presidents prior to 1990 arrived to power under age 45. Meanwhile, post-1990, Table A3 identifies 32% of leaders arriving to power past 60 years of age. Table A3 also shows that post-1990, only around 15% of leaders accessed power under the age of 45. This finding again shows the change in profile of the African leaders pre and post-1990.

From Figure A2, one can observe that the evolution of age at arrival to power post-independence in Africa has increased since the 1960s. As such, like other trends presented in this section, presidents arrived to power younger from 1960 to 1990, with many militarily educated presidents in power, and starting from the 1990s, presidents' age at arrival in power increased.

From the descriptive statistics above, the highest degree obtained by African presidents is seen as being a determinant factor in their method of arrival to power as well as their length of stay in power. The highest earned degree is also shown to have an impact on several other individual characteristics of African presidents. On the other hand, there also exist several other factors that can interact with a president's length of stay in power. It

is therefore important when analyzing the impact of the highest degree earned on African presidents' length of stay to control for country and year specific fixed effects.

4.3 Kaplan-Maier Survival Curves and Nelson-Aalen Hazard Curves

The summary statistics and evolutions of individual characteristics of African leaders presented above offer the average length of stay of African leaders as well as the evolution of length of stay of African leaders from 1960 to 2011. Another approach to analyzing the length of stay in power of African presidents is by observing Kaplan-Maier survival curves. These curves offer the probability of African presidents remaining in power after a certain length of time. Figures A6 to A8 offer three Kaplan-Maier survival curves in order to determine how certain individual characteristics of African leaders, such as arrivals to power by coup/putsch or highest degree obtained, affect the probability of African leaders remaining in power after a certain length of time.

Before analyzing how individual characteristics of African presidents affect their probability of surviving in power, Figure A6 proposes a Kaplan-Maier unconditional survival curve. It is observed that over time the probability of African leaders surviving an extra year in power decreases. For instance, Figure A6 illustrates there is a 75% probability that African leaders will survive following four years in office and a 50% probability that African leaders will survive following ten years in office. After ten years in office, the survival curve of African presidents decreases more rapidly, with only around 20% of African leaders expected to survive following 20 years in office while only around 10% of African leaders are expected to survive following 30 years in office.

Figure A7 compares the probability of educated² African leaders surviving an additional year in power with that of non-college educated African presidents. Figure A7 shows that over time, educated African leaders have less chances of surviving an additional year in office when compared to non-college educated presidents. For instance, it is observed that following their tenth year in office, educated African leaders have a 33% chance of surviving an additional year in power compared to a 52% chance for non-college educated leaders. After 20 years in office, the chance of educated leaders surviving an additional year in office drops to around 20%, compared to around 25% for non-college educated leaders. Figure A7 illustrates the fact that in the case of Africa, educated leaders have less chance of surviving an additional year in power when compared to non-college educated leaders. Meanwhile, it will have to be seen if this result is strong enough to show up as significant in the regression analysis.

Figure A8 presents a Kaplan-Maier survival curve of African leaders arriving in power through a coup/putsch versus African leaders arriving through any other means. Figure A8 observes that when compared to presidents arriving in power through other means, the survival chances of African leaders arriving in power by coup are lower for the first ten years. Meanwhile, after the first ten years, survival chances in power of African leaders arriving through a coup increase and become greater when compared to leaders who did not access power through a coup. This could be explained by the fact that when a leader arrives to power by coup, the state is very fragile at first, which could lead to another coup or a political transition. Meanwhile, if a leader arriving by coup can survive the first ten years, he has time to establish a strong central authority and it can become difficult to

² For the purpose of this study, educated African leaders are African leaders having at least a college degree as their highest earned diploma.

overthrow him. For instance, from the descriptive statistics above, the three longest serving African presidents are all military leaders that arrived to power by coup. This implies that the means through which a president arrives to power does influence his length of stay in office, with presidents choosing to arrive by coup less likely to survive longer in power for the first ten years.

Like for the Kaplan-Maier survival curves, Figures A9 to A11 provide three Nelson-Aalen cumulative hazard curves. Due to the fact that cumulative hazards do not take into account the effect of the covariates, the interpretation of such curves is not of great importance, but plotting them allows one to obtain the cumulative hazard function for two different groups of individuals. For the sake of this paper, Figure A9 will provide a general Nelson-Aalen hazard curve while Figure A10 compares the cumulative hazard curve between educated African leaders and non-College educated African leaders. Figure A11 compares the cumulative hazard curve between African leaders arriving to power by coup and those accessing power through any other mean.

From Figure A9 it is observed that the cumulative hazard for African leaders' survival in power is increasing slightly until year ten in power. Following the tenth year in office, the cumulative hazard function is constant until year 30 in office, from where it starts increasing exponentially. Figure A9 shows that the cumulative risk associated with remaining in power is approximately constant for the first 30 years of power, after which the risk increases greatly. When comparing the cumulative risk associated with remaining in power for educated and non-college educated African leaders, Figure A10 shows that for the first ten years of office, the cumulative risk of leaving office is greater for educated leaders. This is consistent with the findings of Kaplan-Maier curves, which show that

educated leaders are less likely to survive ten years in office when compared to non-educated presidents. Meanwhile, the cumulative hazard in Figure A10 shows that following the first ten years in office, the cumulative hazard decreases for educated presidents, indicating that they have higher chances of surviving in power when compared to non-college educated presidents. Figure A10 shows that for both groups, after 30 years in office the cumulative risk to remain in power increases exponentially. Figure A11 analyses the Nelson-Aalen cumulative risks associated with African leaders arriving by coup versus African leaders accessing power through any other means. It is observed from Figure A11 that consistent with the survival curve discussed above, the cumulative risk of leaving power for presidents arriving through a coup/putsch is lower after ten years in office. Meanwhile, after 30 years in office, the cumulative risk for presidents leaving office increases exponentially in both groups of leaders.

5. Major Empirical Results

The following section presents the major empirical findings of this paper. All the tables discussed below can be found in Appendix B. Section 5.1 analyses the effects of education of African leaders on their survival time in power while Section 5.2 looks at how the introduction of democracy and multiparty elections following 1990 have affected the survival time in power of educated leaders. Section 5.3 verifies for robustness of results found in Section 5.2 by using interaction variables between the highest earned degree of African leaders and their year of arrival in office.

5.1 Impact of Education on African Leaders' Survival Time in Power

When looking at how the highest earned degree of African leaders affects their chances of survival in power, it is observed from Table B1 that the highest earned degree of African leaders has no impact on their chances of survival in power. Specifications (1) to (4) all show that educated and non-college educated presidents have around the same chances of survival in power. This result does come as a surprise, as it should be expected that non-college educated presidents should survive longer in power due to the fact they have fewer options available outside power, making them want to hold onto their positions as long as possible. Meanwhile, the political situation on the African continent has allowed leaders to be very influential in their states as they inherited weak institutions at independence. Weber (1947) highlights the importance of leaders when the national bureaucracy and the traditional social norms are weak. Gazibo's portrait of the African political sphere from 1960 to today recognizes the influential role of leaders in shaping the African political context by using tools such as the unique party and the use of force. From Acemoglu et al. (2010), weak institutions as well as high incomes encourage leaders to exert their incumbent veto power, which has led to the persistence of 'bad' governments. This result demonstrates that as the heads of weak institutions, both educated and non-college educated leaders will shape the political sphere to gravitate around them and try to hold onto power as much as they can.

Specification (1) identifies the raw effect of education on African leaders' chances of survival in power and shows that the highest earned degree of African leaders has no influence on their chances of survival in power. Specification (3) even shows that the

chances of survival in power of African educated leaders are identical to those of non-college educated leaders, while not being significant.

When controlling for various individual characteristics of African presidents, specification (2) shows that as the time spent in power of African leaders increases, their chances of survival in power increases. This can be explained by the fact that the longer leaders remain in power, the more ability they have to shape the political sphere around them. Specification (3) identifies individual characteristics of African leaders as having no incidence on their chances of survival in power. As such, leaders' religious beliefs, ages, or methods of arrival in power have no effect on their chances of survival in power. Specification (4) meanwhile shows that regions matter, as when compared to West African leaders, leaders in East Africa, Central Africa and Southern Africa are expected to have higher chances to remain in power, while being significant at 10%.

Table B2 presents the marginal fixed effects of specification (4) and confirms the findings of Table B1 that when compared to non-college educated presidents, the probability for educated leaders to depart from office is 1.6% less than that of non-college educated leaders, all other factors remaining constant. Meanwhile, this result is not statistically significant. Table B2 also shows that for leaders arriving by coup the probability to depart from office is around 10% less than that of leaders arriving through other means, all other factors remaining constant. Like above, this result is not statistically significant. This implies that individual characteristics of African presidents as identified above have no incidence on African leaders' survival time in power. Concerning regional effects, Table B2 shows that when compared to West African leaders, only Central African leaders are expected to survive longer in office. As such, the probability of Central African leaders

departing from office is around 27% less than that of West African leaders, all other factors remaining constant, while being significant at 10%. These results show that overall, individual characteristics of African leaders do not affect their chances of survival in power.

5.2 Impact of Democracy on African Leaders' Survival Time in Power

To understand the impact the introduction of multiparty elections has had on the survival in power of African leaders, this paper chose to separate leaders from 1960 to 1989 from those from 1990 to 2011. As identified in the descriptive statistics above, prior to 1990 the continent was dominated by non-college educated leaders who ruled for around 53% of the time, while post-1990 non-college educated leaders ruled for only 37% of the time. This implies that following the introduction of multiparty elections, college educated leaders dominated the African political sphere.

Table B3 identifies the chances of survival in power of college educated leaders prior to 1990, and finds that education does not impact chances of survival in power of African leaders. Specifications (1) to (4) all show that leaders' educational attainments have no impact on their chances of survival in power. Following 1960, many African leaders inherited countries with very weak national bureaucracies. As such, leaders arriving to power had more room to shape institutions to remain in power.

Specification (4) shows that presidents arriving through other means than a coup/putsch have around nine times the odds to depart from power relative to presidents who arrive by coup, while being significant at 10%. This finding shows that leaders arriving to power by the use of force increased their chances of survival in power prior to 1990. The use of force could have been used to weaken oppositions as well as institutions and hence explain how leaders arriving by coup/putsch survived longer in power. Gazibo finds that

prior to 1990, African regimes had three common characteristics: First the lack of legitimate leaders; second, the presence of authoritarian regimes; and last, the presence of military in African politics. This finding is consistent with the above as coups were generally realized by military leaders who needed to exert force in order to gain legitimacy. Tools such as the unique party served this purpose. Specification (4) highlights the importance of regional effects as leaders from West Africa had around 10 times the odds to depart power relative to Central African leaders, and around 14 times the odds to depart power relative to Southern African leaders, while both being significant at 10%.

Table B4 confirms the above results by presenting the marginal fixed effects of Specification (4). Table B4 shows that leaders arriving by coup/putsch have a probability to depart from power that is 20% less than that of leaders arriving through other means, all other factors remaining constant, as well as being significant at 10%. These findings demonstrate that prior to 1990, the highest earned degree of African leaders had no impact on affecting their survival in power. Meanwhile, leaders who wanted to maintain themselves in power had to use force in order to do so, hence illustrating the lack of legitimacy of certain leaders.

Following 1990 and the introduction of multiparty elections, the political selection on the African continent changed with now more than 60% of leaders having received at least a college degree. Meanwhile, Table B5 indicates that educated leaders have around three times the odds to depart from power when compared to non-college educated presidents, while being significant at 10%. Specifications (1) to (4) all indicate that the odds of educated leaders to depart from power are higher than those of non-college educated leaders, with specification (4) even being significant at 1%. This result comes as a surprise,

as it should be expected that post-democratization of the continent educated leaders should have more chances to survive in power. Meanwhile, results follow the conclusions of Acemoglu et al. (2010) that 'bad' leaders can use their incumbent veto powers to remain in office. As such, non-college educated leaders may persist in power. This result validates the fact that non-college educated leaders will try to hold onto power as much as possible due to the fact that they have fewer options available outside office. The fact that from 1990 educated leaders have governed the African continent more than 60% of the time confirms the findings of Besley and Reynal-Querol (2011) that democracies select better leaders than non-democracies. Meanwhile, there is a persistence of 'bad' leaders who force their survival in power.

Specification (2) of Table B5 also highlights the change in the baseline hazard when compared to Table B3. Prior to democratization, African leaders faced more chances to depart from office the less time they spent in office, while post democratization the baseline hazard shows that leaders now face more chances to survive in power the less time they remain in office. This finding implies that multiparty elections have brought more political stability to the African continent as leaders now increase their risk of departure the longer they remain in power. Specification (3) highlights the impact of individual characteristics of African leaders on their survival in power and shows that unlike in Table B3, leaders arriving by coup do not increase their chances of survival in power. This confirms that the risk associated with being in power decreased post-democratization, as the use of coups/putsch to access power seems less determinant. From Specification (4) it is observed that regions do affect survival time in power of African leaders, as post-1990 leaders from

West Africa had 10 times the odds to depart from power relative to Central African leaders, while being significant at 5%.

Table B6 presents the marginal fixed effects of the probability of African leaders to depart from power post-1990 and confirms the findings in Table B5. Table B6 shows that the probability of educated leaders departing from office is of 26% more than that of non-college educated leaders, all other factors remaining constant, while being significant at 1%. From the baseline hazard it can be seen that post democratization, the probability to depart from power decreases the longer a leader spends in office. These findings show a change in the political selection in the African continent with more educated leaders being present in power post-1990. Meanwhile, results show a persistence of non-college educated leaders in power.

By testing for the effect of individual characteristics of African leaders pre and post-1990, it is observed that African leaders' survival chances in power have changed over the years. The fact that coups/putsch pre-1990 increased chances of survival in power of African leaders shows the political instability that reigned on the African continent prior to 1990 and shows that for a leader to increase his chances to remain in power, the use of force was generally required to affirm his legitimacy. Post-1990 results show a more politically stable continent with coups/putsch not affecting a leader's survival chances in power. Meanwhile, post-1990 non-college educated leaders are identified as having more chances of survival in power, indicating the persistence of non-college educated leaders in power. As observed by Adejumobi (2000), the introduction of democracy and multiparty elections on the African continent has not always been successful. This paper illustrates this by demonstrating a persistence of non-college educated leaders in power post-1990. The

findings of Table B3 and B5 also can explain why overall, individual characteristics of African leaders have no impact on their chances of survival in power as the change in profile of leaders cancels the impact of their individual characteristics on their chances of survival in power. For instance, prior to 1990 coups/putsch-increased chances of survival in power, while post-1990, coups/putsch were not as frequent on the continent. This can allow for the effect to cancel itself.

Education, by promoting civic behavior should increase educated leaders' chances of survival in power following the introduction of multiparty elections. Meanwhile, this paper finds that it is the chances of survival of non-college educated leaders that increase post-1990. This finding goes against the theory defined earlier but confirms the findings of Besley and Reynal-Querol (2011) that indicate that democracies select more educated leaders than non-democracies. This finding is also in agreement with Acemoglu et al. (2010) that highlight that in the presence of high incomes and weak institutions, 'bad' leaders will exert their incumbent veto power in order to remain in office.

5.3 Verifying Robustness of Results

In order to verify the robustness of the findings highlighted in sections 5.1 and 5.2, this section uses interaction variables between the highest earned degree of African leaders and their year of ascension to power. Findings from specification (4) of Table B7 show that leaders arriving in power from 1960 to 1989 had around 25 times the odds to depart from power, when compared to leaders arriving post-1990, while being significant at 1%. This result confirms the findings in Section 5.1 that the political situation on the African continent was more unstable prior to the introduction of multiparty elections. Concerning

the effects of the highest earned degree of African leaders on their survival in power, it is confirmed that post democratization, educated African leaders have three times the odds to depart from office relative to non-college educated leaders, while being significant at 10%. This result confirms the above findings that post-democratization, non-college educated leaders have persisted in power when compared to educated leaders. Table B7 also shows that leaders arriving to power by other means than a coup/putsch have around three times the odds to depart from power when compared to presidents arriving through a coup/putsch, confirming the results found previously that leaders arriving through a coup are more likely to use force to maintain themselves in office.

Table B8 shows the marginal fixed effects of specification (4) of Table B7 and confirms the results described above. It is therefore observed that post-1990 the probability of educated leaders departing from was 12% more relative to that of non-college educated leaders, all other factors remaining constant, while being significant at 10%. Prior to 1990, it is observed that the probability of leaders departing from was 51% more than that of leaders arriving in power post-1990. Once again, this highlights the political instability that reigned on the African continent between 1960 and 1990. Unlike the above findings, Table B8 shows that coups, as well as education of leaders prior to 1990, do not affect their survival in power.

These results confirm the findings of sections 5.1 and section 5.2 and show that prior to 1990, the African political landscape was a lot more unstable than present. Meanwhile, it can be observed that education does play a role on survival in power of African leaders, particularly post-1990, where non-College educated leaders are found to survive longer in power than educated leaders. As such, the African context confirms the findings of Besley &

Reynal-Querol (2011) due to the fact that the introduction of multiparty elections has brought to power more highly educated leaders. Meanwhile, the findings of this paper also confirm the findings of Acemoglu et al. (2010) that in all other political systems than democracies, high incomes as well as weak institutions will encourage 'bad' leaders to exert their incumbent veto vote to remain in power. The African case makes no exception and indicates the persistence of non-college educated leaders in office post-1990. This section confirms that findings in sections 5.1 and 5.2 are robust.

6. Concluding Remarks

This paper attempts to explain how individual characteristics of African leaders, particularly their highest earned diploma, can affect their survival in power. This study focuses on the African example due to the fact that the African continent has known two distinct periods over the last fifty years: one, pre-1990, in which Gazibo (2006) describes leaders to lack legitimacy as well as having authoritarian tendencies, and one post-1990, in which multiparty elections were introduced on the African continent. This study observes the overall effect of individual characteristics of African leaders on their survival time in power before analyzing how the introduction of multiparty elections has affected political selection on the African continent.

Through a series of descriptive statistics, this paper observes how individual characteristics of leaders have evolved on the African continent in a little more than fifty years. Findings show that in 2011 around 60% of African leaders had at least a college degree as their highest earned diploma. Using a logit discrete duration time model, this study observes how individual characteristics of leaders affect their chances of survival in

power. Results show that overall, the highest earned degree of African leaders has no impact on their chances of survival in power. This result does come as a surprise as it implies that college and non-college educated leaders have the same chances of survival in power. In the African context, weak institutions inherited at independence have allowed leaders more freedom to structure power around themselves. Meanwhile, results pre-1990 show the importance of coups/putsch as leaders arriving by coup/putsch increased their chances of survival in power. This finding highlights the political instability that reigned on the continent prior to 1990 and shows that leaders using force increased their chances of survival in power. Following the introduction of multiparty elections post-1990, this paper notices the change in composition of leaders with more college educated leaders in power. This implies that post-1990 Africa has had more educated leaders than in the previous 30 years, but results show that there has been a persistence of non-college educated leaders that remain in office and hold onto their power. This result highlights the findings of Acemoglu et al (2010) that there is not a shortage of quality leaders, but that 'bad' leaders will use their incumbent veto power in order to remain in office.

The findings of this study show a persistence of less educated leaders in power, particularly post-1990. Meanwhile, further research would be necessary to determine the impact of political leaders on economic results. As such, the methods used by Jones & Olken (2005) as well as those of Besley et al. (2009) could be used to determine if more educated African leaders perform better than non-college educated leaders. Recent research conducted by François, Rainer and Trebbi (2012) looks at how political power is shared between cabinet ministers in Africa since independence and shows that political power is allocated proportionally to population shares across ethnic groups. An extension of this

research could attempt to analyze the impact of ethnicity of African leaders on their survival time in power. In an attempt to understand how leaders come to hold power, this study shows that individual leader characteristics do affect their chances of survival in power. Meanwhile, the effects of individual characteristics of leaders on their survival time in power depends on the period in which they took power, as leaders arriving prior to 1990 do not exhibit the same characteristics as leaders post-1990.

Works Cited

- Acemoglu, Daron, Gregory Egorov, et Konstantin Sonin. «Political Selection and the Persistence of Bad Governments.» *Quarterly Journal of Economics* 125, n° 4 (2010): 1511-1576.
- Adejumobi, S. «Elections in Africa: A Fading Shadow of Democracy.» *International Political Science Review* 21, n° 1 (2000): 59-73.
- Ake, Claude. «Rethinking African Democracy.» *Journal of Democracy* 2, n° 1 (1991): 32-44.
- Ake, Claude. *Democracy & Development in Africa*. Édité par Brookings Institution Press. 1995.
- Akindes, Francis. «Les mirages de la démocratisation en Afrique subsaharienne francophone.» (Codesria/Karthala) 1996.
- Beckman, Björjn. «Whose Democracy? Bourgeois vs. Popular Democracy.» *Review of African Political Economy* 16, n° 45/46 (1989).
- Besley, Timothy. «Political Selection.» *Journal of Economic Perspectives* 19 (2005): 43-60.
- Besley, Timothy, and Marta Reynal-Querol. «Do Democracies Select More Educated Leaders.» *American Political Science Review* 105 (2011): 552-566.
- Besley, Timothy, and Stephen Coate. «An Economic Model of Representative Democracy.» *Quarterly Journal of Economics* 112, n° 1 (1997): 85-114.
- Besley, Timothy, Jose Montalvo, and Marta Reynal-Querol. «Do Leaders Matter.» *The Economic Journal*, 2011.
- Bertrand, Marianne, and Antoinette Schoar. «Managing with Style: The Effect of Managers on Firm Policies.» *Quarterly Journal of Economics* CXVIII (2003): 1169-1208.
- Bratton, Michael, and Nicolas Van de Walle. *Democratic Experiments in Africa: Regime Transitions in Comparative Perspective*. Cambridge: Cambridge University Press, 1997.
- Card, D. «The Causal Effect of Education on Earnings.» *Handbook of Labor Economics* (O.Ashenfelter & D. Card) 3 (1997): 1802-63.
- Carlyle, Thomas. *On Heroes, Hero Worship and the Heroic in History*. New York: Wiley & Halsted, 1859.

Caselli, Francesco, and Massimo Morelli. «Bad Politicians.» *Journal of Public Economics* 88, n° 3-4 (2004): 759-82.

Chazan, Naomi, Peter Lewis, Robert Mortimer, Donald Rothchild, and Stephen Stedman. *State Institutions and the Organization of the Public Arena*. 1999.

Chazan, Naomi. *Regimes in Independent Africa*. Boulder: Lynne Rienner Publishers, 1999.

Decalo, Samuel. *The Stable Minority: Civilian Rule in Africa, 1960-1990*. Gainesville: FAP Books, 1998.

Dee, T.S. «Are There Civic Returns to Education?» *Journal of Public Economics* 88, n° 9-10 (2004): 1697-1720.

Diamond, L. «Beyond Autocracy: Prospects for Democracy in Africa» In *Beyond Autocracy in Africa*, de Diamond L. Atlanta: The Carter Center, Emory Center, 1989

Francois, Patrick, Ilia Rainer, and Francesco Trebbi. «How is Power Shared in Africa.» *Working Paper*, September 2012: 1-56.

Gazibo, Mamadou. *Introduction à la Politique Africaine*. Montreal: Les Presses de l'Université de Montreal, 2006.

Ibrahim, J. «Democratic Transitions in Africa: The Challenge of a New Agenda.» In *Democratization Processes in Africa: Problems and Prospects*, by E. Chole and J. Ibrahim. Dakar: CODESRIA, 1995.

Ihonvbere, J. «The Crisis of Democratic Consolidation in Zambia.» *Civilizations* XLIII (1996).

Johnson, W. Bruce, Robert Magee, Nandu Nagarajan, and Harry Newman. «An Analysis of the Stock Price Reaction to Sudden Executive Deaths.» *Journal of Accounting and Economics* VII (1985): 151-174.

Jones, Benjamin F., and Benjamin A. Olken. «Do Leaders Matter? National Leadership and Growth since WWII.» *Quarterly Journal of Economics*, 2005.

Lagoye, Jacques. «La Légitimation.» Dans *Traité de science politique*, de Madeleine Grawitz et Jean Leca, 397. Paris: PUF, 1985.

Nzongola, Ntalaga G., and M Lee. «Introduction.» In *The State and Democracy in Africa*, by Ntalaga G. Nzongola and M Lee. Harare: AAPS, 1997.

Marx, Karl. *Eighteenth Brumaire of Louis Napoléon*. 1852.

Milligan, K, E Moretti, and P Oreopoulos. «Does Education Improve Citizenship? Evidence from the US and the UK.» *Journal of Public Economics* 88, n° 9-10 (2004): 1667-95.

- Osborne, Martin J., and Al Slivinski. «A Model of Political Competition with Citizen Candidates.» *Quarterly Journal of Economics* 111, n° 1 (1997): 65-96.
- Poirier, Dale, and Paul Ruud. «Probit with Dependent Observations.» *Review of Economic Studies* 55 (1988): 593-614.
- Rohan, M. Josselin de. «La Politique Africaine de la France.» Ordinaire, Sénat, 2011.
- Weber, Max. *The Theory of Social and Economic Organization*. New York: Free Press, 1947.
- Weiss, Herbert. «Introduction.» In *Rébellions-révolutions au Zaïre, 1963)1865*, de Catherine Coquery-Vidrovitch, Alain Forest et Herbert Weiss, 14. Paris: L'Harmattan, 1987.
- Young, Crawford. «The Third Wave of democratization in Africa: Ambiguities and Contradictions.» In *State, Conflict and Democracy in Africa*, de Richard Joseph, 23. Boulder/London: Lynne Rienner, 1999.
- Van de Walle, Nicolas. «Africa's Range of Regimes.» *Journal of Democracy* 13, n° 2 (2002): 66-80.

APPENDIX