DYNAMICS AND STABILITY ANALYSIS OF PARTY SWITCHING IN POLITICS OF NIGERIA: A MATHEMATICAL APPROACH

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Abstract: Democratic consolidations in Nigeria have been hampered by the incessant decamping of political office holders and gladiators. In an attempt to provide a theoretical basis to study the dynamics of party switching in Nigeria, we formulate a new deterministic compartmental model. We prove the positivity of solutions of the model, conduct the stability analysis via the principle of stability of nonlinear differential equations and carry out simulations to verify the theoretical results. Findings from the simulation show that political office holders lose their places in the hearts of the electorates when they fail to deliver electoral promises which prompts party defection.

Keywords: defection; democracy; political party; electorates; model.

1. INTRODUCTION

Democracy is a system of government which is defined as a government of the people by the people and for the people. The formation of a democratic government is a function of the emergence of political parties. The Political party is a polysemous word. However, the point of convergence of the different definitions given by the scholars is based on the fact that political parties are the major institutions for organising a democratic government. Max Weber as cited in [1] describes the political party as contending groups which struggle for political power within corporate bodies. The definition puts candidates and politicians for the recruitment of leadership into both appointive and elective positions as principal gladiators and the aim of party formation is to seize governmental powers. Also, Likoti [2] argues that a political party is a group of people that is well organised with common political opinions and objectives that attempt to influence public policies by getting its candidates elected to public offices. The context and theme of the definition of the political party as given by [2] suggest that the main objective of a political party is to participate and win an election in order to dominate and organise the structure of national leadership.

Herbert [3] describes the political party as a social group characterised by a system of symbiotic activities and a high degree of the logical direction of behaviour towards the actualisation of common expectation and acknowledgement. Herbert's definition revealed that the party exists to protect national interest based on specific principles (ideology) and not personal or sectional interest. Clearly, the meaning of a political party makes it quite unique from other social groups like Labour Unions because of their rare features. One of the features is ideology. An ideology is a set of principles or philosophy that determines a political programme. The ideology of a political party is written and contained in what is termed manifesto (or action plan or blueprint). The manifesto is made up of the principle and goals the party pledges to pursue if elected into power. As an agreement with the voters, the manifesto outlines the party's perception of the nation's challenges and spells out how the party plans to address the challenges and helps realise the mutual aspirations of the country if voted into power. Another basic feature of political parties is the membership base. Political parties recruit individuals who are committed to their principles and ideology and who are ready to participate in policy formulation, party governance, and campaigning. The policies and ideology of a political party are often shaped by the members of the party [4].

Multiparty democracies are anchored on multiple-parties, where one party acts as the ruling party and other parties as alternatives or oppositions. Sadly, less developed countries like Nigeria are characterised by persistence and major problem: frequent party switching among elected political gladiators which tends to impede democratic consolidation. Party switching, otherwise known as cross-carpeting, floor-crossing, party-hopping, party defection, decamping, canoe-jumping or party

jumping, according to [5], [6] and [7] occurs when politicians move from one political party to another as a result of countless of reasons such as power tussles, personality clash, disagreement over an issue, division or crisis within the party, actualisation of personal political ambition, and conflicting views on the working and operations of the ideology or philosophy of the political party [8]. The first party defection occurred in Nigeria in 1951 and was motivated by religion preferences and ethnic affiliation. It was a calculated attempt to prevent Dr Nnamdi Azikiwe, an Igbo man, from emerging the premier of Western Region. To frustrate Azikiwe's dream, the Yoruba members in the National Council for Nigerian and Cameroon (NCNC) were lobbied to defect to the Action Group (AG) [9].

It is necessary to understand that party switching is not unlawful, but it is illegal when such defection is not as a result of any concrete sign of internal crisis or divisions or lack of ideological commitments. Party switching is a global phenomenon which has been reported in developed countries like the US, Great Britain, Italy and other countries like Poland, India, Philippines and Ukraine [10]. However, the rationale behind party defection in Nigeria is different from the rationale behind it in many countries of the world where party switching is hinged on politicians rejecting to aid their political parties in coalition government [11]. In Nigeria, defection is not based on the formation of new parties nor coalition government or ideological differences but on self-interest, concern for financial gains and the strategy to remain relevant after the general election. Party switching is motivated by the need for political relevance, political opportunities, political survival and a strategy to avoid being kept in the political coolers [12]. One of the bases for party switching in Nigeria is an attempt to win the general election. Defection has conceived a weapon necessary to stand a chance of either picking a party ticket or retaining a political office in on-coming general election [13]. Udo [14] argues that Nigerian politicians move from one party to another just to cater to their selfish interest. Udo asked for the explanation of what made a politician switched from one political party to another and then defected back to the original political party within short period of time under conditions that applauded disregard for ideologies and principles as in the case of Alhaji Atiku Abubakar former vice president of the federal republic of Nigeria who is regarded as the most defected politician in recent times [15].

Nigerian politicians jump from party to party to actualise their ambitions. For example, the current president of Nigeria, Muhammadu Buhari started from All Nigerians Peoples Party (ANPP) in 2003 before defected to Congress for Political Change (CPC) in 2009 and finally moved to All Progressive Congress (APC) in 2013 to win 2015 presidential election. Also, Alhaji Atiku Abubakar, in an attempt to become the president of Nigeria, defected from People's Democratic Party (PDP) in 2006 to Action Congress (AC) then defected back to People's Democratic Party (PDP) in 2009 then defected again to All Progressive Congress (APC) in 2013 and also defected back to People's Democratic Party (PDP) in 2017 to contest for president in 2019 general election. In the same manner, the senate president of the 8th National Assembly, Senator (Dr.) Abubakar Bukola Saraki was the governor of Kwara State for eight years under the umbrella of PDP. He also won election into the senate in 2011 under the banner of PDP as well but switched to APC when he could not pick the presidential ticket of PDP for 2015 general election. He contested 2015 general election with the ticket of APC and won to become the senate president. Now that the pendulum could not swing his way for the APC presidential ticket, he defected back to PDP to re-contest in 2019 general election.

Party switching has made politics a dirty game in Nigeria with some assassinations recorded after defection. A good example is the murder of PDP South-South leader after he defected from PDP to ANPP and the gruesome murder of Akwa Ibom State former Deputy Speaker of House of Assembly after he switched to APC from PDP to contest for the State House of Assembly in the 2015 general election. It has also made a mockery of Nigeria democracy. One of the ways by which party- switching has adversely ridiculed Nigeria's democracy is that it has labelled Nigerian politicians political prostitutes. Odum [16] declares that prostitutes and politicians are two parallel professionals. While the former is borne out of social decadence, the latter is rooted in the constitution. The converging point or common denominator for the two seems to be their allegiance which is based on no preference. So, while the politicians change political parties, the prostitutes change beds. Party defection has resulted in grave enmity among political gladiators and political parties to the degree that unconstructive criticism, unhealthy rivalry and hate speeches have become the order of the day in the Nigeria political landscape [17]. Party-switching has also resulted in over politicisation of insurgency in the North East where Boko Haram insurgents have claimed more than 20 000 lives [9]. Politicians are shifting blames instead of joining hands to defeat the insurgency. It is also interesting to stress that party switching has made the

electorate lost hope and confidence in their representatives. Besides, the way and manner by which politicians defect from party to party without a sense of national interest have made them objects of ridicule, shame and laughter to the degree that some of them are stoned publicly by the electorate.

A good number of researches have been conducted on party switching scenario in Nigeria. For example, [1] examined the cases and causes of party switching in Nigeria's Fourth Republic and discovered that party switching was patterned by the ethnic/religion inclination, self-interest of the politicians and intra-party feud. The researchers also discovered that party switching in Nigeria's Fourth Republic was also anchored on poor ideology and gross indiscipline among political parties. They, therefore, concluded that the menace of frequent party-switching among political office holders in Nigeria could be well checked if party discipline and ideology were strictly adhering to. [7] also x-rays the consequence of Local Government elections conducted in Kogi State in May 4, 2013. The researcher explains the rationale behind party- switching before and after the election and why the politicians play "politics" with such party-switching. Aleyomi, therefore, concluded that fair representation, accountability, good governance, democratic consolidation and purpose of democracy will be defeated if politics of party switching should continue.

Also, [17] conduct a study and explain the rationale and politics of defection of many law makers at the House of Representatives in 2014. They also explain the implication of the defection on democratic consolidation. The researchers argue that unruly defection of the law makers is prompted by the weakness of Section 68(1) (g) of the 1999 constitution. Studies on party switching in Nigeria can also be found in [15] and [19]. Of all the existing works on party switching, the use of mathematics to conduct the study is rare. The existing works lack mathematical analysis and it is against this backdrop that the present study is aimed at using mathematical modelling to analyse the dynamics of party switching in the Nigeria political terrain. Mathematical modelling is defined in [20] as "the process of evaluating a mathematical representation of some phenomena in order to gain a better understanding of those phenomena". Mathematical models had been used both numerically and analytically to give understanding into the processes of a good number of real-life phenomena e.g. media impact on a new product innovation diffusion [21], rumour [22], construction activities [23], poverty and crime [24], blood flow and blood pressure [25], inequality, expectation and extremism. While mathematical studies of real-life phenomena are exhaustive, we are not aware of the one that is directed to the dynamics of party switching in politics with reference to the situation in Nigeria.

2. MODEL FORMULATION

Nigeria practices multiparty system but two political parties do dominate the political terrain as in the case of the present Fourth Republic where People's Democratic Party (PDP) and All Progressive Congress (APC) have dominated political landscape. The PDP dominance of the political sphere since the inception of Fourth Republic in 1999 came to an end in 2013 when the political calculation gave birth to APC from the merging of four major political parties – All Progressive Grand Alliance (APGA), All Nigerians Peoples Party (ANPP), Action Congress of Nigeria (ACN) and Congress for Progress Change (CPC). One election period is considered. In accordance with the constitution, a candidate is elected to serve a term of four years after which he is eligible to re-contest for another four years if he was a president or governor. Other political office holders can re-contest for as many times as possible. It is on this ground that we considered two political parties *A(t)* and *B(t)*. We also considered the compartments for the politicians, the political offices and the electorate denoted by *C(t), D(t)* and *E(t)* respectively. α and β are the rates at which politicians move to parties *A(t)* and *B(t)* respectively. γ and θ are the rates at which the electorate votes for candidates in parties *A(t)* and *B(t)* respectively with $\gamma > \theta$. δ and ε are the rates at which parties *A(t)* and *B(t)* won political offices respectively with $\delta > \varepsilon$. τ and σ are the rates at which political office holders from parties *A(t)* and *B(t)* deliver electoral promises to the electorate respectively. After four years, political office holders in party *A(t)* wished to re-contest the election but they failed to deliver electoral promises and disappointed the electorate while in office. As a result, the electorates are not willing to vote for them again. Besides, their political party, party *A(t)* is not willing to field them at an election for fear of losing the election. They, therefore, defect to party *B(t)* to realise their ambition since the electorates are fed up of party *A(t)* and ready to vote any candidates from party *B(t).* This mentality gave All Progressive Congress (APC) edge during the 2015 general election. Most politicians who won the 2011 general election with the tickets of People's Democratic Party (PDP) defected to APC to contest 2015 general

election and won. It was due to the fact that the electorates were fed up of PDP administration and determined to vote it out in 2015. The electorates were brainwashed with the promise of "change" by the APC and were mad at voting for the candidates of APC in 2015 general election. The transfer diagram among the compartments is illustrated in *Fig.* 1. Note that human beings (politicians) in *A(t)* and *B(t)* constitute *D(t)* after victory at the poll. Also, τ and σ do not increase the population of individuals in *E(t)* but their welfare though they would be considered in the equation for *E(t)*. The two parameters have a significant influence on the level of participation of the electorates at the poll.

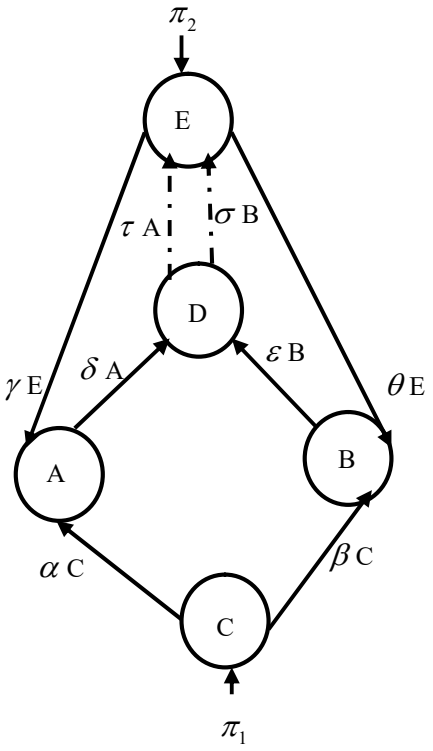

Fig. 1. Transfer Diagram of the Model

Going by the above assumptions and flow diagram, we come about the following set of first order ordinary differential equations.

$$\frac{dA}{dt} = \gamma E + \alpha C - \delta A \tag{1}$$

$$\frac{dB}{dt} = \beta C + \theta E - \varepsilon B \tag{2}$$

$$\frac{dC}{dt} = \pi_1 - \alpha C - \beta C \tag{3}$$

$$\frac{dD}{dt} = \delta A + \varepsilon B - \tau D - \sigma D \tag{4}$$

$$\frac{dE}{dt} = \pi_2 - \theta E - \gamma E + \tau A + \sigma B \tag{5}$$

The numerical values assigned to the parameters to conduct the simulations are presented in Table I.

TABLE I. PARAMETERS DESCRIPTION AND VALUES

Parameters	*Symbols*	*Values*
Recruitment rate of the politicians $C(t)$	π_1	0.001
Recruitment rate of the electorate $E(t)$	π_2	0.100
Rate of influx of the politicians into $A(t)$	α	0.003
Rate of influx of the politicians into $B(t)$	β	0.001
Rate at which the electorate votes candidates in $A(t)$	γ	0.100
Rate at which the electorate votes candidates in $B(t)$	θ	0.050
Rate at which candidates in $A(t)$ won political offices	δ	0.400
Rate at which candidates in $B(t)$ won political offices	ε	0.100
Performance rate of political office holders in $A(t)$	τ	0.010
Performance rate of political office holders in $B(t)$)	σ	0.001

3. THE MODEL ANALYSIS

3.1. Positivity of Solutions.

Since the model monitors human population, it is assumed that there exists a nonnegative initial condition for the state variables. We shall show that the solutions of the model are positive.

Theorem1.Let $\Omega =$

$$\left\{ \begin{matrix} \left(A,B,C,D,E\right) \in \Re_+^5 : A_0 > 0, B_0 > 0 \\ C_0 > 0, D_0 > 0, E_0 > 0 \end{matrix} \right\};$$

therefore the solutions of $\{A,B,C,D,E\}$ are positive for $t \geq 0$.

Proof. From the model equations, consider (1)

$$\frac{dA}{dt} = \gamma E + \alpha C - \delta A \Rightarrow$$

$$\frac{dA}{dt} \geq -\delta A \Rightarrow$$

$$\frac{dA}{A} \geq -\delta dt \Rightarrow$$

$$\int \frac{dA}{A} \geq -\int \delta dt$$

Using separation of variable method and applying the initial condition, we obtain

$$A(t) \geq \mathrm{A}_0 e^{-\delta t} \geq 0 \ . \tag{6}$$

Also, taking (2), that is,

$$\frac{dB}{dt} = \beta C + \theta E - \varepsilon B$$

it is true that

$$\frac{dB}{dt} \geq -\varepsilon B \Rightarrow$$

$$\frac{dB}{B} \geq -\varepsilon dt \Rightarrow$$

$$\int \frac{dB}{B} \geq -\int \varepsilon dt$$

$$\frac{dC}{dt} = \pi_1 - \alpha C - \beta C$$

it is true that

$$\frac{dC}{dt} \geq -(\alpha + \beta) C \Rightarrow$$

$$\frac{dC}{C} \geq -(\alpha + \beta) dt \Rightarrow$$

$$\int \frac{dC}{C} \geq -\int (\alpha + \beta) dt$$

Using the same technique and applying initial condition,

$$C(t) \geq C_0 e^{-(\alpha+\beta)t} \geq 0. \quad (8)$$

We consider the fourth equation which is

$$\frac{dD}{dt} = \delta A + \varepsilon B - \tau D - \sigma D \Rightarrow$$

$$\frac{dD}{dt} \geq -(\tau + \sigma) D \Rightarrow$$

$$\frac{dD}{D} \geq -(\tau + \sigma)\,\mathrm{dt} \Rightarrow$$

$$\int \frac{dD}{D} \geq -\int (\tau + \sigma)\,\mathrm{dt}$$

$$\therefore D(t) = D_0 e^{-(\tau+\sigma)t} \geq 0 \quad (9)$$

Lastly, we consider the fifth equation

$$\frac{dE}{dt} \geq -(\theta + \gamma) E \Rightarrow$$

$$\frac{dE}{E} \geq -(\theta + \gamma) dt \Rightarrow$$

$$\int \frac{dE}{E} \geq -\int (\theta + \gamma) dt \Rightarrow$$

Using separation of variable method together with the initial condition yields,

$$B(t) \geq B_0 e^{-\varepsilon t} \geq 0. \quad (7)$$

Similarly, considering (3), that is,

$$\frac{dE}{dt} = \pi_2 - \theta E - \gamma E + \tau D + \sigma D \Rightarrow$$

$$\therefore E(t) \geq E_0 e^{-(\theta+\gamma)t} \geq 0 \quad (10)$$

This completes the proof. Hence, the solutions of the model are positive

3.2. The Stability Analysis

Proposition 2. The model is stable if and only if $\lambda_i < 0, i = 1, 2, 3 \ldots, \lambda$ is an eigen value.

Proof. To prove the theorem, the Jacobian matrix of the system (1) – (5) is obtained as follows:

$$J = \begin{pmatrix} -\delta & 0 & \alpha & 0 & \gamma \\ 0 & -\varepsilon & \beta & 0 & \theta \\ 0 & 0 & -(\alpha+\beta) & 0 & 0 \\ \delta & \varepsilon & 0 & -(\tau+\sigma) & 0 \\ 0 & 0 & 0 & (\tau+\sigma) & -(\theta+\gamma) \end{pmatrix} \quad (11)$$

The characteristic equation of (11) is

$$-(\alpha+\beta+\lambda)\times \begin{vmatrix} -(\delta+\lambda) & 0 & 0 & \gamma \\ 0 & -(\varepsilon+\lambda) & 0 & \theta \\ \delta & \varepsilon & -(\tau+\sigma+\lambda) & 0 \\ 0 & 0 & (\tau+\sigma) & -(\theta+\gamma+\lambda) \end{vmatrix} = 0$$

$$-(\alpha+\beta+\lambda)\times \left[\begin{vmatrix} -(\varepsilon+\lambda) & 0 & \theta \\ \varepsilon & -(\tau+\sigma+\lambda) & 0 \\ 0 & (\tau+\sigma) & -(\theta+\gamma+\lambda) \end{vmatrix} - \gamma \begin{vmatrix} 0 & -(\varepsilon+\lambda) & 0 \\ \delta & \varepsilon & -(\tau+\sigma+\lambda) \\ 0 & 0 & (\tau+\sigma) \end{vmatrix} \right] = 0$$

$$-(\alpha+\beta+\lambda)$$
$$\begin{bmatrix} -(\delta+\lambda)\left\{-(\varepsilon+\lambda)\begin{vmatrix}-(\tau+\sigma+\lambda) & 0\\ (\tau+\sigma) & -(\theta+\gamma+\lambda)\end{vmatrix}+\theta\begin{vmatrix}\varepsilon & -(\tau+\sigma+\lambda)\\ 0 & (\tau+\sigma)\end{vmatrix}\right\} \\ -\gamma(\tau+\sigma)\begin{vmatrix}0 & -(\varepsilon+\lambda)\\ \delta & \varepsilon\end{vmatrix}\end{bmatrix}=0$$

which simplifies to

$$-(\alpha+\beta+\lambda)\times$$
$$\begin{bmatrix} -(\delta+\lambda)\begin{Bmatrix}-(\varepsilon+\lambda)(\tau+\sigma+\lambda)(\theta+\gamma+\lambda)\\ +\theta\varepsilon(\tau+\sigma)\end{Bmatrix} \\ -\gamma\delta(\tau+\sigma)(\varepsilon+\lambda)\end{bmatrix}=0,$$

expanded into

$$-(\alpha+\beta+\lambda)\times$$
$$\left[k_0\lambda^4+k_1\lambda^3+k_2\lambda^2+k_3\lambda+k_4\right]=0 \quad (12)$$

Where

$$k_0=1$$
$$k_1=\tau+\sigma+\theta+\gamma+\delta+\varepsilon$$
$$k_2=\delta(\tau+\sigma+\theta+\gamma+\varepsilon)+(\tau+\sigma)(\theta+\gamma)$$
$$+\varepsilon(\tau+\sigma+\theta+\gamma),$$
$$k_3=\delta\left[(\tau+\sigma)(\theta+\gamma)+\varepsilon(\tau+\sigma+\theta+\gamma)\right]$$
$$+\varepsilon(\tau+\sigma)(\theta+\gamma)-\theta\varepsilon(\tau+\sigma)-\gamma\delta(\tau+\sigma)$$

and,

$$k_4=\delta\varepsilon(\tau+\sigma)(\theta+\gamma)+\delta\theta\varepsilon(\tau+\sigma)-\gamma\delta\varepsilon(\tau+\sigma)$$

In (12),

$$\lambda_1=-(\alpha+\beta)$$

Following Routh-Hurtwitz stability criteria in [26], the remaining eigenvalues of (12) are all negative if

$k_1>0, k_3>0, k_4>0,$ and

$x>0$ *where* $x=k_1k_2k_3-(k_3^{\,2}+k_1^{\,2}k_4)$

$k_1>0$ is already satisfied. We shall employ simulation to examine the state of other conditions by using parameters values in Table 1. The values of τ and σ are varied while the values of other parameters are fixed to come about the results in Table2.

4. SIMULATION AND DISCUSSION

We shall conduct the simulation with the help of Maple software to conclude the theoretical results in section 3 for the stability of the party switching model. The parameters values stated in Table 1 are used as the initial values before varying some of them to come about the results in Table2

TABLE II. STABILITY RESULTS OF THE PARTY SWITCHING MODEL

S/NO	τ	σ	γ	δ	ε	θ	k_3	k_4	x	Remark
1	0.010	0.001	0.100	0.400	0.100	0.050	0.007	0.000	0.000	Unstable
2	0.020	0.002	0.100	0.400	0.100	0.050	0.008	0.000	0.001	Unstable
3	0.030	0.003	0.100	0.400	0.100	0.050	0.008	0.000	0.001	Unstable
4	0.040	0.004	0.100	0.400	0.100	0.050	0.009	0.000	0.001	Unstable
5	0.010	0.100	0.100	0.400	0.100	0.050	0.012	0.000	0.002	Unstable
6	0.020	0.200	0.100	0.400	0.100	0.050	0.021	0.001	0.004	Stable
7	0.030	0.300	0.100	0.400	0.100	0.050	0.029	0.001	0.007	Stable
8	0.040	0.400	0.100	0.400	0.100	0.050	0.037	0.002	0.013	Stable
9	0.050	0.500	0.100	0.400	0.100	0.050	0.045	0.002	0.020	Stable

The numerical results in Table II are complemented with *Fig. 2 – Fig. 4*. The parameters values in Table I are the initial values for the parameters to plot the curves while the initial values for the state variables are: *A(0)*=1, *B(0)*=1, *C(0)*=75 000, *D(0)*=5 000, *E(0)*=100 000 000

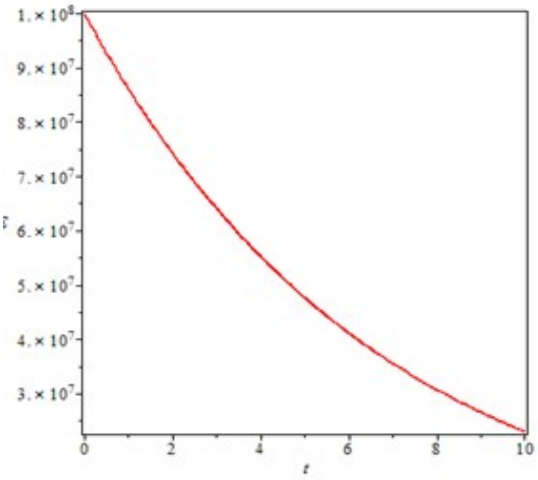

Figure 2: Plot of E(t). Parameters values remain as in table 1

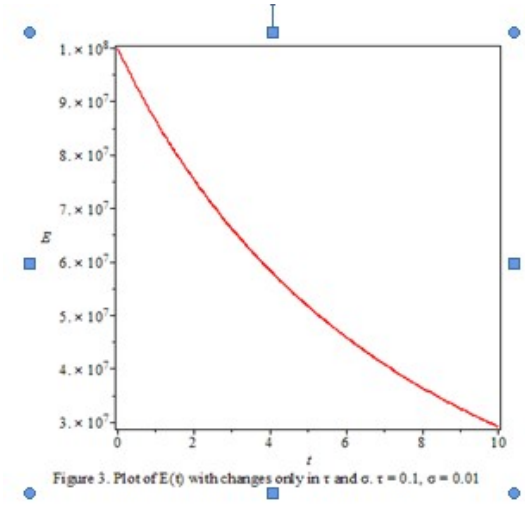

Figure 3. Plot of E(t) with changes only in τ and σ. τ = 0.1, σ = 0.01

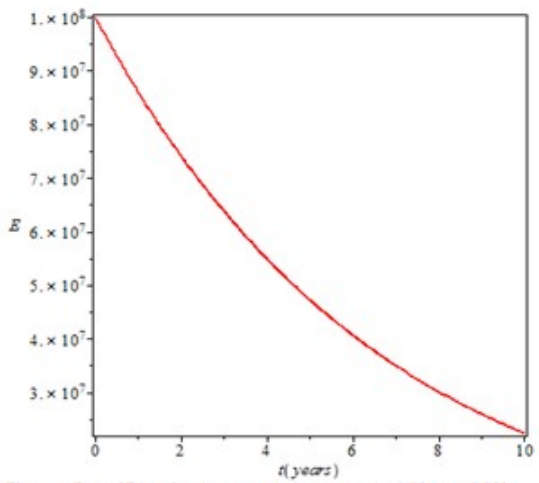

Figure 4. Plot of E(t) with changes only in τ and σ. τ = 0.001, σ =0.0001

The model is stable when political office holders deliver their electoral promises otherwise it is unstable. Based on the assumption on which the model is built, party *A* won more political offices than party *B* and the expectation of the electorates was higher from political office holders in party *A* than political office holders in party *B*. S/No 2 – S/No 4 in Table 2 show that when the dividends of democracy delivered by political office holders from party *A* are ten times that of political office holders from party *B*, the model is unstable because $k_4 = 0$. The implication of instability is that political office holders from party *A* have not done enough to meet their electoral promises which make the electorates lose confidence in them. On the other hand, when the dividends of democracy from the political office holders from party *B* are ten times that of political office holders from party *A*, the model is stable in a certain region (S/No 6– S/No 9 in Table 2). The implication of stability is that political office holders from party *A* fall behind their counterparts from party *B* in terms of performance which cost them their places in the hearts of the electorates who voted for them. Consequently, the electorates are looking up to party *B* in the future election and whoever contests on the platform of party *B* has 99 out of 100 chances of winning the election. The political calculus and permutation trigger defection and struggle for the tickets of party *B* against the future general election for politicians to avoid political death.

As regards *Fig. 2 – Fig. 4*, we place emphasis only on the electorate compartment *E(t)* because the electorates are at the receiving end of the electoral processes and democracy to them is all about its dividends. They are motivated to participate in election when they enjoy dividends of democracy. Based on that, we vary the values of the parameters that are related to the dividends of democracy from both parties which are τ and σ to predict the behaviour of the electorates, the results of which are illustrated in *Fig. 2 – Fig. 4*. *Fig.* 2 is obtained by using the parameters values in Table 1 together with the stated initial values for the variables under Table 2 while *Fig. 3* and *Fig. 4* are obtained in the same manner except changes to the parameter τ and σ. We compare *Fig. 3* and *Fig. 4* with *Fig. 2* to investigate the behaviour of the electorates to changes in the values of τ and σ. The numerical results for *E(t)* in *Fig. 2, Fig. 3* and *Fig 4* are 47 675 260, 51 702 250 and 47 280 437 respectively. The implication of these numerical results in relation to the figures is that even though the motivation of the electorates to participate in election declines with time as in the case in Nigeria today, their willingness to cast votes is better when the dividends of democracy from both parties are increased ten times (*Fig. 3, E(t)*= 51 702 250). Whereas, the electorates lose confidence in democracy and consider election a futile exercise when the dividends of democracy from both parties are reduced ten times (*Fig. 4*, *E(t)*= 47 280 437).

The outcome of the analysis reveals that true democracy has not been established in Nigeria. Defection is being used by the politicians to remain on the political stage even when they fail to deliver. Therefore, for Nigeria to practice a true multiparty democracy the judiciary should make it clear the bases for legal defection and the same judiciary through the law courts should make any politician who defects illegally vacates his office.

5. CONCLUSION

In this study, a mathematical model that described party switching phenomenon in Nigeria was designed. The solutions of the model were proved to be positive and the stability properties of the model were examined by using the stability theory of nonlinear differential equations. Simulation was conducted to establish the stable and unstable regions in the model where politicians were bent to switch political parties in order to avoid political suicide. To ensure political stability and discourage incessant party switching, the societal disposition which places emphasis on the political parties at the expense of the integrity of the party candidates should be addressed to safe Nigerians from precarious mindset. Voting into public offices should be based on the integrity of the candidates and not on the political parties. Switching from one political party to another will not make any difference if the attention of the electorates is not on the political parties but on the integrity of the candidates. However, while the study had provided

excellent framework for the analysis of party defection in Nigeria, its reality is limited by the hypothetical values adopted for the parameters to conduct the simulation. Future study can be directed towards a more realistic result when there is availability of true values for the parameters.

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