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More elections, more burden? On the relationship between elections and public debt in Africa

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Abstract

The political determinants of public indebtedness in developing countries is still generating a lot of interest among academics and policy makers. This paper investigates whether elections influence the public debt dynamics relying on data from 51 African countries spanning 1990 to 2015. The analyses are conducted using the fixed effects and the system Generalized Method of Moments (GMM). The results reveal that although all types of elections increase public debt, only the impact of the presidential elections are significant. The findings are robust irrespective of the estimation technique. The paper recommends African countries to rationalize public resources, particularly in the election years.

Keywords: Public debt; Elections; Africa; Fixed effects; System GMM.

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1. Introduction

Debt across the world has increased significantly over the past two decades given the increasing need for funding in most economies, especially in developing and transition economies (Calderón and Zeufack, 2020; Atta-Mensah and Ibrahim, 2020; Kose *et al*., 2020; ECA, 2019; Fatás *et al*., 2019 and AfDB, 2018). Largely for this reason, debt issue in Africa is still at the heart of debates in the past few decades. For most part, the rising debt is considered as one of the continent's main economic challenges (Bayale, 2020a; Calderón and Zeufack, 2020; IMF, 2019; World Bank, 2019). However, factors underlying the increase in African countries' public debt are inexhaustible. What are the factors that explain public debt? Do governments borrow before or during elections years? In fact, the economic literature identifies several factors that can influence public debt. Among other things, we can mention macroeconomic imbalances, country size and the level of development, crises and external shocks, openness and exchange rate regime (Fatás *et al*., 2019; Forslund *et al*., 2011). Macroeconomic imbalances category includes some variables such as GDP growth (Chiminya and Nicolaidou, 2015), inflation (Gomez-Gonzalez, 2019; Forslund *et al*., 2011), current account balance (Fatás *et al*., 2019; Forslund et al., 2011), interest rates (Atta-Mensah and Ibrahim, 2020), and employment (Sadik-Zada and Gatto, 2019). The country size and level of development is related to indicators such as GDP per capita (Sadik-Zada and Gatto, 2019), broad money to GDP (Forslund *et al*., 2011) and population (Bohn and Veiga, 2019). Regarding crises and external shocks, that category capture the crisis situations related to a sovereign default and other impulsive changes in the current macroeconomic situation. Finally, the last category sketches trade and capital account openness and the fixed or loathing exchange rates.

Several studies have shown that these economic factors may drive public debt. For instance, while providing the trajectory of Africa's, Atta-Mensah and Ibrahim (2020) found that the interest rate-growth differential is the main drivers of overall debt dynamics in African economies. By focusing on the motives to borrow, Fatás *et al*. (2019) establish that intertemporal tax-smoothing, fiscal stimulus and asset management can explain some of the increases in public debt in recent years. Zada and Gatto (2019) investigate into the major drivers of the public debt growth in 184 countries. Their findings have shown that oil abundance, economic growth rate, the share of mineral rent in the total revenue, interest rate payments for foreign borrowings, and being a developing country have statistically significant impact on the growth of the public debt, whereas

defense spending, unemployment rate, and inflation rate do not have a statistically significant positive impact on the public debt rate. According to Chiminya and Nicolaidou (2015) who investigate into the determinants of external debt in sub-saharan Africa, countries that received debt relief seem to accumulate less debt in comparison to those that did not receive debt relief. Their findings also highlighted the importance of economic activity in reducing debt in the region. Economies that are more opened to international trade reduce their debt burden. Forslund *et al*., (2011) analyzed the determinants of the composition of public debt in developing and emerging market countries. Authors have found a weak correlation between inflation and the composition of public debt.

Beyond studies mentioned above, Bayale (2020a), Fatás *et al*. (2019), Bohn and Veiga (2019), Potrafke (2018) and Alesina and Passalacqua (2016) suggest that even if economic factors can explain some of the increases in public debt in recent decades, they cannot account for all of the observed changes. The electoral cycles may also generate different incentives to borrow. They can be a major cause of overborrowing though budgetary institutions and fiscal rules can play a role in mitigating governments' tendencies to over borrow (Fatás *et al*. 2019). However, a very limited literature has attempted to investigate the effect of some socio-political variables on debt (Bayale, 2020a; Sadik-Zada and Gatto, 2019; Kaplan and Thomsson, 2017). Indeed, the Africa's democracy is nascent and a key element in a democratic regime is the need for free and fair elections. In this endeavour, several countries over the past few decades have conducted elections to select political leaders. At the same time, issues around Africa's continent debt continue to grow. However, studies examining whether or not elections contribute to the debt dynamics in Africa is dearth. The failure of existing studies to re-engage elections-debts dynamics leaves policy makers under quandary regarding whether election cycles contribute to debt. Given this gap, re-examining the debt dynamics given the continent's electioneering process needs far more nuanced and in-depth analysis.

In this paper, we examine the effect of all types of elections on public debt. Specifically, our aim is to investigate whether elections can explain some of the increases observed in African's public debt. Africa presents a fine test case because of its democratic experiment. Indeed, right after independence, most African countries had dictators governing them and practiced a one-party state system (Agoba *et al*., 2020; Agbloyor, 2019). However, in recent times, especially starting from the 1980s and the early 1990s, most African countries have made strenuous efforts to improve their democratic credentials (UNDP,

2016). It is within this context that we examine how elections influence public debt in Africa.

Our analyses suggest a positive relationship between elections and public debt. Among the three types of elections, only the presidential elections have a significant effect on public debt accumulation in Africa. The remainder of this paper is organized as follows. Section 2 presents an overview on elections events, political regimes and debt in African countries since 1990s. In section 3, we present the empirical methods adopted in this paper. We present results from our empirical analysis in section 4. Finally, we conclude the paper in section 5 with key policy implications.

2. Elections, political regimes and debt in Africa: An overview

2.1. Elections and political regimes in African countries

Since the early 1990s, majority of African countries have undergone momentous transitions from one-party, military or autocratic rule to multiparty democratic systems based on majority rule and popular participation (UNDP, 2016). These democratic transitions favored the holding of periodic elections, the foundation of most democratic arrangements (Agboyor, 2019). Basing on the National Elections across Democracy and Autocracy (NELDA) dataset which provides detailed information on all election events, this study employs elections events including three types of elections: presidential, parliamentary and constituent assembly elections.

Tables 1 and 2 exhibit the number of elections and the years of elections in 51 African countries spanning the period from 1990 to 2015. Data is showing that election events between this period amount to 549 including 244 presidential elections, 299 parliamentary elections and 6 constituent assembly elections events. In terms of yearly trends in election events, years where which we observe lower number of elections are 1991, 2003 and 2008 with 12, 10 and 13 elections events, respectively, whereas 1992, 1993, 1996 and 2011 present higher number of elections with 31, 31, 32 and 37 cumulative elections events, respectively (Table 1). In addition, we can observe that most countries in Africa run presidential elections concurrently with parliamentary elections and/or constituent assembly elections. However, not all countries in Africa undertake presidential elections as some countries practice monarchy system of presidential elections. If we consider the total number of 549 elections events that occurred during the period understudy, 376 elections representing 68.49% constituted elections where both presidential and parliament elections

were run concurrently while 173 elections events representing 31.51% did not include presidential and parliament elections events, simultaneously. According to NELDA, some countries like Botswana, Ethiopia, Lesotho, Libya, Morocco and South Africa did not undertake presidential or executive elections. They held only parliamentary elections. No election events were mentioned by NELDA in Eritrea, Somalia and South Sudan in our study period (see Table 2).

Table 1: Summary of Yearly Election Types in Africa (1990-2015)

Years	Presidential	Legislative	Const. Assembly	Total
1990	5	11	0	16
1991	6	6	0	12
1992	12	18	1	31
1993	14	17	0	31
1994	6	10	3	19
1995	3	12	0	15
1996	21	11	0	32
1997	5	14	0	19
1998	5	9	0	14
1999	12	12	0	24
2000	8	11	0	19
2001	11	9	0	20
2002	8	18	0	26
2003	5	5	0	10
2004	9	12	0	21
2005	12	9	0	21
2006	13	8	0	21
2007	8	19	0	27
2008	5	8	0	13
2009	11	9	0	20
2010	11	8	0	19
2011	19	17	1	37
2012	7	11	0	18
2013	6	13	0	19
2014	10	11	1	22
2015	12	11	0	23
Total	**244**	**299**	**6**	**549**

Source: Authors' own construction based on the National Elections across Democracy and Autocracy (NELDA) database

It is imperative to note that, in Ethiopia, Lesotho, Libya and Morocco as well as Eritrea, the legislature votes into power the prime minister who exercises the executive powers of government, with some specifics. For instance, elections in Eritrea select representatives from the country's six regions for the National Assembly. Lesotho as well holds elections for their parliamentary seats and not the presidential. Libya holds national elections through a hierarchy of people's committees and then, the general people's congress elects the head of the government.

Table 2: Specific country-level Elections types events and their different years of occurrence, 1990-2015

N	Country	No. of elections	Presidential / Executive	Legislative / Parliamentary	Constituent Assembly
1	Algeria	10	1995, 1999, 2004, 2009, 2014	1991, 1997, 2002, 2007, 2012	
2	Angola	4	1992	1992, 2008, 2012	
3	Benin	18	1991(2), 1996(2), 2001(2), 2006(2), 2011	1991, 1995(2), 1999, 2002, 2003, 2007, 2011, 2015	
4	Botswana	5		1994, 1999, 2004, 2009, 2014	
5	Burkina Faso	11	1991, 1998, 2005, 2010, 2015	1992, 1997(2), 2007, 2012, 2015	
6	Burundi	7	1993, 2010, 2015	1993, 2005, 2010, 2015	
7	Cameroon	10	1992, 1997, 2004, 2011	1992, 1997, 2002, 2007, 2013(2)	
8	Cabo Verde	13	1991, 1996, 2001(2), 2006, 2011(2)	1991, 1995, 2001, 2006(2), 2011	
9	Central African Rep.	18	1992, 1993(2), 1999, 2005(2), 2011, 2015	1992, 1993(2), 1998(2), 2005(2), 2011(2), 2015	
10	Chad	10	1996(2), 2001, 2006, 2011	1990, 1997(2), 2002, 2011	
11	Comoros	18	1990, 1996(2), 2002, 2006, 2010	1990, 1992(2), 1993(2), 1996, 2004(2), 2009(2), 2015(2)	
12	Dem. Rep. of Congo	5	2006(2), 2011	2006, 2011	
13	Congo	14	1992(2), 2002, 2009	1992(2), 1993(2), 2002 (2), 2007(2), 2012(2)	
14	Côte d'Ivoire	11	1990, 1995, 2000, 2010(2), 2015	1990, 1995, 2000, 2001, 2011	
15	Djibouti	11	1993, 1999, 2005, 2011	1990(2), 1992, 1997, 2003, 2008, 2013	
16	Egypt	18	1993, 1999, 2005, 2012(2), 2014	1995(2), 2000(3), 2005, 2007, 2010(2), 2011(2), 2015	

17	Equatorial Guinea	8	1996, 2002, 2009	1993, 1999, 2004, 2008, 2013	
18	Eswatini	6	1993, 2003	1993, 1998, 2008, 2013	
19	Ethiopia	7		1995, 2000, 2005, 2010, 2015	1994(2)
20	Gabon	13	1993, 1998, 2005, 2009	1990(3), 1996, 2001(2), 2006(2), 2011	
21	Gambia	10	1992, 1996, 2001, 2006, 2011	1992, 1997, 2002, 2007, 2012	
22	Ghana	14	1992, 1996, 2000(2), 2004, 2008(2), 2012	1992, 1996, 2000, 2004, 2008, 2012	
23	Guinea	9	1993, 1998, 2003, 2010(2), 2015	1995, 2002, 2013	
24	Guinea-Bissau	16	1994(2), 1999, 2000, 2005(2), 2009(2), 2012, 2014(2)	1994, 1999, 2004, 2008, 2014	
25	Kenya	10	1992, 1997, 2002, 2007, 2013	1992, 1997, 2002, 2007, 2013	
26	Lesotho	5		1993, 1998, 2002, 2007, 2012	
27	Liberia	9	1997, 2005(2), 2011(2)	1997, 2005, 2011, 2014	
28	Libya	3		2012, 2014	2014
29	Madagascar	13	1992, 1993, 1996(2), 2001, 2006, 2013(2)	1993, 1998, 2002, 2007, 2013	
30	Malawi	10	1994, 1999, 2004, 2009, 2014	1994, 1999, 2004, 2009, 2014	
31	Mali	18	1992(2), 1997, 2002(2), 2007, 2013(2)	1992(2), 1997(3), 2002(2), 2007(2), 2013	
32	Mauritania	16	1992, 1997, 2003, 2007(2), 2009, 2014	1992(2), 1996(2), 2001(2), 2006(2), 2013	
33	Mauritius	6	1991	1995, 2000, 2005, 2010, 2014	
34	Morocco	5		1993, 1997, 2002, 2007, 2011	
35	Mozambique	10	1994, 1999, 2004, 2009, 2014	1994, 1999, 2004, 2009, 2014	
36	Namibia	10	1994, 1999, 2004, 2009, 2014	1994, 1999, 2004, 2009, 2014	
37	Niger	17	1993(2), 1996(2), 1999(2), 2004(2), 2011(2)	1993, 1995, 1996, 1999, 2004, 2009, 2011	
38	Nigeria	13	1993, 1999, 2003, 2007, 2011, 2015	1992, 1998, 1999, 2003, 2007, 2011, 2015	
39	Rwanda	5	2003, 2010	2003, 2008, 2013	
40	São Tomé and Prínc.	14	1991, 1996(2), 2001, 2006, 2011(2)	1991, 1994, 1998, 2002, 2006, 2010, 2014	
41	Senegal	11	1993, 2000(2), 2007, 2012(2)	1993, 1998, 2001, 2007, 2012	

42	Seychelles	13	1993, 1998, 2001, 2006, 2011, 2015(2)	1993, 1998, 2002, 2007, 2011	1992
43	Sierra Leone	10	1996(2), 2002, 2007(2), 2012	1996, 2002, 2007, 2012	
44	South Africa	5		1994, 1999, 2004, 2009, 2014	
45	Sudan	8	1996, 2000, 2010, 2015	1996, 2000, 2010, 2015	
46	Tanzania	13	1990, 1995, 2000, 2005, 2010, 2015	1990, 1995, 2000(2), 2005, 2010, 2015	
47	Togo	14	1993, 1998, 2003, 2005, 2010, 2015	1990(2), 1994(2), 1999, 2002, 2007, 2013	
48	Tunisia	12	1994, 1999, 2004, 2009, 2014(2)	1994, 1999, 2004, 2009, 2014	2011
49	Uganda	9	1996, 2001, 2006, 2011	1996, 2001, 2006, 2011	1994
50	Zambia	12	1991, 1996, 2001, 2006, 2008, 2011, 2015	1991, 1996, 2001, 2006, 2011	
51	Zimbabwe	12	1990, 1996, 2002, 2008(2), 2013	1990, 1995, 2000, 2005, 2008, 2013	
Total		**549**	**244**	**299**	**6**

Source: Authors' own construction based on the National Elections across Democracy and Autocracy (NELDA) database

Note: The numbers in parentheses (2/3) indicate the number of rounds that the elections took place.

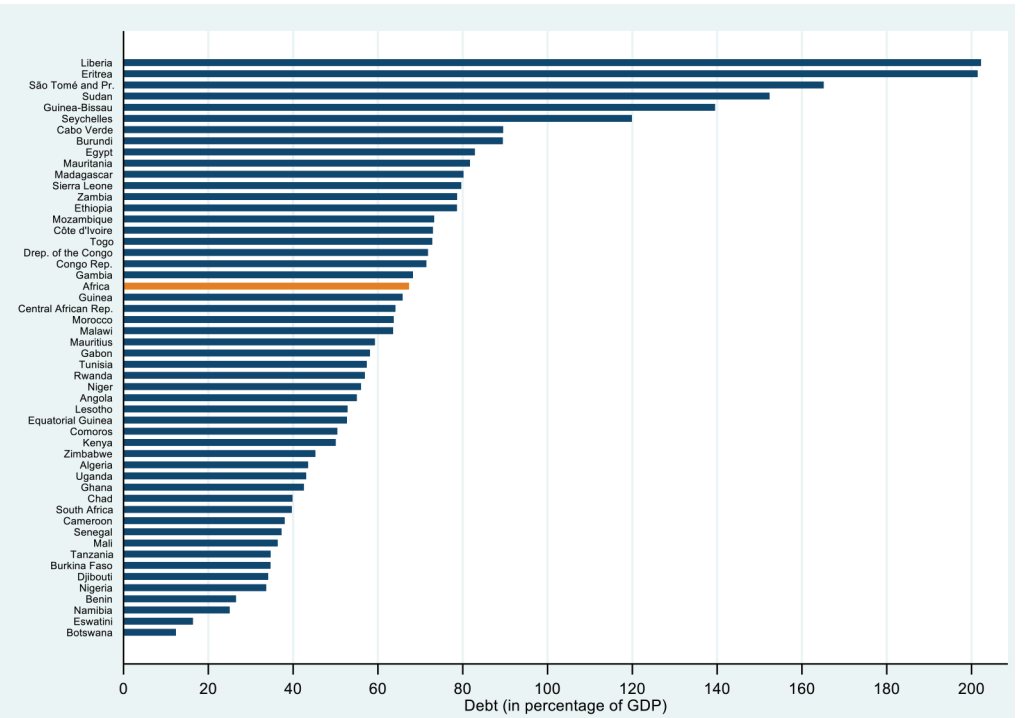
Morocco is run on Monarchy. There is a king. The King of Morocco chooses a President, just like a prime minister in other jurisdictions, from the largest party elected to parliament. The Constitution of Morocco grants executive powers to the government. In Botswana and South Africa's electoral system, Presidents are subsequently elected by members of the National Assembly following general elections. When we analyze the data at country level, Table 2 show that in Africa, eight countries including Benin, Central African Republic, Comoros, Egypt, Guinea Bissau, Mali, Mauritania and Niger record the highest number of election events of sixteen each at least (Table 2).

2.2. Overview of Africa's debt

The debate on debt is increasingly gaining traction especially among donors, multilateral banks and policymakers following the rise in the debt of African countries in recent years (Atta-Mensah and Ibrahim, 2020). The sharp rise in debt reminds us of the debt crisis of the 1990s when the Multilateral Debt Relief Initiative (MDRI) was adopted for the outright forgiveness of debt owed by a group of 36 low-income poor countries (IMF, 2019; World Bank, 2019). The MDRI was conditioned on sound economic management and poverty reduction strategies as well as assist countries to achieve the then Millennium Development

Goals (MDGs). Prominent of the debt relief was the Heavily Indebted Poor Countries (HIPC) initiative instituted by the International Monetary Fund (IMF) and World Bank in 1996 to address debt overhang in the poorest countries of the world (IMF, 2019). Following this initiative, 29 African countries were among the low-income countries to benefit from this debt relief (Atta-Mensah and Ibrahim, 2020).

FIGURE 1: DEBT-TO-GDP RATIOS OF AFRICAN COUNTRIES, FROM 1990-2018



Source: Authors' own construction, based on World bank data

To get an idea about the level of debt in African countries over the past few decades, we presented Figure 1, which exhibits debt-to-GDP ratios of 51 African countries from the period spanning from 1990 to 2018. It can be seen that Africa's debt as a share of GDP stood at 67.29% which is higher than the 55% debt-to-GDP ratio suggested by the IMF. It is even slightly above the debt benchmark ratio of 60% of GDP prescribed by the African Monetary Cooperation Programme (AMCP). At the country level, the figure (Figure1) shows the countries with a low debt ratio are: Zimbabwe, Algeria, Uganda, Ghana, Chad, South Africa, Cameroon, Senegal, Mali, Tanzania, Burkina Faso, Djibouti, Nigeria, Benin, Namibia, Eswatini and Botswana. In these countries'

debt-to-GDP level is less than 50%. Furthermore, with the exception of Liberia, Guinea-Bissau, Cabo Verde, Sierra Leone, Côte d'Ivoire and Togo, all Member-States of Economic Community of West African States (ECOWAS) registered debt-to-GDP ratios far less than the convergence requirement of 70%. Figure 1 shows that Eritrea, São Tomé and Principe, Sudan, Seychelles, Cabo Verde, Burundi, Egypt, Mauritania and Madagascar have debt-to-GDP ratios over 80% which are very high, pushing them potentially into high risk of debt distress.

3. Materials and methods

3.1. Data and preliminary finding

In this study, we construct a panel dataset of 51 African countries covering the period 1990–2015. The choice of these countries is based entirely on data availability for a sufficiently longer time period (the list of countries is presented in Figure 1 and Table 2). The data starts from 1990 mainly because most African countries embarked on their democratic dispensation from the 1990s (UNDP, 2016). The dataset is limited to 2015 because data on elections after 2015 are not available. We use the annual data sources from three different datasets. The first one is the National Elections across Democracy and Autocracy (NELDA) dataset that provides detailed information on all election events (Hyde and Marinov, 2019). To be included, elections must be for a national executive figure, such as a president, or for a national legislative body, such as a parliament, legislature, constituent assembly, or other directly elected representative bodies. The second dataset is the World Development Indicators (WDI) of the World Bank. Relying on the literature review (Forslund *et al*., 2011; Potrafke, 2018; Agbloyor, 2019 and Gomez-Gonzalez, 2019; Bayale, 2020a), we extracted from this dataset public debt and some explanatory variables including budget balance, inflation, real interest rate, GDP growth rate, investment, trade openness, natural resources rents, broad money supply (M2), reserves to total debt and population growth. And the third database is the International Country Risk Guide (ICRG) dataset that focuses on political risk and its components. Following Potrafke (2018), Sadik-Zada and Gatto (2019) and Bayale (2020a), indices we used from in this dataset are government stability and corruption (see Table 3).

Table 3: Summary of Data Sources of Variables used in the model

N°	Variables	Description	Sources
1	PRESID	Presidential elections events (n)	NELDA dataset
2	LEGIS	Legislative elections events (n)	NELDA dataset
3	ASSEM	Constituent Assembly elections events (n)	NELDA dataset
4	DEBT	Public debt (% of GDP)	WDI database
5	BUD_BAL	Budget balance (% of GDP)	WDI database
6	INFL	Inflation (%)	WDI database
7	INT_R	Real interest rate (%)	WDI database
8	GDPG	Gross Domestic Product (GDP) growth (%)	WDI database
9	INV	Investment (% of GDP)	WDI database
10	OPEN	Trade openness (%)	Computed, WDI
11	NAT_RESS	Natural resources rents (% of GDP)	WDI database
12	M2	Broad money supply (% of GDP)	WDI database
13	RES_TDEBT	International reserves to total debt	WDI database
14	POP_R	Population growth (%)	WDI database
15	GOV_STAB	Government Stability index	ICRG data
16	CORR	Corruption index	ICRG data

Source: Authors' own construction based on the National Elections across Democracy and Autocracy (NELDA) database

The descriptive statistics are presented in Table 4 below. We can notice that the present study relates to a non-balanced panel where certain variables such as inflation, government stability and corruption, present missing data for certain countries. The mean of public debt is about 66.46% of GDP over the sample period. This amount suggests that debt has been an important source of development finance for African countries. Compared to the mean of public investment which represents only 22.06% of GDP, the debt in African countries has exceeded the threshold of 50% of GDP (Drakes *et al*., 2012; IMF, 2019). So, the debt situation in Africa seems to be remarkable to the point that in April 2019, the International Monetary Fund (IMF) was saying that the half of African Low-Income Countries (LICs) are either in debt distress or at high risk of being so (IMF, 2019). Regarding elections events, they exhibit that the mean of elections was 0.16 (16%) for presidential elections, 0.19 (19%) for legislative elections and 0.003 (0.3%) for constituent assembly elections. This suggests that presidential and legislative elections each took place in almost 1/5th of the years of our study sample. As for the constituent elections, they are rare in this sample. Thus, presidential and legislative elections were held

in one of about every five or so years for the African countries. The budget balance represents on average more than 4% of GDP. This reflects a financing need that external resources such as debt would help to meet. Equatorial Guinea recorded the highest observation for budget balance and Sao Tome and Principe records the lowest. Inflation recorded a mean of 13.41%. This suggests that African countries have experienced high levels of macroeconomic imbalances. Zimbabwe recorded the highest inflation levels. Natural resources rents recorded a mean of 12.47% of GDP. Equatorial Guinea and Mauritius recorded the highest and lowest observation for natural resources rents, respectively.

Regarding the trade openness, this variable recorded a mean of about 40.94%. This suggests that African countries is open to trade within the continent as well as other continents countries. Also, Africa's international reserves to total debt recorded a mean of 94.87. Algeria and Liberia recorded the highest and lowest observation for reserves to total debt, respectively. Population growth recorded a mean of about 2.43%, suggesting that Africa has a high population growth rate. Regarding institutional variables, government stability recorded a mean of 2.15 of 12 whereas corruption recorded a mean of 0.95 of 6. These scores suggest high risk of government stability and corruption in Africa.

The correlation results are presented in Table 5. The correlations show a positive association between public debt and each type of election albeit weakness given the low size of the correlation coefficient. There is a negative correlation between budget balance and debt. We find also, negative correlation between real interest rate and debt. Natural resources rents and reserves to total debt are also correlated to debt negatively, whereas inflation, GDP growth and Investment are correlated to debt positively. Budget balance, investment, trade openness, natural resources rents and reserves to total debt are correlated to elections events negatively. There is a negative correlation between public debt and each two institutional quality indicators. Elections events are also positively associated to government stability and corruption. This suggest that the more elections took place, the more institutional quality is better.

Table 4: Summary Statistics

Variables	Observation	Mean	Standard deviation	Minimum	Maximum
Presidential elections	1,326	0.156	0.363	0	1
Legislative elections	1,326	0.187	0.391	0	1
Constituent Assembly elections	1,326	0.003	0.061	0	1
Public debt	1,301	66.468	59.926	0.488	547.727
Budget balance	1,160	-4.052	29.883	-662.416	124.112
Inflation	857	13.411	36.607	-29.205	598.7
Real interest rate	1,239	2.089	1.970	0	31.608
GDP growth	1,319	4.182	8.837	-61.4	149.973
Investment	1,291	22.064	15.876	-2.424	219.069
Trade openness	1,301	40.937	38.492	3.571	380.430
Natural resources rents	1,301	12.474	12.626	0.001	84.239
Money M2	1,221	18.408	25.546	-67.339	574.91
Reserves to total debt	1,279	94.869	330.674	0.01	3717.649
Population growth	1,326	2.435	1.095	-6.542	8.457
Government Stability	936	7.885	2.151	1	11.583
Corruption	936	2.311	0.955	0	5

Source: Authors' own construction based on the National Elections across Democracy and Autocracy (NELDA) database

From the foregoing, the correlation matrix generally is insufficient to fully appreciate the quality of the relationships between the variables described, because correlations only show the relationship between the two variables without controlling for the effect of the other variables. Therefore, we perform econometric analysis by discussing our empirical strategy below.

TABLE 5: SUMMARY STATISTICS

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Presidential elections (1)	1.000															
Legislative elections (2)	0.051	1.000														
Constituent Ass. elections (3)	0.037	0.043	1.000													
Public debt (4)	0.061	0.026	0.044	1.000												
Budget balance (5)	-0.081	-0.071	-0.210	-0.161	1.000											
Inflation (6)	-0.002	-0.036	0.037	0.154	-0.178	1.000										
Real interest rate (7)	-0.123	-0.045	0.028	-0.223	0.158	-0.102	1.000									
GDP growth (8)	0.005	0.049	-0.121	0.066	0.328	-0.007	-0.055	1.000								
Investment (9)	-0.063	-0.042	-0.052	0.149	0.007	-0.051	0.027	0.076	1.000							
Trade openness (10)	-0.055	-0.028	-0.017	-0.07	0.235	-0.104	0.254	0.029	0.185	1.000						
Natural resources rents (11)	-0.036	-0.007	0.057	-0.047	0.302	0.090	0.113	0.070	0.019	0.342	1.000					
Money M2 (12)	0.003	-0.004	-0.007	0.072	0.035	0.004	-0.108	0.142	-0.051	0.024	0.213	1.000				
Reserves to total debt (13)	-0.059	-0.017	0.047	-0.338	0.045	-0.062	0.169	-0.060	0.114	0.235	0.258	-0.021	1.000			
Population growth (14)	0.068	-0.031	-0.052	0.117	0.079	0.118	-0.374	0.101	0.073	-0.154	0.144	0.166	-0.276	1.000		
Government Stability (15)	-0.062	-0.003	-0.101	0.035	0.274	-0.125	0.066	0.073	0.174	0.094	0.118	0.055	0.031	-0.079	1.000	
Corruption (16)	-0.054	-0.033	-0.007	0.091	-0.002	0.002	0.082	-0.087	0.164	0.049	-0.303	-0.071	-0.011	-0.031	0.622	1.000

Note: Three types of elections events are taken into account to this study, based on the NELDA dataset: Presidential elections events, Legislative elections events and Constituency Assembly elections events. Each electoral event is dummy variable taking on a value of 1 in a year of elections and zero otherwise. Public debt is the total debt owed by government to domestic residents, foreign nationals and multilateral institutions such as the IMF, expressed as a percentage of GDP. Budget balance is the Government receipts minus government outlays, as a percentage of GDP. Inflation is the consumer price index. Real interest rate is the interest payments made on medium- and long-term debt in current year. GDP growth is growth in GDP. Investment is the gross fixed investment expenditure at current market prices, as a percentage of GDP. Trade openness is the sum of exports and imports divided by GDP. Natural resources rents are divided by GDP. Money M2 is money supply divided by GDP. Reserves to total debt is total international reserves as a percentage of total external debt stock. Population growth is the growth in population. Government Stability and Corruption are institutional variables extracted from ICRG.

3.2. Model specification and empirical strategy

3.2.1. Model specification

In this section, we present the following equation that examining the effect of the types of elections on public debt:

$$DEBT_{i,t} = \alpha + \beta_i Elections_{i,t} + \sum_{i=1}^{N} \gamma_i X_{i,t} + \varepsilon_{i,t} \quad (1)$$

with elections defined as followed:

$$\text{Elections}_{\text{i,t}} = \begin{bmatrix} \text{Presidential elections} \\ \text{Legislative elections} \\ \text{Constituent Assembly elections} \end{bmatrix} \quad (2)$$

and the composite error term $\varepsilon_{i,t} = v_i + \eta_{i,t}$

The dependent variable in this model is public debt. This is measured as the total debt owed by government to domestic residents, foreign nationals and multilateral institutions such as the IMF, expressed as a percentage of GDP. The elections types variables were obtained from NELDA dataset which indicate when and what type of elections were held in a particular country (Hyde and Marinov, 2019). These elections variable was constructed as a dummy, with a value of 1 in election years and 0 otherwise. β_i represents the coefficients of different types of elections. The vector $X_{i,t}$ contains a list of control variables which are obtained based on the standard literature. These include budget balance as a percentage of GDP; inflation measured by the consumer price index (Gomez-Gonzalez, 2019); real interest rate and GDP growth (Bohn and Veiga, 2019); investment as a percentage of GDP (Sadik-Zada and Gatto, 2019); trade

openness is the sum of exports and imports divided by GDP; natural resources rents are divided by GDP (Forslund *et al*., 2011); broad money supply (M2), divided by GDP; total international reserves as a percentage of total external debt stock and population growth (Sadik-Zada and Gatto, 2019; Potrafke, 2019). This variable contains institutional variables: government stability and corruption are institutional variables extract from International Country Risk Guide (Potrafke, 2019; Bohn and Veiga, 2019; Agbloyor, 2019).

In terms of sign expectations of explanatory variables, not exhaustively, we expect a positive relationship between elections events and public debt. Bohn and Veiga (2019) finds a positive relationship between elections events and public debt in Portugal. We expect a positive relationship between debt and budget balance. We expect a negative relationship between trade openness and public debt because the more you trade, the less the country need debt (Forslund *et al*., 2011). We expect either a positive or negative relationship between natural resources rents. For instance, a positive relationship suggests that natural resources attract debt in African countries. Also, we expect the positive relationship between investments and debt because, in many African countries, debt is may be used for investment. A negative relationship between inflation and public debt is expected (Gomez-Gonzalez, 2019).

3.2.2. Empirical strategy

This study seeks to answer whether the elections events contribute to public debt accumulation in African countries. In other words, if the elections events constitute a determinant of public debt. The argument made is that, due to the high cost engendered by the elections events, governing parties contract loans either to finance directly the electoral operations, or to undertake public investments (the policy of the large structuring building sites) intended to influence the voters in their favor as they expect to be re-elected. The assumption is that, these incentives to go into debt are higher during the pre-electoral and electoral years compared to the non-electoral years. If this assumption is true, then the magnitude of the effect of electoral events on the accumulation of public debt should be greater during the pre-electoral and electoral years than during the non-electoral years. Knowing that, our empirical results based on the estimation of equation (1) would be consistent across two types of estimation procedures. We first employ a fixed effects model to address unit heterogeneity (Wooldridge, 2019; 2016), given the expected country-specific differences in the time-series cross-sectional data. Moreover, the results of a Hausman test

also favour a fixed effect over a random effects specification, rejecting the null hypothesis $X^2_{(15)}=36.58$, corresponding to a probability of 0.0015, that both methods of estimation are very consistent.

However, a potential problem with the fixed effects specification is that this approach does not take into account for potential bias of endogeneity. This problem paramount in panel data where the time T is quite small. In social science data sets like ours with a $T \geq 20$, scholars have found that the potential bias from using a fixed effects estimator in these regressions is likely to be quite small (Wilson and Butler, 2007; Kaplan *et al*., 2017). We therefore resolve these problems relying on the dynamic panel generalized method of moments (GMM) estimation approach (Arellano and Bond 1991; Roodman, 2009) where we can estimate using the first difference or system GMM after introduction of the lag of the public debt. Since v_i may be correlated with other regressors, we can first difference to eliminate the country-specific effect. However, this approach has very poor finite properties both in terms of bias and precision, especially when the explanatory variables are persistent over time as their lagged values tend to be weak instruments and predictors of endogenous changes (Blundell and Bond, 1998). In that case, the appropriate technique capable of yielding consistent and unbiased estimates is the system GMM which rests on the combination of the system regression in differences with the regression in levels (Arellano and Bover, 1995; Blundell and Bond, 1998). In that process, two tests will be important: the serial correlation test which examines the null hypothesis that the error term is serially uncorrelated and the Sargan's test examines the exogeneity of the instruments. At the same time, the system GMM results will be used for robustness checks.

4. Main results and discussion

4.1. Baseline results

We present our results using both fixed effects and GMM estimators. In Table 6, we present the fixed effects results that estimate the effect of elections on public debt. Five equations are estimated. The equation (I) is where the level public debt is explained only by presidential elections, legislative elections and constituent assembly elections. The equation (II) takes into account variables of interest and corruption. The equation (III) resumes the second equation by replacing corruption by government stability because there is a high correlation these two institutional variables (Table 5). The equation (IV) take back the second one by adding some economic variable, vice versa for the equation (V).

Table 6: Baseline Results: Fixed Effects (FE) estimations

	[I]	[II]	[III]	[IV]	[V]
CONS	6.644* (0.079)	4.666* (0.082)	5.6851* (0.074)	10.085 (0.541)	10.116 (0.492)
PRESID	0.360* (0.062)	0.471* (0.085)	0.478* (0.081)	0.319* (0.075)	0.289* (0.058)
LEGIS	0.355 (0.421)	0.352 (0.473)	0.386 (0.434)	0.472 (0.899)	0.565 (0.882)
ASSEM	0.027 (0.256)	0.028 0.219)	0.028 (0.213)	0.013 (0.391)	0.015 (0.327)
BUD_BAL	- -	- -	- -	-0.255** (0.030	-0.380** 0.014
INFL	- -	- -	- -	-0.282*** (0.004)	-0.3501*** (0.001)
INT_R	- -	- -	- -	-1.034 (0.324)	-0.776 (0.470)
GDPG	- -	- -	- -	-.0793 (0.711)	-0.101 (0.648)
INV	- -	- -	- -	2.002*** (0.000)	1.896*** (0.000)
OPEN	- -	- -	- -	0.391*** (0.005)	0.3192** (0.027)
NAT_RESS	- -	- -	- -	-1.188*** (0.000)	-1.04*** (0.000)
M2	- -	- -	- -	0.070 (0.495)	0.066 (0.539)
RES_TDEBT	- -	- -	- -	-0.006 (0.112)	-0.009 (0.027)
POP_R	- -	- -	- -	1.255* (0.074)	0.548 (0.210)
CORR_COT	- -	-0.699** (0.006)	- -	-1.359*** (0.000)	- -
GOV_STAB	- -	- -	-0.665 (0.514)	- -	-1.142 (0.206)
R^2	0.49	0.52	0.51	0.67	0.63
Prob. Fisher	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	1,326	1,326	1,326	1,326	1,326
No. of Countries	51	51	51	51	51

Note: *, ** and *** respectively denote significance at 10%, 5% and 1%.

According to the reported results, there is a positive relationship between elections and public debt accumulation. Given the positive effect, our evidence suggests that, relative to pre-election period, there is about 36% probability

that presidential election periods are characterized by higher debt. While the coefficients of the legislative and constituent assembly elections are also positive, none of them statistically significant at conventional levels. This finding holds even after including control of corruption in the regression (see II). Anecdotally, in democratic governments, there tend to be uncertainty in terms of re-election and hence they tend to please the electorates by spending on social capital, health and education in order to be voted leading to accumulation of more debt in the process than autocratic regimes that may not need to be voted into power. On the effects of the elections on public debt, our results seem to corroborate with the findings of Bohn and Veiga (2019) who analyzed the relationship between elections, recession expectations and excessive debt in Portuguese municipalities. The authors found that policymakers expecting a recession during an election year allow the primary deficit to increase even more when the stock of debt is very high. Also, Agoba *et al*. (2020) investigated if the behavior and effectiveness of Central bank independence (CBI) on fiscal policy varies between non-election and election years. Authors have examined whether the effectiveness of CBI in improving fiscal performance is enhanced by higher institutional quality by using recent CBI data on 48 African countries, 90 other developing countries and 40 developed countries.

Agoba *et al*., (2020) observed that, in Africa, the magnitudes of the CBI coefficients are smaller in election years than in nonelection years. This means that the impact of CBI on reducing net central bank claims on government is lower in election years than in non-election years, though not significantly (Agoba *et al*., 2020). When examining the relation between foreign direct investment (FDI), elections and welfare in Africa, Agbloyor (2019) did not find a significant relationship between elections and FDI flows. This means that elections play no significant role in influencing FDI flows. In contrary to Agbloyor's (2019) results, Julio and Yook (2016) found a negative relationship between elections and FDI in 44 countries. For Frantz (2019) and Goldsmith (2019) who analyzed the effects of elections on capital flight in Africa, basing on the assumption that elections follows an electoral cycle, the authors found that capital flight is higher during election years compared to other times.

Thus, the evidence reveals that in our case, only the presidential elections matter for the debt dynamics in Africa given the insignificance of the other types of elections. Probably because, legislative and constituent assembly elections mobilize far fewer public resources than presidential elections. This does not mean that African countries must slow down their progress towards

the democratic process by limiting the number of elections. Instead, countries should rather rationalize public resources, particularly before and during the electoral years in a way that limits waste of resources (Bayale, 2020b; Bayale, 2019).

Turning to the control variables, the Table 6 shows a negative and significant relationship between budget balance and public debt. As most of African States accumulate budget deficits, our results suggest that African countries are obliged to borrow in order to finance their deficit. The result is then an accumulation of public debt. We also found a negative and significant relationship between inflation and public debt. Inflation had a negative relationship with public debt. This suggests that macroeconomic instability discourages loans flows because of the increased uncertainties (Agbloyor, 2019). On the inflation-linked public debt in emerging economies during crises, Gomez-Gonzalez (2019) reported a set of stylized facts about inflation-linked public debt in emerging economies. The study found evidence of inflation-linked rates decreasing in about half of the most recent crises in emerging economies. Investment and trade openness have a positive effect on public debt. Indeed, the results suggest that more open economies are likely to have high debt levels compared with those who are less open to trade, as the coefficient of that variable is positive and significant (Sadik-Zada and Gatto, 2019, Bayale, 2020a). This is consistent with Forslund et al. (2011) who found the effect of openness to be positively related to external debt in a group of middle-income countries. We find that natural resources have a negative effect on public debt in Africa. This suggests that countries endowed with natural resources tend to not receive more loans. By focusing on the determinants of the public debt and the role of the natural resources in 184 countries, Sadik-Zada and Gatto (2019) found a negative relationship between oil rent as a share in total public revenue and the public debt. According to their results, an increase of the oil revenues by 1% leads to a decrease of the public debt by 1.96% (Sadik-Zada and Gatto, 2019). Moreover, we find that reducing corruption reduces public debt significantly (Potrafke, 2018). This suggest that an uncorrupted government favors a better domestic resources mobilization as well as their better channel towards productive investments. Regarding non-significant variables, Table 6 show that interest rate, GDP growth rate, international reserves to total debt, population growth and government stability have negative coefficients wile broad money supply have positive coefficients.

4.2. Robustness check

In the robustness analysis, we control for the endogeneity through our usage of the system GMM. Table 7 presents the findings of GMM estimations.

Table 7: Robustness check: System GMM estimation results

	[I]	[II]	[III]	[IV]	[V]
CONS	4.968*	2.902	8.590	1.96564	1.6252
	(0.082)	(0.103)	(0.221)	(0.378)	(0.771)
DEBT_1	0.884***	0.865***	0.874***	0.849***	0.874***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PRESID	0.373*	0.3201*	0.281*	0.138*	0.190*
	(0.056)	(0.069)	(0.077)	(0.084)	(0.092)
LEGIS	0.161	0.191	0.208	0.121	0.633
	(0.112)	(0.247)	(0.366)	(0.204)	(0.433)
ASSEM	0.016*	0.027	0.017	0.044	0.073
	(0.081)	(0.069)	(0.053)	(0.373)	(0.336)
BUD_BAL	-	-	-	-0.140**	-0.205**
	-	-	-	(0.025)	(0.026)
INFL	-	-	-	-0.151**	-0.119*
	-	-	-	(0.025)	(0.099)
INT_R	-	-	-	-0.256	-1.131
	-	-	-	0.758)	(0.137)
GDPG	-	-	-	0.123	0.152
	-	-	-	(0.362)	(0.327)
INV	-	-	-	0.523	0.523
	-	-	-	(0.198)	(0.193)
OPEN	-	-	-	0.187**	0.169**
	-	-	-	(0.027)	(0.034)
NAT_RESS	-	-	-	-0.058*	-0.091*
	-	-	-	(0.036)	(0.042)
M2	-	-	-	0.025	0.015
	-	-	-	(0.507)	(0.734)
RES_TDEBT	-	-	-	-0.021	0.001
	-	-	-	(0.322)	(0.538)
POP_R	-	-	-	0.841	0.433
	-	-	-	(0.538)	(0.359)
CORR_COT	-	-0.996***	-	-2.086**	-
	-	(0.001)	-	(0.016)	-
GOV_STAB	-	-	-0.477*	-	-1.631
	-	-	(0.074)	-	(0.269)
Observation	1326	1326	1326	1326	1326
Nb. of countries	51	51	51	51	51
Nb. of instruments	29	34	34	47	47
AR (1)	(0.000)	(0.004)	(0.005)	(0.000)	(0.000)
AR (2)	(0.379)	(0.631)	(0.611)	(0.247)	(0.562)
Hansen test	(0.769)	(0.132)	(0.108)	(0.752)	(0.745)

Note: *, ** and *** respectively denote significance at 10%, 5% and 1%.*, ** and *** respectively denote significance at 10%, 5% and 1%. AR (1) and AR (2) respectively represent the first and second order serial correlation.

The bottom part of the table shows the Hansen test of over identifying restrictions tests the overall validity of the instruments and failure to reject the null hypothesis gives support for the model, including our choice of endogenous variables. The Arellano-Bond test for AR (2) in first differences tests whether the residuals from the regression in differences is second order serially correlated. The model adequacy is apt based on all the diagnostic tests. We take account of persistence of the stock of public debt by including the lagged dependent variable as a regressor. We can notice that its coefficient is positive, significant and stable whatever the equation (I to V). When we compare results presented in Table 7 with those obtained using fixed effects approach (Table 6), specifically regarding our variables of interest, the results are consistent and qualitatively similar to those obtained earlier. There is a positive relationship between elections and public debt and only significant with presidential elections.

5. Concluding remarks

In this paper we use data is obtained from the National Elections across Democracy and Autocracy (NELDA) dataset and the World Development Indicators of the World Bank over a period spanning from 1990 to 2015 to analyze whether elections events influence the public debt dynamic in 51 African countries. We start by positioning our study compared to the existing economic literature. We also presented an overview on elections, political regimes and debt in African countries. We exhibited data sources and some preliminary statistical analysis related to the relationship between political institutions in public debt accumulation. After that, we then applied fixed effects approach to achieve the objective of the study. While the approach used for analysis was satisfactory, the system generalized method of moments (GMM) that provided other estimates were consistent with the initial findings.

The empirical findings support the fact that, there is a positive relationship between elections and public debt. However, that relationship is only significant for the impact of presidential elections. While the coefficients of the other legislative and constituent assembly elections are positively relative to debt, their statistical impact is benign. Indeed, these findings hold regardless of the estimated equation and the estimation approach applied.

This result implies that improving and diversifying the method of financing of the political regimes as well as strengthening institutions, accountability and

economic governance by governments is critical in managing and controlling the level of indebtedness for debt sustainability in Africa. This paper can therefore be thought of a shift from the standard paradigm linking political factors in the accumulation of debt in Africa.

Future research might take into account further research questions arising from this study. Upcoming research should not ignore the effect of political factors on debt accumulation in Africa by Regional Economic Communities (RECs), specific countries and by political regime types (democratic regimes and autocratic regimes), in order to allow comparisons to be made.

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