

## Sudan 2015 General Election: Speculation on the Number of Seats Won by the National Congress Party and Other Parties Based on a Theoretic Game Model

**Ahmed Elsheikh M. Ahmed**

Associate Professor  
Faculty of Economic and Social Studies  
Khartoum University  
Sudan

**Leena A. Elsheikh**

Lecturer  
Garden City University  
Sudan

### Abstract

*The primary intent of this paper is two-fold: in part to give a general description of the salient features of the Sudan 2015 general election confined only to the Member of Parliament for the 426 electoral constituencies. Moreover, in view of the complete absence of public opinion polling in Sudan, where no agency specializes in such a practice due to its prohibitive cost, an attempt is made to formulate strategic theoretic game model that helps predict the number of seats won by the incumbent National Congress (NC) party and other minor parties as a group. Two approaches are attempted to speculate on the number of seats won by the NC party and other parties namely: a pure strategy and a mixed strategy both following variant procedures. To ease identification of the strategy that should be pursued by the NC party to maintain reasonable majority and at the same time to open avenues of participation for small parties given its declared election policy which inculcates participation, the statistical concepts of expected value is used. To enrich analysis and lucid discussion, the speculated results of the theoretic game model are compared with the realized results as officially announced by the National Elections Commission (NEC). Based on the model results, the paper recommends: given the prevailing national, regional and international circumstance and the interactive nature of the political process, all parties should communicate, cooperate and stop brawling among each other to prohibit any looming threat that leads to a disintegrating state similar to some neighboring Arab countries and further to seek a safe route that strikes a balanced political power, currently tilted in favor of the NC party rendering it the most dominant. This helps facilitating the merit of diversity rather than imposing a narrow set of political values that do not conform to everyone.*

**Keywords:** Election, parties, game theory, strategy optimal solution

### (1) General Background

The 2015 election in Sudan was held on 13, 14 and 15 of April, to elect the president, state legislative council and national legislative council. A new constitution adopted in 1998 and revised in 2000 recognized political parties for the first time since the military coup of 1989. This is the fourth election after the recognition of political parties and the first after the South Sudan secession. 24 parties in all took part in the election out of 77 registered parties according to 2009 parties registration by-law amended 2012. The remaining parties choose to boycott the election for specific reasons. The parties running for election – with exception of the national congress (NC) party and the Democratic Unionist (DUP) – could be described as poor mass – based organizations. Some of the them have ethno-regional support base, other are basically split of the major traditional parties in Sudan – splinter disagreeing hostile groups. The 2015 election was supervised by the National Election Commission (NEC). It is an autonomous (both politically and fiscally) public commission responsible for conducting elections for all elective public offices in accordance with the National Election Act of 2008, amended 2011 and 2014, [see NEC2014].

Sudan is a federal constitutional republic characterized by multi-governing system: federal or central, state and local. For the purposes of this paper, the focus is only on the federal level. According to article (29 – 12 ) of the National Act referred to above , Sudan electorate process adopts a hybrid voting system comprising both "first - past - the - vote" and proportional representation. The proportional representation voting system consists of party list and woman list each accounting for 20% and 30% of the 426 total numbers of seats forming the national council (Parliament). See table (1) below

**Table (1): Distribution of Seats According to Voting Type**

Voting type	Categories	Percentage of Voting type	Number of seats
	National Geographic constituencies	50%	213
Proportional Representation	Women-List	30%	128
Proportional Representation	Party List	20%	85
<b>Total</b>		100%	426

Source: Compiled by authors.

Referring to article (34) of the National Election Act, the number of geographical constituencies and its required average number of persons are determined by a three –steps procedure:

**Step (1):**

$$\text{National divisor} = \frac{\text{Sudan population size}}{213}$$

**Step (2):**

$$\text{Number of geographic constituencies for each state} = \frac{\text{population size for each state}}{\text{National divisor}}$$

**Step (3):**

$$\text{Election divisor} = \frac{\text{population size for each state}}{\text{Number of seats for each state}}$$

Hence, the election divisor gives the average number of persons required for each constituency – see table (2) below:

**Table (2): Distributions of seats among states and percentage of seats won by NC party**

State	Number of seats	Seats won by NC party	Percentage of seats won by NC party	State	Number of seats	Seats won by NC party	Percentage of seats won by NC party
Red sea	10	7	70	Sennar	9	6	67
Gezira	25	17	68	East Darfur	7	5	71
Khartoum	36	26	72	North Darfur	14	10	71
Northern	5	3	60	North Kordofan	14	11	79
Ghedaref	9	6	67	West Darfur	5	4	80
White Nile	12	8	67	West Kordofan	9	6	67
Blue Nile	6	4	67	Kassala	12	8	67
Southern Darfur	21	15	71	River Nile	8	5	63
Southern Kordofan	7	5	71	Central Darfur	4	3	75

Source: compiled by authors.

### (1.1) Party Campaign and Platforms

Organization of the political campaigns and its official period is stated clearly in seven articles (64 - 70) of the National Election Act.

The campaign period should not exceed 50 days and not be less than 30 days. It should last one day before the Election Day. The length of the campaign is strictly specified by law. However, an effort exerted by parties to persuade more voters to their side is determined as well by the degree of intensity laid and geographical concentration. Campaign efforts should spread over both urban and rural communities – not to be focused on one community at the expense of the other. With exception of a few, parties do not held their annual conferences for quite a time. Reading through their written and announced political programs one can easily notice that most of the programs had evolved with an extremely blurred focus. They all promise promotion of national unity, transparent governance, finding remedies for economic mismanagement and improving the standard of living, among others. Despite the fact that the election was held in an atmosphere of increasing tension, limited intimidating incidents precede the Election Day. They are mainly confined in distributing pamphlets calling for the boycott of the election, and in part designed to elicit antagonistic reaction against the national congress (NC) party. Apart from that, and contrary to what was expected, the campaign period and the Election Day proceeded fairly smooth, no casualties or physical damage was reported.

### (1.2) Election Results

Voting took place as scheduled in 13, 14 and 15<sup>th</sup> of April despite the demand of the majority of the opposition parties to be postponed until a negotiated settlement is reached through the national dialogue called upon by the president in January 2014. Balloting had been delayed in some parts of the country either due to instability caused by the civil war or due to some logistical problems. These latter problems were confined to delays in transporting of ballot boxes and lag delivery of voter registers to polling stations (e.g. Gezira state). A part from that voting took place with no obvious security problems. The following table (3) shows the total percentage participation and the final official figures relating to some organizational aspects.

**Table (3): The Total Percentage Participation**

Item	Numbers
Registered	13,126,989
Polling stations	6,911
Polling committees	10,942
Voters	6,091,412
Participation	46.4%
Correct voting	5,584,863

Source: NEC report.

Despite the fact that the participation rate is below 50%, still it compares fairly to some established democracies like USA and some other European countries. However, this reduced participation rate in established democracies is due to factors of different nature.

Table (4) below is obtained on the basis of Vanhanen three

Indices: political participation (PP) which is already indicated in table (3) above labeled participation percentage, political competition (PC) and political democratization (PD)

**Table (4): Vanhanen three Indices**

PP	PC	PD
0.464	0.242	0.1123

Source: Calculated by authors.

Computationally, the three indices are related. They reveal that the last two characteristics, political competition and democratization are 24.2% and 11.23% respectively. The two characteristics are poor. This is primarily attributable to the fact that only 24 parties out of total of 77 registered parties run for election as mentioned above. To stimulate both competitiveness and the process of democratization, a dialogue that leads to compromises and concessions by the NC party is crucial. The following table (4) shows the states distribution of the popular vote and details the participation rate of the (18) states comprising Sudan, in a descending order. It offers some revealing glimpses into the degree of competitiveness among states as well.

**Table (5): Participation Rates of the States Comprising Sudan**

State	Participation Rate	State	Participation Rate
Kassala	66.01	White Nile	45.68
Northern	58.46	East Darfur	45.57
River Nile	57.50	South Kordofan	45.25
Gezira	52.20	West Darfur	43.46
North Darfur	50.61	Ghedaref	41.18
North Kordofan	49.33	South Darfur	40.72
Sennar	49.15	West Kordofan	38
Red Sea	48.33	Blue Nile	37.26
Central Darfur	47.51	Khartoum	34.48

**Source: NEC reports.**

The striking feature of table (5) is that Khartoum state the centre of political power and the magnet for just about every political ideology extant, is relegated to inferior position – at the bottom of the table. It is the least competitive state. Could the increased urbanization attributed to increased internal immigration accentuated by greater mobility, be held as an explanation. Furthermore, the participation rate of only five states exceed 50%, reflects relatively competitive voting compared with the remaining thirteen states, whose participation rates range between 34% to 49%. This conspicuous and egregious indifference on the part of voters could be explained by different reasons. Apart from those who are boycotting elections due to solid political convictions? The explanation ranges from apathy and boredom to failure and incapability of the existing political parties to deliver, both at the national and international levels. In addition, their divisive, disruptive nature led to complete political stagnation. This is why voters' motivation dwindles. Such apathy and lack of motivation on the part of voters could precipitate serious consequences which might have adverse effects on the overall political performance of the country currently and in the future. It is rather difficult to tell whether the political parties and other aspirants for power, are aware of the looming threats caused by such horrifying political participation disinterest. Do political parties ask why the majority of eligible voters stand aloof, distancing themselves from taking any active part. In spite of the shared political objectives of the various elements comprising those political parties, individual egos, personal idiosyncrasies, tribal vying, and ideological differences all combined to propagate disastrous factionalism within those parties. Being involved in mutual interpersonal and intertribal antagonism far beyond political concerns. Most inexperienced political leaders have no clear-cut, coherent political visions or strictly and carefully orchestrated political programs or even a sharply defined glimpse into how to approach the unmotivated grass – root voters and find out what sort of reforms they are aspiring for. An approach that appeals to reason and common sense as voters are not blind followers, their insight and intelligence should be respected. The political election is guided by the voters' sentiment. In particular, does the NC party, the majority, is willing and able to initiate an internal structural political reform synchronized with international openness to prove its seriousness about the national dialogue called upon by the president in January 2014.

This is possible if the NC party appreciates the political realities surrounding the country and try to be responsive to them, even the most hidebound parties can change over time pressed by a highly charged political atmosphere. At the other end of the spectrum, the minority parties are also to blame for their unwillingness to participate in helping to free the political process from this stalemate. One wonders, whether this lack of participation is due to their inabilities to comprehend what is prevailing around the region, or are they waiting to take advantages of the political and economic pressures exerted by the West, especially USA to take the upper hand in any looming negotiated settlement. It is high time for local politicians to understand that the balloting rights initiated by genuine democratization process, become a must consequential upon the collapse Soviet Union and the supremacy and superiority of civil rights over the principle of national sovereignty. The National Congress party was expected by many observers to be the majority party. However, it is rather difficult to speculate on the number of seats that will be won by it, which in itself a useful piece of information. Nevertheless, speculation should be based on plausible assumptions, not just mere guess work. Such speculation form a solid basis for the choice of future strategies pursued by both minor and major parties in the political arena as alluded to above. One intention of this paper is formulate a theoretic game model to ease speculation.

To detect the ethno regional voting pattern one can obtain the average participation rate of the five regions comprising the country, namely: Northern, Eastern, Western, Central and Khartoum state as a melting – pot of no definite ethnic identity. The following table (6) is derived from table (4) for this purpose.

**Table (6): Regional Distribution of the Participation Rate**

Region	Average participation rate (Percentage )
Northern	57.98
Eastern	51.84
Western	50.06
Central	46.07
Khartoum State	34.48

**Source: Compiled by the authors.**

Three of the five regions, their participation rates exceed 50% which reflects the relative intensity of competition in those regions compared with the central region and Khartoum state. This could be explained by the fact that those peripheral regions: Northern ,Western and Eastern lack basic services and striving hard through their ethno regional political parties to acquire a substantial share in power to advance their cause in an attempt to secure more basic services. The two other regions (Central and Khartoum state) which are both densely populated with somewhat fair base of services, seems the less competitive. Unfortunately, there are no readily available compiled tables showing the total number of votes for each party running for election for each of the five regions. Such a table will enable analysts to obtain correlation between the region and party support, in addition to the relative performance of those parties among regions or states. Such exercise can be undertaken by the competent staff of the NEC to facilitate things for researchers. The following table (7) shows the official results of parliamentary elections as declared by the NEC. The NC party as expected won the majority of seats, other parties are lagging far behind. The percentage of seats won by NC party ranges between 60% - 80%, see table (2). This poor performance of the minor parties is suggestive to an overwhelming political inadequacy. It is an alarming call for these parties to enrich and engage themselves politically, otherwise, they will remain passive and submissive and through time they would be weeded out of the Sudan political arena.

**Table (7): Results of the National Council (Parliament) Election**

Party	Number of Seats			Total
	Geographic Constituencies	Proportional Representation		
		Woman List	Party List	
National Congress	149	107	67	323
Democratic Union (Asal)	16	6	4	26
Liberation and Justice	1	1	1	3
National Ummah	2	-	1	3
United Ummah	1	2	1	4
Federal Ummah	3	3	1	7
Reformand Development Ummah	3	1	1	5
Democratic Union	10	3	2	15
National Solidarity	-	1	1	2
Collective Leadership Ummah	2	-	4	6
Federal Truth	-	1	1	2
National Liberation and Justice	3	-	1	4
Popular Forces Movement for Rights and Democracy	-	1	-	1
National Reform	-	1	-	1
Constitution (Dastur)	-	1	-	1
East's Justice & Development	1	-	-	1
Free Lions	1	-	-	1
Sudan Anna	1	-	-	1
General Union of South and North Fung	1	-	-	1
Popular Movment	1	-	-	1
Independent Candidates	18	-	-	18
Total	213	128	85	426

**Source: compiled by authors from NEC published reports.**

Eventually, insofar as the validity and recognition of the results by regional and international agencies are concerned, regional observers unvaryingly concluded that the election was conducted in a free and fair atmosphere. The victory of the NC party is for sure not through cunning and guile but it is due to specific factors, among them, is the boycott of some major parties. However, the United States of America and the European Union were skeptical. The source of their skepticism was not crystal clear as to whether they discover irregularities or flagrant violations of the electoral law. It does not stand to reason. No evidence is provided to substantiate their doubts. However, it seems that the recognition of the election transparency is a de-facto recognition of the coming newly formed government which was already viewed by the USA government and European Union as a continuation of past governments which are accused of violating human rights and supporting terrorism. Notwithstanding, lack of recognition might not impede Sudan government to go about its business, but for positive interaction with USA and European Union whom they have the upper hand over international matters it is quite prudent if Sudan government exerts concerted efforts in reforming the internal political and economic set – up. Otherwise, world faith in government institutions will continue to shatter and the whole country will be subjected to deterioration into a political vacuum and civil discontent that will reach into every corner of it.

## **(2) Rationale and Objectives**

Public opinion polling is a wide spread practice in almost all advanced countries. There are a host of agencies specialized in this area in USA, Europe and some Asian countries <sup>1</sup>. Public opinion polls address a variety of topics including political general election. Two activities are undertaken: collection and analysis of data. Data collection methods are quite sophisticated. They are either automated survey process or traditional methods relying on phone banks, boiler rooms and operator - assisted technology. The emerged raw data is processed through a weighting program to cater for certain factors (age, gender etc...) in order to guard against prediction errors. For political surveys, questionnaire questions include the following aspects of elections – voting history, interest in the current political campaign and likely voting intentions. Public opinion polls could be quite reliable if they are representative of the wider targeted population (e.g. eligible voters) and supplemented with a carefully designed dynamic weighting system. Further, precision of prediction could be increased by embodying a survey design effect to adjust the likely error margins. This practice of public opinion polling whether for election or otherwise is entirely lacking in Sudan due to its prohibitive cost. No affordable in two accounts – lack of funding and absence of required expertise. This is fundamental reason why this paper attempts to explore the possibility of using a game theoretic model as an alternative speculative tool. Hence, the paper underlies the urgency of developing such a model to bring much clarity to our understanding of strategic principles involved in the political process and to illustrate its power as an aid to thinking. It is not conceivable, at least for the time being, for a developing country like Sudan and similar other countries to speculate on the outcomes of a political election based on opinion polling as it is excessively expensive. Nevertheless, the issue is too important to be neglected. Consequently, one believes that game theoretic model could be possible cheap alternative speculative tool, helps in devising experimental indicators as a guide for the analysis of the election results in certain respects. In light of this rationale, the primary objective of the paper is a formulation of strategic theoretic game model to predict the number of seats that will be won by the majority National Congress (NC) party. Based on the model results, the expected number of seats that will be won by the NC party will be computed for each strategy adopted by the group of other parties in order to identify which one correspond to maximum expected value.

## **(3) Hypothesis and Objectives**

In spite of the fact that the Sudan 2015 general election was held in an atmosphere of increasing tension, it was largely expected that the NCP will win a majority given the prevailing political realities. However, the majority varies along wide latitude extending between (214 - 426) where the total numbers of parliamentary seats are (426). To ease matters, this extended range has been classified into four distinct attributes, namely: poor, moderate, good and very good. In the complete absence of an associated public opinion polling speculating about the likely election outcome, the study hypothesizes that the CNP will win a good majority provided that it adopts strategy of full cooperation with other parties running for election.

---

<sup>1</sup> for example, the famous agencies in USA are Gallup, Rasmussen Report, Harris Roper among other, while in UK are You Gov, Survation , Opinium, Lord Aschroft, Tws and ComRes beside others

#### (4) *The Methodology*

As alluded to above, the study is primarily empirical based on a theoretic game model. To elicit a conditional optimal solution for the model as speculative tool, two approaches with variant procedures are experimented with:

- A pure strategy game in which the political parties under study select a single strategy from a feasible set of strategies.
- A mixed strategy in which the political parties under study choose probability mixes of strategies.
- Furthermore, the concept of expected value will be used to identify the strategy pursued by the other parties as a group that will guarantee a reasonable majority for the NC party.

#### (5) *The Theoretic Game Model*

To specify the model and ease an equilibrium solution, the total numbers of parties running for the 2015 general election are categorized into two main groups to represent two competing entities only. The categorization of this multi-competitor setting as if they involve two entities facilitates analysis as well. The two entities are:

Group (A): Signify the National Congress Party (NCP) as an entity on it is own.

Group (B): Signify the remaining parties running for election as a second entity.

Given this classification, the NCP needs only to anticipate the average decisions of other parties (group B) to determine its own best reaction.

The model is based on the following realistic assumptions:

- (i) The NCP will win the election by a majority. Having assumed that, the challenge is by how much seats? This is what the model will attempt to predict.
- (ii) Parties running for election are rational, in the sense that each will strive hard to maximize the number of seats hoping to win within its category given the prevailing political circumstances.

The question posed here, are the two assumptions justifiable? To a considerable extent, the answer is yes. Assumption (i) can be viewed as ad hoc but still conform with the existing political realities of the Sudan for cogent reasons:

- Some influential rival parties are boycotting the general election (e.g. Umma Party, Popular Congress Party (PCP) etc.)
- The National Congress Party is a well-funded and better organized compared with its disintegrated rivals .
- The National Congress Party is entirely backed and fully supported by the organized forces (military, police etc.) which according to the existing election law have the right to vote.

On the other hand, the rationality assumption is used to facilitate analysis despite the fact that the parties (players) suffer from what is labeled “bounded rationality” due to the intricate character of the political process.

To formulate the theoretic game model, a set of feasible strategies will be adopted by each group:

- (i) The National Congress Party (group A) strategies denoted  $[C_i, i = 1, 2]$  are:

$C_1$  : Cooperating fully with other parties (group B) by pledging not to compete in certain constituencies to expand political participation. This strategy features limited common interest to some extent.

$C_2$  : Not cooperating with other parties to secure a grandiose majority. Thus the strategy features pure conflict.

- (ii) The other parties (group B) strategies denoted  $[D_i, i = 1, 2, 3, 4]$

$D_1$  : Fully cooperating with the (NCP) in order to expand political participation.

$D_2$  : Modest cooperation with the (NCP).

$D_3$  : Poor cooperation with the (NCP).

$D_4$  : No cooperation with the (NCP)

Consequential upon that, the NCP (group A) will adopt two possible strategies while the other parties (group B) will adopt four possible strategies. Hence, the dimensions of the pay-offs table is 2 x 4 (i.e. two rows and four columns).

**(5.1) The Pay-offs Table**

The pay-off is a basic parameter in such interactive strategic decision situation that involves a number of competing rivals. The nature of the general election dictates a constant-sum model as the total number of constituencies is 426 i.e. the residue of what the (NCP) wins from the total represents what the other parties (group B) will win. In other words, the sum of pay-offs to the entity making the decision [in our case group (A) and group (B)] is constant. To elaborate more, the sum of the pay-off for each cell is the total number of constituencies 426. The entries for each cell in the pay-offs table will be chosen from a range according to specified assumptions as we shall see later. In order to form the ranges, the majority and minority will be classified into four attributes: poor, moderate, good and very good denoted  $A_i$  ( $i = 1, 2$ ) for the majority and  $B_i$  ( $i = 1, 2, 3, 4$ ) for the minority. The lower end point for the “poor” majority range is assumed to be 214 (half the total seats plus one) while the upper end point of the range representing the “very good” majority range is 426 (all seats). The difference between the upper point “very good” majority range and lower end point of the “poor” majority range divided by the total number of ranges which is four gives a uniform length for each range. A similar procedure is used to classify the minority attributes. The lower end point of the “poor” minority range is zero (other parties, group (B), win nothing) while the upper end point of the range representing the “very good” minority is 212 (half of the seats less one). The difference divided by four gives, also, uniform length for the minority ranges. This suggests the following illustrative table:

**Table (8): The Suggested Ranges for the Majority and Minority**

Majority				Minority			
$A_i (i = 1, 2, 3, 4)$				$B_i (i = 1, 2, 3, 4)$			
Ranges	Attributes	Symbols	Mid range	Ranges	Attributes	Symbols	Mid range
214-267	Poor	$A_1$	241	0-53	Poor	$B_1$	27
268-321	Moderate	$A_2$	295	54-106	Moderate	$B_2$	81
322-375	Good	$A_3$	349	107-159	Good	$B_3$	135
376-426	Very good	$A_4$	401	160-212	Very good	$B_4$	187

Source: Constructed by the authors.

It is worth noting a fundamental feature of the above table (8). Summing the upper end points of the majority ranges from bottom to top with lower end points of the minority ranges from top to bottom gives the total number of seats (426). This is dictated by the nature of the model which is a constant sum game. However, this is true only for one sum, the other three sums are equal to 426 due to the rounding errors dictated by the fact that both the majority and minority ranges are mutually exclusive and collectively exhaustive in view of the discrete nature of the seats numbers. This will not affect the solution which is based on the mid- ranges of the majority and minority classes.

**Table (9): Pay-offs table for the 2015 General Election in Sudan**

			Other Parties (Group B)			
			Fully Cooperating with (NCP)	Modest Cooperation with (NCP)	Poor Cooperation with (NCP)	No Cooperation with (NCP)
			$(D_1)$	$(D_2)$	$(D_3)$	$(D_4)$
National Congress Party group (A)	Fully Cooperating with other Parties	$(C_1)$	(241, 185)	(295, 131)	(349, 77)	(401, 25)
	Not Cooperating with other parties	$(C_2)$	(421, 5)	(394, 32)	(345, 81)	(276, 150)

Source: Constructed by the authors.



The pay-offs table contains 8 cells; each cell consists of two entries. According to the game theory conventions standard format, in each cell, the left number represents rows, the number of seats the (NCP-group A) wins, the right number represents columns the number of seats other parties (group B) wins. To predict the number of seats each group wins, the attributes are translated into numbers to ease computations. There is no hard and fast rule to apply in order to translate the attributes (poor, moderate, good and very good) into numbers herein lays the central challenge. Hence, specific assumptions based on the Sudan political settings are imperative. Two assumptions are made to obtain educated guess for the pay- offs of each group (A and B) corresponding to the specific strategy adopted.

#### **Assumption (i)**

In case the NC party adopts the strategy full cooperation [ $c_1$ ], its entries in each cell are the mid – ranges of the majority classes in the order 241, 295, 349 and 401 from left to right. This is justified by the fact that the announced policy of the NC party is that it is willing to sacrifice more seats as long as other parties show more cooperation. For reassuring other parties and in view of its strong electorate position, it was already relinquished (20) seats to motivates other parties for cooperation. Hence, assuming a decreasing number of seats as pay offs for the NC party in consonance with the degree of cooperation strength seem plausible. On the other hand, the payoffs of the other parties for strategy [ $c_1$ ] are obtained as residuals to secure a constant sum game. As one notes, the pay offs are based on mid – ranges as a measure of central tendency to serve as a reference point. That is to say, the mid – range is used as a gravitational force that holds the number of seats within each range together near this reference point.

#### **Assumptions (ii)**

In case the NC party adopts the strategy of no cooperation [ $c_2$ ] renegeing its announced policy, something that quite possible in politics for some compelling circumstances. A party when facing pressure could be quite evasive. Under such a situation, the other parties are the one whom they have to ponder about the pursued strategies. This uncooperative attitude would be interpreted by them that the NC party is seeking grandiose, land sliding majority. This negative attitude on the part of the NC party may become a text to reinforce political bonds and solidarity among the other parties. Such solidarity might drives them to seek winning more seats as long as they are reciprocating and become more antagonistic and uncooperative with the NC party. Hence, the more they are unwilling to cooperate, the more intensive political campaign to launch to secure more seats. However, due to the heterogeneous nature of the parties constituting this group, they are rather politically weak. Their support base is fragile, basically of regional, ethnic nature, might be with the exception of the Union Democratic Party. Thus, it is doubtful that, as a group, they win number of seats equal to the mid – ranges of the minority classes escalating with their degree of uncooperativeness with the NC party. Accordingly, it seems plausible to assume that the entries (pay offs) of the other parties [group (B)] when the NC party adopts strategy [ $c_2$ ] are the mid – ranges of the minority classes scaled down by the factors: 0.2, 0.4, 0.6 and 0.8 respectively from left to right in the second row of the pay offs table (8). Entries of the NC party are the residuals analogous to the calculations of the first row [strategy  $c_1$ ]. The scaling figures can be viewed as a weighting factor, not only to guard against errors arising from unconsidered aspects but also as conformity factor to comply with political realities.

#### **(5.2) Solution of the Constructed Theoretic Game Model**

The game set in Table (8) reflects contestability in which the interests of the two groups (A and B) of the political parties running for election are directly opposed. The essential insight, here, is that since the entries constituting the eight cells of the pay-offs are viewed as number of seats that might be won if each group adopts a single strategy or a mixture of strategies, these seats can be interpreted as utility numbers each group is seeking to maximize within its specified majority or minority context.

To solve the model, two approaches are attempted:

- A pure strategy where each group (A and B) is restricted to choose a single strategy.
- A mixed strategy game where each group (A and B) chooses probability mixes of strategies.

Unfortunately, the pure strategy game approach fails to produce a solution using its variant procedures, namely: strict or weak dominance, iterated dominance and Nash equilibrium. Hence, the focus is laid on the mixed strategy solution.

Thus, following this approach, we assumed that the (NCP – group A) and the other parties (group B) chose mixed strategies  $(C_i; i = 1, 2)$  and  $(D_i; i = 1, 2, 3, 4)$  respectively – see table (8). The probabilities of the (NCP) playing strategies are denoted  $p$ :  $p_1, p_2$  and the probabilities of the other parties playing strategies are  $q$ :  $q_1, q_2, q_3, q_4$ . As the dimension of the pay-offs is  $2 \times 4$ , it is rather easier to determine the solution by using a linear programming approach. For a given values of  $p_i (i = 1, 2)$  the expected pay offs (number of seats) to the NCP will vary depending on the other parties (group B) choice of pure strategy  $[D_i; i = 1, 2, 3, 4]$ . Further, we assumed that the NCP (group A) will pursue “a maxi-min” strategy. Under such circumstance, the objective of the NCP is to choose the probability values of  $P_1$  and  $P_2$  so as to maximize the minimum of the possible expected seats that might be won . The solution to this problem will determine the optimal mixed strategy of the NCP.

To determine this optimal mixed strategy, the problem can be formulated as follows:

$$\begin{aligned} &\text{Maximize } F_c \\ &\text{Subject to:} \\ &241 P_1 + 421 P_2 \geq F_c \\ &295 P_1 + 394 P_2 \geq F_c \\ &349 P_1 + 345 P_2 \geq F_c \\ &401 P_1 + 276 P_2 \geq F_c \end{aligned}$$

Where:

- $F_c$  Denotes “a floor number of seats” below the minimum of these expected pay offs (number of seats).
- $P_1, P_2 \geq 0$  and  $P_1 + P_2 = 1$ .
- The left sides of the floor inequalities represent the expected seats that the (NCP) gets from each strategy  $D_i (i = 1, 2, 3, 4)$  initiated by other parties.

Using the fact that  $P_2 = 1 - P_1$ , the set of inequalities can be expressed by switching the two sides of the inequalities as follows:

$$\begin{aligned} F_c &\leq 421 - 180 P_1 \\ F_c &\leq 394 - 99 P_1 \\ F_c &\leq 345 + 4 P_1 \\ F_c &\leq 276 + 125 P_1 \end{aligned}$$

The feasible set is sketched in the Figure (see appendix). The solution is the point of intersection between the two constraints:  $421 - 180 P_1$  and  $276 + 125 P_1$ . This gives  $P_1 = 0.48$ . Hence, the NCP optimal mixed strategy is that:  $P_1 = 0.48, P_2 = 0.52$  and  $F_c = 335$ . That is to say, according to the formulated model, the optimal number of seats that might be won by the NCP approximately 335 seats. In view of the fact that the model is a constant sum game, the expected pay-offs to the two groups A and B sum to 426. Hence, the expected number of seats that might be won by other parties (group B) can be obtained as a residue, namely 91 seats. Given the probability values of  $P_1$  and  $P_2$ , one can compute the expected number of seats that will be won by the NC party for each strategy adopted by other parties  $[d_1, d_2, d_3$  and  $d_4]$ . The highest expected value indicates the strategy of group (B) that enables the NC party to achieve the maximum number of seats. As shown in table (10) , this occurs when other parties pursue a poor cooperation with the NC party.

**Table (10): Expected Number of Seats won by the NC party**

Strategies of group (A)	Probability	Strategies of group (B)							
		D <sub>1</sub>		D <sub>2</sub>		D <sub>3</sub>		D <sub>4</sub>	
		Pay off (2)	X (2) (3)	Pay off (4)	(1)X(4) (5)	Pay off (6)	(1)X(6) (7)	Pay off (8)	(1)X(8) (9)
C <sub>1</sub>	0.48	241	115.68	295	141.60	349	167.52	401	192.42
C <sub>2</sub>	0.52	421	218.92	394	204.88	345	179.40	276	143.52
<b>Expected Number of Seats</b>		334.60		-	346.48	-	346.92	-	335.94

Source: Computed by the authors.

In the light of the results shown in table (9), it is apparently far better for the NC party not to seek full cooperation with other parties, as this adversely affect its electorate performance. Still, however, for the NC party to secure active participation and to promote national unity, it adopts a rather conciliatory approach by sacrificing some seats acknowledging the fact that its majority is well guaranteed.

### **(6) Comparison between the Predicted and Realized Results**

Comparing the result obtained on the basis of the strategic theoretic game model with the actual result announced officially by the body responsible for general election in Sudan (the National Elections Commission NEC), one can observe a percentage discrepancy with reasonable magnitude, see Table (11) below:

**Table (11): Comparison between the Results of the Theoretic Game Model and National Elections Commission (NEC)**

<b>Results Group</b>	<b>NEC Result</b>	<b>Model Result</b>	<b>Percentage Discrepancy</b>
<b>National Congress Party [Group (A)]</b>	323 (75.8%)	335(78.6%)	+2.8%
<b>Other Parties [Group (B)]</b>	103 (24.2%)	91 (21.4%)	-2.8%

Source: Computed by authors.

The salient feature of table (11) is that the constructed theoretic game model overestimates the number of seats won by the (NCP) by 2.8% while it underestimates the seats won by the remaining parties by 2.8%. Comparing between the predicted and realized outcomes as shown in table (11), is it possible to justify the discrepancy between the predicted and realized figures? It is possible, by acknowledging the fact that the NC party has relinquished 20 constituencies for other party in the hope of persuading them to participate more in the election process. Another justification is that some NC party candidates defy the party institution decision and run for election as independents and some had won. In consonance with the majority assumption which is substantiated by both the predicted and realized outcome of the general election, the ruling (NCP) swept the seats of the National Council (NC). However, the question that should be addressed – which is of crucial importance for future political development – for how long the NCP will dominate the political scene to justify the majority assumption underlying the construction of the theoretic game model. In view of the dynamic nature of the political process, it is our contention that the majority assumption will not hold sway for long due to the following reasons:

- Open comprehensive dialogue with the parties boycotting the election might encourage their future participation jeopardizing the majority of the (NCP).
- The NCP, like other parties, is prone to future disintegration e.g. the disobedient that defy the party institution decisions and run elections on their own as appeared in the 2015 election. In addition some prominent leaders defect to form their own parties.
- To get international or regional recognition, the electoral process should maintain terms of integrity and competitiveness credibility, thus encouraging increased political participation, thus affecting the current position of NCP.
- The NCP held power for a long period of time; this might intensify popular resentment against it precipitating reduction in its membership. The decay of power overtime is inevitable.
- A sense of fear and threat permeates every aspect of life due to the prolong conflicts in Darfur, Southern Kordofan and the Blue Nile States. The hazard and perils associated with such conflict might have both short-run and long-run adverse effects on the coherence of the NCP.
- In view of increased political openness, absolute majority are globally in the wane.
- Ethno regionalism permeates the grass roots of the NC party, this would intensify hostility and scorn among its members which might eventually debilitate the party by distorting the choices of candidates.

### **(7) Concluding Remarks and Recommendations**

Given the prevailing political situation in Sudan, a constant sum game theoretic model is formulated by using a 2 x 4 pay-offs table to predict the likelihood outcome of the 2015 general election.

Specifically, the number of seats that might be won by the NCP as an entity of its own (denoted group A) besides the number of seats that might be won by other parties lumped together as a separate entity (labeled group B). Due to the interdependent nature of the general election where choices of actions of each group have consequences for the other group, a feasible set of strategies with nonzero probability of occurrences have been adopted by each group. A pure strategy approach was not found plausible which necessitates the use of a mixed strategy approach. This led to a more tractable linear programming solution that maximizes the minimum of the expected number of seats won by each group (i.e. maxi-min solution). The obtained solution assigns approximately 335 seats to the NCP and 91 seats to the remaining parties run for election. It is worth mentioning that the emphasis on this endeavor is to examine the operational nature and practicability of the game model as a plausible speculative tool under specific assumptions. As evidenced above, the major finding of the study is that even limited cooperation between the NCP and some other parties – as shown by the expected number of seats won by the NC party, see table (9) – could lead to a good majority for the NCP and moderate minority for the remaining parties according to our specification for what defines “moderate” and “good” in this study. This limited cooperation, in spite of the fact that it is not favorable for the NCP, could be developed more into a full-fledged grand-scale cooperation and communication between all competing parties resulting in a meaningful genuine national dialogue devoid of deceptive or elusive tactical movements. Coexistence and collaboration among the various Sudanese political parties to pave the way for real democratization process can be a blessing not only to the Sudanese community but can have a profound impact on wider regional and global relations.

On the other hand, a confrontational atmosphere encourages a depressing lack of self-confidence and eventual fragmentation or disintegration of the whole country. It is our contention that one way out for the country to achieve economic stability, restoration of honesty, integrity and transparency to government and to accelerate social peace and harmony, the major political players need to coalesce and work together as a coordinated whole. They should be quite aware of the monumental challenges that threaten our very survival. Taking into cognizance the specificity and intricacy of the Sudan's social and cultural configuration, positive and constructive efforts should be exerted by all parties concerned, not only to push forward the peace process but also to disentangle themselves from the existing loophole of the Sudanese political process. Maturation of Sudan's frail democracy should not be based only on the sustainable regularity of election but also on the alteration of power between parties that promote the capability of the electorate process to result in genuine political change. Against such background, our recommendation to enhance the democratic process, the NCP should loosen its strong grip of political power, may be dictated in part by national security necessity, so that rival parties will be able to mount an effective competitive response in the political arena. This might, eventually, ease a discovery of a more viable, comprehensive and inclusive political system capable of accommodating the Sudan's diversity and peaceful transformation of power. Up to now the NCP could be viewed as stabilizing hegemony party, but one has to point out that the shape of Sudan landscape of politics is ever changing and rather difficult to tell for how long will be favorable for this party.

### ***References\****

- National Election Act 2008 Amended 2011 and 2014. National Election Commission, Sudan Currency Printing Company Ltd.  
Results of Sudan General Election 2015, National Election Commission, CD.  
Sudan Election Commission website: [www.nec.org.sd](http://www.nec.org.sd).  
Parties Registration By-Law 2009, Amended 2012.

*The authors are most grateful to the National Election Commission for providing us with the required data for making it possible to write this paper.*

Appendix

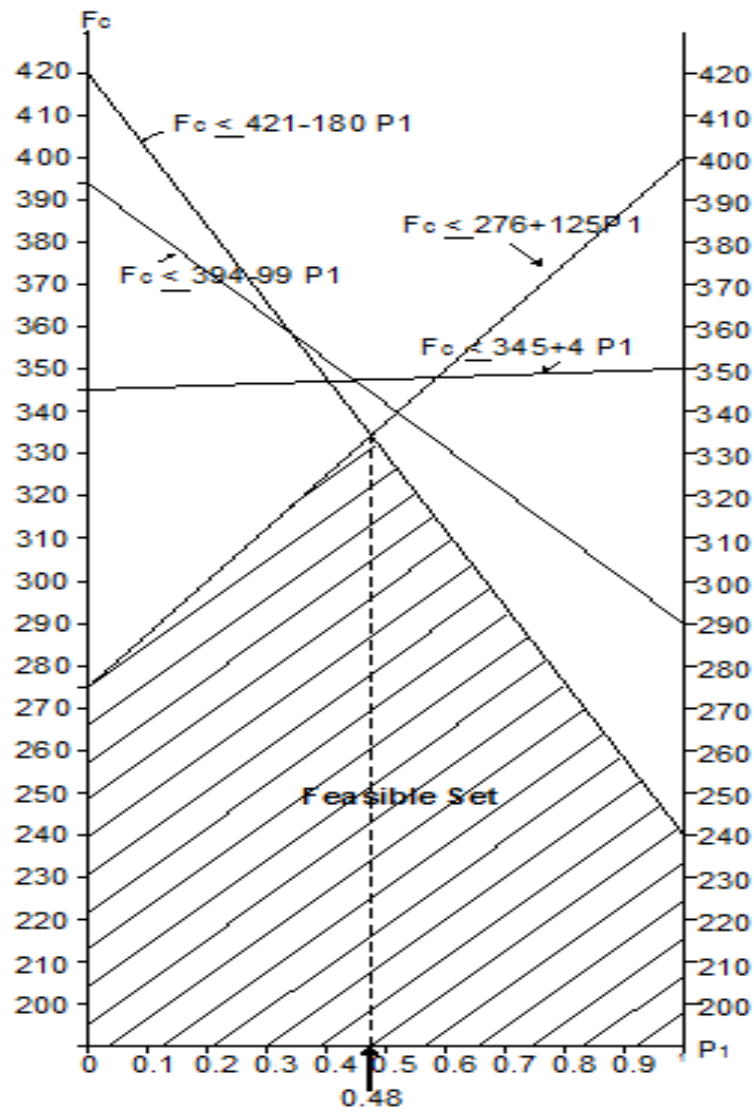


Figure: Linear Programming Solution for the NC Party