The Development of Nigeria and the Bane of Development: A Search for A Satisficing Investment Policy for A Self-Reliant Economy

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Abstract

A Linear Goal Programming model of the Nigerian economy was formulated and solved with a Linear Programming software, Six Pap. The objective function was to maximize the Self-Reliant aspirations of Nigerians. The model consisted of a matrix (124x124) dimension and the purpose was to determine a satisficing investment policy for Nigeria as well as expose the clogs in the wheels of development of the Nigerian economy. The result was positive and indicated that Nigeria should invest, as a matter of priority, in the Manufacturing, Electricity Supply, Services and Construction Sectors. Most of the goals (constraints) were achieved but Oil refining was negative, thus indicating that all is not well with the management of the Oil industry in the country. The economy will only be able to grow at 5.26%. The major clogs in the wheels of development identified included first and foremost, Corruption, which is expected to increase by a shift of 47 folds, followed by Low Labour Productivity, Penchant for imported goods by Nigerians and excessive external borrowing which is expected to increase. Even though the solution is sub-optimal (i.e. Satisficing) and the prescriptions appear difficult to accomplish in reality, the result is very profound in pointing Policy and Decision Makers in the right direction.

Key words: Linear Goal Programming, Six Pap, Satisficing Solution, Investment and Policy.

INTRODUCTION

In 2017, a clarion call was made on the then government of President Mohamadu Buhari to, among other things, invest more in Nigeria (see Aruofor, 2017). It may seem that either the policy and decision makers have not got in contact with such advice and/or are not sufficiently appreciative of the plight and suffering of the masses of Nigeria in order to reflect the yearnings and aspirations of citizens for the achievement of developmental goals.

Indeed, Aruofor and Ogbeide (2024a and 2024b), has renewed this clarion call since the new administration of President Bola Tinubu in 2023 in order to ameliorate the short-term effect of the

policies the administration began with on the one hand and to ensure the long-term development of Nigeria and good governance, on the other hand.

While it will appear too early to determine if the present administration is responding to this advice, it is not clear if the policy and decision makers fully appreciate the ramifications of the prevailing times so as to properly understand what to do, how to proceed and the investment options and specific sectors to invest in.

The purpose of this study is to further reinforce this clarion call and to expose the clogs in the wheels of the progress of development of the Nigerian economy. In particular, it attempts to emphasize the self-reliant aspirations of the generality of Nigerians and formulate it as our objective function with a view to focus the attention of the incumbent administration on the specific sectors of the Nigerian economy that require immediate investment intervention and the requirements for achieving a self-reliant Nigerian economy.

Therefore, the objectives of this study, among others, include:-

1. To build a complete and comprehensive market model of the Nigerian economy, fully updated with the current monthly minimum wage of N70,000.00, domestic fuel price of N617.00/litre and exchange rate of N1,500.00/US$, and use it to search for a quasi-optimal investment policy for the country;
2. In particular, to recognise the aspirations of the generality of Nigerians and use it to specify the objective function of the model accordingly;
3. To apply the total differential systems approach and linear goal programming to determine the requirements for achieving a self-reliant Nigerian economy under the current President Bola Tinubu administration; and
4. Draw conclusions and make some recommendations.

The article is therefore divided into five parts. Part I is the introduction and states the objectives of the study. Part II is the literature review; while Part III is the methodology. In Part IV, the results of the analysis are presented and discussed and Part V concludes the study and makes some recommendations.

LITERATURE REVIEW

Generally, Development is taken as a 'contested' concept in that while all scholars admit that it exists, they might have different notions as to what it actually connotes.

This spans across different perspectives, including the Liberal perspective of evolutionary uni-linear change (Rostow, 1960) and the Radical perspective of a multi-linear change and determined disengagement from an exploitative, non-rewarding relationship (Rodney, 1972).

Differences in Schools of Thought not withstanding, it is undoubtedly agreed that Development creates growth, brings progress with positive change in society. This leads to good quality of life for the citizens which entails happiness, peaceful coexistence and satisfaction of essential needs. This cuts across the various segments of the polity.

Similarly, barrier or bane of Development in a system, with particular reference to Nigeria, includes, amongst others, high level of corruption of ethical and socio-political dimensions (Ekeh,

2024), inadequate infrastructure, poor economic diversification, high level of inequality and poverty as well as inappropriate management of debt.

In a nutshell, true Development can be taken as the capacity and willingness of a system to utilize the harshness of nature or its environment to its advantage. This means that the major ingredient for this task is intrinsic or autochthonous.

According to Investopedia, an investment is an asset acquired to generate income or appreciation. Appreciation is the increase in the value of an asset over time. It requires the outlay of a resource today, like time, effort, and money for a greater payoff in the future, generating a profit. Investing is the acquisition of an asset to build wealth and save money from earned income or appreciation. The primary purpose of investing is to obtain an additional source of income or gain profit from the existing investment over a certain period of time.

An investment policy describes the parameters for investing funds and identifies objectives, preferences, tolerance for risk, constraints on the investment portfolio and how the investment program will be managed. It can also be defined as an undertaking which has an investment policy about how the pooled capital in the undertaking is to be invested in specified underlying assets and managed over time to generate a pooled return for the benefit of investors from whom it has been raised (Wikipedia).

Many articles have been written on the development of the Nigeria economy but most of them had been concerned about insecurity rather than with investment. In order not to go too far afield, we shall just restrict this Literature Review to reviewing some of our past contributions that are still relevant to this study with a view to maintaining a trend and put the review under focus.

Professor Rex Oforitse Aruofor in his inaugural lecture, titled "Economic Systems Engineering, Poverty, Unemployment and Under-Development: A Quest for Solution and Imperatives for Developing the Nigerian Economy" delivered at Benson Idahosa University, Benin City, Nigeria on March 6. 2017, called on the then administration of President Mohamadu Buhari to among other things do the following:

"Nigeria has one of the largest and vibrant consumer markets as far as the international community is concerned. International politics, would want the status quo to remain except Nigerians themselves do something about it. In that regard, Nigeria must start to look inwards and invest and develop all the potential areas of commensurate advantage, if not comparative advantage. By this, we mean areas of comparative needs which tie in with our development aspirations, such that if developed, could result in import substitution if not comparative advantage.
Such areas will include:
1) Agriculture
i. Review of land use policy;
ii. Mobilization of the masses into agricultural production;
iii. Establishment and development of agricultural industries especially food processing.
2) Industry
a) Oil Industry

i. Establish more refineries to satisfy domestic and regional markets;
ii. Develop the petrochemical industry to world standards.
b) Solid Minerals
i. Borrow and complete the Ajaokuta iron and steel mill;
ii. Establish flat sheets mills;
iii. Establish and develop machine tools and bolts and nuts industry.
3) Services
i. Expand, develop and modernize electric power generation and distribution;
ii. Develop the infrastructure;
iii. Invest in qualitative education;
iv. Promote quality assurance research and technology."

It now appears that this advice might not have been taken cognizance of, or in conflict with government's developmental goals for Nigeria.
However, Aruofor and Ogbeide (2024b) have highlighted the channels through which investment occurs in Nigeria and advise Government to promote non-oil exports and invest more in building factories and industries especially in the rural areas of Nigeria as a way of reducing the scourge of poverty and unemployment in Nigeria. Some of the other recommendations include:

- ✓ Address the issue of lopsided income distribution in the country.
- ✓ Build more factories and industries especially in the rural areas of Nigeria.
- ✓ Government must continue to fight corruption, indiscipline and greed in the society in whatever guise it takes.
- ✓ Government must rise up to its responsibility of ensuring the security of life and property in Nigeria.
- ✓ Ensure good governance.

These recommendation have continued to reoccur in most of our publications (vide Aruofor and Ogbeide, 2023a, 2023b, 2024a, 2024b and 2024c).

In another study, Aruofor and Ogbeide, (2017) opined that the new democracy in Nigeria was beneficial to the Nigerian people and that the standard of living increased but that the economy did not grow. They concluded that military dictatorship was not a better option. In another development, Aruofor and Ogbeide (2020) also noted that even though the new democracy in Nigeria has existed for twenty uninterrupted years, corruption was very profound and prevalent in it and that the cost of running government in Nigeria is too exorbitant and needs to be reduced considerably and that this should cut across all tiers of government, Federal, State and Local government.

Aruofor and Ogbeide (2023b, 2024a), observed that in Nigeria, income distribution was lopsided and was skewed to the disadvantage of the poor and that the need for political office holders to reduce their salaries and allowances was urgent. They noted that unemployment and poverty was rife in the country and a source of concern that needed to be addressed. They recommended that apart from building factories and industries especially in the rural areas of Nigeria, government should tackle the problem of insecurity head-on.

On the removal of fuel subsidy and subsequent rise in petrol pump price, Aruofor and Ogbeide (2023a and 2023b), opined that the removal of fuel policy was of high impact and led to soaring commodity prices and the suffering of the masses of Nigeria. They recommended among others, that while it may not be prudent to reverse the policy, that Government should engage in ameliorating the effect by building more factories and industries as well as refurbishing existing refineries apart from building new ones and make them operative. This review shows the trend of the findings that have led to this study.

METHODOLOGY

The comprehensive model of the Nigeria economy consisted of one hundred and twenty four (124) variables Fig. 1. For this study, the data were assembled from the Central Bank Statistical

Fig 1: LEGEND OF VARIABLES NIGERIA MARKET ECONOMY

S/no.	ACRONYMS	ACTIVITY	UNIT
1	NGDP(t)	GDP at Current Basic Prices	N million
2	AGGDD	Aggregate Demand	
3	AGGSS	Aggregate Supply	
4	INVST(t)	Investment	N million
5	AGRSEC(t)	1. Agriculture	N million
6	INDUST(t)	2. Industry	N million
7	MANUFC(t	(c) Manufacturing	N million
8	OILREFIN	OIL Refining	N million
9	ELECTSS(t)	3. Electricity,Gas,Steam & Air conditioner	N million
10	WATER(t)	4. Water supply, sewage, waste Mang.	N million
11	CONSTN(t)	5. Construction	N million
12	SERVCS(t)	C. SERVICES	N million
13	TRADE(t)	1. Trade	N million
14	ACCOFOOI	2. Accomadation and Food Services	N million
15	TRASPOT(t	3. Transportation and Storage	N million
16	TRANSEV(t	e. Transport Services	N million
17	POSTCUR(t	f. Post and Courier Services	N million
18	INFOCOM(	4. Information and Communication	N million
19	TELECOM(t	a. Telecommunications and Information Services	N million
20	PUBLSHN(t	b. Publishing,	N million
21	MPIC&SND	c. Motion Pictures, Sound recording and Music production	N million
22	BRODCST(t	d. Broadcasting	N million
23	ARTRECRT	5. Arts, Entertainment & Recreation	N million
24	FININSUR(	6. Financial and Insurance	N million
25	FINANCE(t)	a. Financial Institutions	N million
26	INSURANS	b. Insurance	N million
27	REALEST(t)	7. Real Estate	N million
28	PROFSERV	8. Professional, Scientific & Technical Serv.	N million
29	ADMINSUI	9. Administrative and Support Services	N million
30	PUBADMN	10. Public Administration	N million
31	EDUCATN(	11. Education	N million
32	HLT&SOC	12. Human Health & Social Services	N million
33	OTHSERVS	13. Other Services	N million
34	DISPINC(t)	Disposable Income	N million
35	REALINC(t)	Real Income	N million
36	REALGDP(t	Real GDP	N million
37	GROWTRT	Growth rate	%
38	GROWTH(t	Growth	N million
39	CONS(t)	Consumption	N million
40	CAPITAL(t)	Capital accumulation	N million
41	FDI(t)	Foreign Direct Investment	N million
42	CPI(t)	Consumer Price Index	
43	INFLTD(t)	Inflation Dummy = 1 when CPI increases, otherwise = 0	
44	INFLATN(t)	Inflation = INFTD X CPI	
45	INFLTRT(t)	Inflation Rate	%
46	UNEMPL(t)	Unemployment Rate	%
47	LABCOMP	Labor Force Compensation	N million
48	MALE	Male Population	Million
49	FEMALE	Female Population	Million
50	URBAN	Urban Population	Million
51	RURAL	Rural Population	Million
52	CHLDRN	Children Population (16 years and below)	Million
53	CHDRNSS	Children Supply	Million
54	EPAWF	Estimated Potencial Active Work Force	Million
55	NADDWF	New Addition to Workforce	
56	POPOLD	Population of Old People (80 years and above)	Million
57	UNEMWF	Unemployed Work Force	Million
58	EMPWF	Employed Work Force	Million
59	EMPLMNT	Employment	Million
60	PRDTIVTY	Productivity	
61	LPROVITY	Labor Productivity	
62	AVWAGE	Average Wage Rate	Naira
63	DDEMENT	Demand for Employment	

Fig 1:   LEGEND OF VARIABLES NIGERIA MARKET ECONOMY CONTINUED

S/no.	ACRONYMS	ACTIVITY	UNIT
64	EMDDPR	Employment Demand Pressure	
65	POOR(t)	Poor	Million
66	EXTPOOR(t)	Extremely (Absolute) Poor	Million
67	POVRT(t)	Poverty Rate	%
68	SLAVERY	Slavery	
69	SAVINGS(t)	Savings	N million
70	BOT(t)	Balance of trade	N million
71	BOP(t)	Balance of payments	N million
72	EXTRES(t)	External reserve	N million
73	DBTBDN(t)	Debt burden or Bondage	
74	OILREV(t)	Oil revenue	N million
75	NOILREV(t)	Non-oil revenue	N million
76	CORPTD(t)	Corruption Dummy = 1 when DDMOPR increases, otherwise = 0	
77	CORRPTN(t)	Corruption= CORPTD X DDMOPR.	
78	DDMONY(t)	Demand for money	N million
79	DDMOPR(t)	Demand for money pressure	
80	DEMOCY(t)	Dummy Variable 1.0 for New Democracy and 0 elsewhere.	
81	CORDEM(t)	Equals DEMOCY x CORRPTN	
82	PWLFARE	Personal Welfare (Per capita income)	Naira
83	STDOLIVN	Standard of Living	
84	PUPWER	Purchasing Power	
85	FODSRITY	Food Security	
86	HLTCARE	Health Care	
87	DDHCARE	Demand for Health Care	
88	HCRDDPR	Health Care Demand Pressure	
89	HRESDEV	Human Resource Development	
90	DDEDUC	Demand for Education	
91	EDUDDPR	Education Demand Pressure	
92	WEALTH	National Wealth	
93	PWEALTH	Personal Wealth	
94	IMPDPEN	Import Dependence	
95	DDIMP	Demand for Imports	
96	PENCIMP	Penchant for Imports	
97	TIME(t)	Time	
98	EXCHRTRP	Exchange rate (Relative poverty)	N million
99	POP(t)	Population	Million
100	IMPORT(t)	Imports	N million
101	XPOTOIL(t)	Oil export	N million
102	XPTNOIL(t)	Non-oil export	N million
103	DODBT(t)	Domestic debts	N million
104	EXTDBT	External debts	$ million
105	GEXPDN(t)	Government expenditure	N million
106	PRIMELR(t)	Primary lending rate	%
107	INTSAV(t)	Interest rate	%
108	MONYSS(t)	Money supply	N million
109	TAX(t)	Tax	N million
110	ACGSC	Agricultural Credit Guarantee Scheme	N million
111	DFUELP(t)	Domestic fuel price	N/Litre
112	INVRRATO	Investment ratio	
113	INVAGRS	Investment in Agriculture	N million
114	INVINDUST	Investment in Industry	N million
115	INVMANU	Investment in Manufacturing	N million
116	INVOILREF	Investment in Oil Refining	N million
117	INVELECTS	Investment in Electricity Supply	N million
118	INVWATER	Investment in Water resources	N million
119	INVCONST	Investment in Construction Sector	N million
120	INVSERVCS	Investment in Services	N million
121	INVTRADE	Investment in Trade	N million
122	INVREALES	Investment in Real Estate	N million
123	INVEDUCA	Investment in Education	N million
124	INVHLT&S	Investment in Health and Social Services	N million

Bulletin (CBN, 2017, 2018, 2019 and 2021) and Aruofor, (2017) and Aruofor and Ogbeide (2019, 2024a and 2024b). The time series ranged from 1981 to 2021. The BMAT (Structural relationships) was estimated by the Total Differential Modeling Software, ESMLAB. This matrix of dimension 124 x 124 is what was used to formulate the Linear Goal Programming Model of the Nigeria economy. The Nigerian economy was already battered and in shambles by 2021 so the 2020 state of the economy which was still fare was adopted as the right hand side (RHS) of our model with every negative output converted to positive values.

Our goals are specified as the constraints of the RHS, which required all sectoral outputs to be overachieved (>) by 2024 and all undesirable variables constrained to be underachieved (<) also by 2024. The RHS was duly adjusted to reflect the 2024 minimum wage of N70,000.00 and captured in the average wage equivalent; for the current domestic fuel price of N617.00/litre, the prevailing exchange rate of N1500.00/US $ and a fully deregulated economy.

The constraint also required that corruption in Nigeria be exactly equal to zero (Corruption Dummy) and more corrupt money be recovered by Government. In addition, the investment ratio, (Investment/Nominal GDP) and Sectoral investments (Investment ratio x Sectoral GDP), were all constrained to be overachieved (>). The details can be inferred from Table 1.

The objective function was captured and derived from the Self-reliant aspirations of Nigerians and given the same weights (see Table 1); this was done because to attach any weights or priority will result in arbitrariness and subjectivity. The details of the objective function include:

1) Maximize
    i. Aggregate demand and Aggregate supply (The Market)
    ii. Investment, investment ratio
    iii. Real income, real output, disposable income, growth and growth rate
    iv. Capital, Foreign Direct Investment
    v. Employment, Productivity and Labor Productivity
    vi. Balance of Trade, Balance of Payments and External Reserve
    vii. Non-oil Revenue and Non-oil Exports
    viii. Personal welfare, Standard of living, Purchasing Power and Food Security
    ix. Wealth and Personal Wealth (per capita savings)
    x. Sectoral investment in:
        ➢ Agricultural
        ➢ Industry
        ➢ Manufacturing
        ➢ Oil Refining
        ➢ Electricity Supply
        ➢ Water Resources
        ➢ Construction
        ➢ Services
        ➢ Trade
        ➢ Real Estate.
        ➢ Education, and
        ➢ Health and Social Services

2) Minimize:
   i. Inflation, Inflation rate and Unemployment rate and unemployed work force
   ii. Employment Demand Pressure
   iii. Poverty rate and Slavery
   iv. Corruption and Corruption in New Democracy
   v. Health care demand Pressure, Education demand Pressure
   vi. Imports, Penchant for Imports and Import Dependence
   vii. Exchange rate and External Debt
   viii. Savings Interest Rate, and
   ix. Domestic Fuel Price

The solution was obtained by solving the problem as a Linear Program using the Six Pap Linear Programming Software. The results are also presented in Table 1. The derivation and estimation of variables are covered in Aruofor (2017, 2019 and 2020) and Aruofor and Ogbeide (2020, 2022a, 2022b, 2023a, 2023b, 2024a, 2024b and 2024c). Indeed the plan to organize series of workshops on Economic Systems Modeling and Analyses and training in the use of ESMLAB for interested Students and Researchers is under way.

RESULTS AND DISCUSSION

The Linear Programme was solved in 982 Iterations before an optimal solution was found and the details of the results are presented in Table 1. The objective function was positive and equal to 1.06e+09.

ACHIEVEMENT OF THE GOALSOR CONSTRAINTS

The Linear Goal Programming results indicate that the goals or constraints were almost completely achieved. Most of the Sectoral outputs were over-achieved except for Oil Refining, Water Resources, Publishing and Arts and Recreation that were under-achieved at –N1.24e+06, N1.32e+05, -N1.14e+05 and N1.54e+05 respectively. Education, Health and Social Services and Other Services were also under-achieved at –N1.36e+06, N3.82e+05 and –N1.78e+07 respectively, which was not complementary or desirable. Indeed, Oil refining will plummet thus suggesting that all is not well with the way oil production and refining are being managed in the country. However, Agriculture was over-achieved at N6.88e+07; Industry was also over-achieved at N2.86e+07 and Manufacturing at N7.99e+07, which were desirable. The economy could only support a growth of 5.26%. Unemployment rate however fell to 7.59% but inflation was still as high as 924.35 points, while average wage fell from N2,025,100.00 to a low of N1.03e+06 which were very undesirable.

In addition, the index of democracy fell from 1 unit to 0.964 which was also not complementary. External Debt also increased from a required low level of –N2.84e+06 to a high level of N6.47e+06 which suggests that the Nigerian economy is being run on borrowed funds. However the investment profiles or goals are all over-achieved. Imports on the other hand are still quite high which is not complimentary to a self reliant economy.

Table 1: DETAILS OF THE LINEAR GOAL PROGRAMMING MODEL OF NIGERIA

RESULT LPNMKE24T1   OBJ. VALUE =   1.06E+09 POSITIVE

S/no.	ACRONYM	OBJ FUNC	REQUIREMENTS	ACHIEVED	REQUIRED	VERDICT
1	NGDP(t)	0	x(1) = 0	constraint no. 1 TRUE : 3.55e+08 >= 1.03e+08		DESIREABLE
2	AGGDD	1	x(2) = 1.17e+06	constraint no. 2 TRUE : 9.18e+06 >= 9.18e+06		DESIREABLE
3	AGGSS	1	x(3) = 0	constraint no. 3 TRUE : 5.14e+07 >= 2.24e+06		DESIREABLE
4	INVST(t)	1	x(4) = 0	constraint no. 4 TRUE : 5.13e+07 >= 1.95e+06		DESIREABLE
5	AGRSEC(t)	0	x(5) = 0	constraint no. 5 TRUE : 6.88e+07 >= 3.18e+07		DESIREABLE
6	INDUST(t)	0	x(6) = 0	constraint no. 6 TRUE : 2.86e+07 >= 2.11e+07		DESIREABLE
7	MANUFC(t	0	x(7) = 0	constraint no. 7 TRUE : 7.99e+07 >= 4.38e+06		DESIREABLE
8	OILREFIN	0	x(8) = 0	constraint no. 8 FALSE : -1.24e+06 >= 5.79e+04		UNDESIREABLE
9	ELECTSS(t)	0	x(9) = 0	constraint no. 9 TRUE : 2.83e+06 >= 5.55e+05		DESIREABLE
10	WATER(t)	0	x(10) = 0	constraint no. 10 FALSE : 1.32e+05 >= 1.41e+05		UNDESIREABLE
11	CONSTN(t)	0	x(11) = 0	constraint no. 11 TRUE : 1.53e+07 >= 3.53e+06		DESIREABLE
12	SERVCS(t)	0	x(12) = 0	constraint no. 12 TRUE : 1.76e+08 >= 9.13e+07		DESIREABLE
13	TRADE(t)	0	x(13) = 0	constraint no. 13 TRUE : 5.73e+07 >= 3.01e+07		DESIREABLE
14	ACCOFOOD	0	x(14) = 0	constraint no. 14 TRUE : 3.28e+06 >= 7.41e+05		DESIREABLE
15	TRASPOT(t	0	x(15) = 0	constraint no. 15 TRUE : 6.16e+06 >= 1.17e+06		DESIREABLE
16	TRANSEV(t	0	x(16) = 0	constraint no. 16 TRUE : 6.22e+04 >= 4.80e+04		DESIREABLE
17	POSTCUR(t	0	x(17) = 0	constraint no. 17 TRUE : 6.96e+04 >= 4.33e+04		DESIREABLE
18	INFOCOM(	0	x(18) = 0	constraint no. 18 TRUE : 3.45e+07 >= 1.61e+07		DESIREABLE
19	TELECOM(t	0	x(19) = 0	constraint no. 19 TRUE : 2.94e+07 >= 1.15e+07		DESIREABLE
20	PUBLSHN(t	0	x(20) = 0	constraint no. 20 FALSE: -1.14e+05 >= 2.62e+04		UNDESIREABLE
21	MPIC&SND	0	x(21) = 0	constraint no. 21 TRUE : 3.07e+06 >= 1.49e+06		DESIREABLE
22	BRODCST(t	0	x(22) = 0	constraint no. 22 TRUE : 5.56e+06 >= 1.76e+06		DESIREABLE
23	ARTRECRTI	0	x(23) = 0	constraint no. 23 FALSE: 1.54e+05 >= 2.26e+05		UNDESIREABLE
24	FININSUR(t	0	x(24) = 0	constraint no. 24 TRUE : 8.39e+06 >= 5.65e+06		DESIREABLE
25	FINANCE(t)	0	x(25) = 0	constraint no. 25 TRUE : 7.28e+06 >= 4.89e+06		DESIREABLE
26	INSURANS(	0	x(26) = 0	constraint no. 26 TRUE : 1.11e+06 >= 7.61e+05		DESIREABLE
27	REALEST(t)	0	x(27) = 0	constraint no. 27 TRUE : 2.67e+07 >= 1.59e+07		DESIREABLE
28	PROFSERV(	0	x(28) = 0	constraint no. 28 TRUE : 1.45e+07 >= 7.18e+06		DESIREABLE
29	ADMINSUF	0	x(29) = 0	constraint no. 29 TRUE : 7.20e+04 >= 4.27e+04		DESIREABLE
30	PUBADMN	0	x(30) = 0	constraint no. 30 TRUE : 7.42e+06 >= 6.77e+06		DESIREABLE
31	EDUCATN(	0	x(31) = 0	constraint no. 31 FALSE: 1.36e+06 >= 1.74e+06		UNDESIREABLE
32	HLT&SOC	0	x(32) = 0	constraint no. 32 FALSE: 3.82e+05 >= 4.16e+05		UNDESIREABLE
33	OTHSERVS(	0	x(33) = 0	constraint no. 33 FALSE: -1.78e+07 >= 3.99e+06		UNDESIREABLE
34	DISPINC(t)	1	x(34) = 2.88e+07	constraint no. 34 TRUE : 2.72e+08 >= 1.42e+08		DESIREABLE
35	REALINC(t)	1	x(35) = 0	constraint no. 35 TRUE : 1.24e+06 >= 7.92e+05		DESIREABLE
36	REALGDP(t	1	x(36) = 5.22e+08	constraint no. 36 TRUE : 4.50e+07 >= 1.86e+07		DESIREABLE
37	GROWTRT(	1	x(37) = 0	constraint no. 37 FALSE: -50.109 >= 70.6512		UNDESIREABLE
38	GROWTH(t	1	x(38) = 0	constraint no. 38 FALSE: 5.2595 >= 18.8188		DESIREABLE
39	CONS(t)	0	x(39) = 0	constraint no. 39 FALSE: 7.60e+07 >= 7.60e+07		DESIREABLE
40	CAPITAL(t)	1	x(40) = 0	constraint no. 40 TRUE : 1.28e+08 >= 1.22e+07		DESIREABLE
41	FDI(t)	1	x(41) = 0	constraint no. 41 TRUE : 1.03e+07 >= 1.22e+06		DESIREABLE
42	CPI(t)	0	x(42) = 0	constraint no. 42 TRUE : 484.1655 >= 336.5791		DESIREABLE
43	INFLTD(t)	0	x(43) = 0	constraint no. 43 TRUE : 4.9153 >= 2.0218		DESIREABLE
44	INFLATN(t)	-1	x(44) = 0	constraint no. 44 TRUE : 924.3538 >= 335.8167		UNDESIREABLE
45	INFLTRT(t)	-1	x(45) = 0	constraint no. 45 TRUE : -129.5864 >= -139.4745		DESIREABLE
46	UNEMPL(t)	-1	x(46) = 0	constraint no. 46 FALSE: 7.591 >= 29.9563		DESIREABLE
47	LABCOMP	0	x(47) = 0	constraint no. 47 TRUE : 1.05e+08 >= 4.16e+07		DESIREABLE
48	MALE	0	x(48) = 0	constraint no. 48 TRUE : 175.2633 >= 129.5116		DESIREABLE
49	FEMALE	0	x(49) = 0	constraint no. 49 TRUE : 172.4814 >= 127.4558		DESIREABLE
50	URBAN	0	x(50) = 0	constraint no. 50 FALSE: 2.5928 >= 46.2564		UNDESIREABLE
51	RURAL	0	x(51) = 0	constraint no. 51 FALSE: 4.5533 >= 81.2338		UNDESIREABLE
52	CHLDRN	0	x(52) = 0	constraint no. 52 TRUE : 306.0543 >= 85.0578		DESIREABLE
53	CHDRNSS	0	x(53) = 0	constraint no. 53 FALSE: 16.3125 >= 35.8162		DESIREABLE
54	EPAWF	0	x(54) = 0	constraint no. 54 TRUE : 184.2174 >= 118.5295		DESIREABLE
55	NADDWF	0	x(55) = 0	constraint no. 55 TRUE : 4.4133 >= 3.2012		DESIREABLE
56	POPOLD	0	x(56) = 0	constraint no. 56 TRUE : 34.7598 >= 22.0706		DESIREABLE
57	UNEMWF	-1	x(57) = 0	constraint no. 57 FALSE: 13.9606 >= 23.2115		DESIREABLE
58	EMPWF	0	x(58) = 0	constraint no. 58 TRUE : 200.6966 >= 66.038		DESIREABLE
59	EMPLMNT	1	x(59) = 0	constraint no. 59 FALSE: -7.5046 >= 29.7246		DESIREABLE
60	PRDTIVTY	1	x(60) = 0	constraint no. 60 TRUE : 18.025 >= 9.6743		DESIREABLE
61	LPROVITY	1	x(61) = 2.55e+06	constraint no. 61 TRUE : 3.50e+06 >= 2.28e+06		DESIREABLE
62	AVWAGE	0	x(62) = 0	constraint no. 62 FALSE: 1.03e+06 >= 2,025,100		UNDESIREABLE
63	DDEMENT	0	x(63) = 0	constraint no. 63 TRUE : 7.377 <= 11.5049		DESIREABLE

Table 1: DETAILS OF THE LINEAR GOAL PROGRAMMING MODEL OF NIGERIA CONTINUED

RESULT LPNMKE24T1   OBJ. VALUE   =   1.06E+09 POSITIVE

S/no.	ACRONYM	OBJ FUNC	REQUIREMENTS	ACHIEVED	REQUIRED VERDICT
64	EMDDPR	-1	x(64) = 41.3588	constraint no. 64 TRUE : 1.8631 <= 1.8631	DESIREABLE
65	POOR(t)	0	x(65) = 0	constraint no. 65 TRUE : -291.1708 <= 58.0893	DESIREABLE
66	EXTPOOR(t	0	x(66) = 0	constraint no. 66 TRUE : 5.416 <= 5.416	DESIREABLE
67	POVRT(t)	-1	x(67) = 0	constraint no. 67 TRUE : 3.9142 <= 3.9142	DESIREABLE
68	SLAVERY	-1	x(68) = 0	constraint no. 68 TRUE : -1.40e+04 <= 1.22e+05	DESIREABLE
69	SAVINGS(t)	0	x(69) = 0	constraint no. 69 TRUE : 6.73e+06 >= 3.21e+06	DESIREABLE
70	BOT(t)	1	x(70) = 8.04e+06	constraint no. 70 TRUE : 1.54e+07 >= 1.15e+07	DESIREABLE
71	BOP(t)	1	x(71) = 4.11e+08	constraint no. 71 TRUE : 1.07e+08 >= 1.10e+07	DESIREABLE
72	EXTRES(t)	1	x(72) = 0	constraint no. 72 TRUE : 1.17e+05 >= 7.23e+04	DESIREABLE
73	DBTBDN(t)	-1	x(73) = 0	constraint no. 73 TRUE : 0.0328 <= 0.4807	DESIREABLE
74	OILREV(t)	0	x(74) = 0	constraint no. 74 TRUE : 2.60e+07 >= 3.32e+06	DESIREABLE
75	NOILREV(t)	1	x(75) = 0	constraint no. 75 TRUE : 1.08e+07 >= 3.92e+06	DESIREABLE
76	CORPTD(t)	0	x(76) = 46.7279	constraint no. 76 TRUE : 0. == 0	UNDESIREABLE
77	CORRPTN(t	-1	x(77) = 0	constraint no. 77 FALSE: -3.38e+04 == 0	DESIREABLE
78	DDMONY(t	0	x(78) = 0	constraint no. 78 TRUE : 2.35e+07 >= 1.63e+07	DESIREABLE
79	DDMOPR(t	-1	x(79) = 0	constraint no. 79 TRUE : 2.99e+04 <= 2.99e+04	DESIREABLE
80	DEMOCY(t)	0	x(80) = 0	constraint no. 80 FALSE: 0.9674 == 1	UNDESIREABLE
81	CORDEM(t	-1	x(81) = 0	constraint no. 81 FALSE: -3.43e+04 == 0	DESIREABLE
82	PWLFARE	1	x(82) = 0	constraint no. 82 TRUE : 1.63e+06 >= 9.91e+05	DESIREABLE
83	STDOLIVN	1	x(83) = 0	constraint no. 83 TRUE : 1.03e+06 >= 2.28e+04	DESIREABLE
84	PUPWER	1	x(84) = 0	constraint no. 84 TRUE : 2.65e+03 >= 887.2764	DESIREABLE
85	FODSRITY	1	x(85) = 0	constraint no. 85 TRUE : 3.31e+05 >= 2.05e+05	DESIREABLE
86	HLTCARE	0	x(86) = 0	constraint no. 86 TRUE : 1.06e+04 >= 4.73e+03	DESIREABLE
87	DDHCARE	0	x(87) = 0	constraint no. 87 TRUE : 3.10e+05 >= 1.18e+05	DESIREABLE
88	HCRDDPR	-1	x(88) = 0	constraint no. 88 TRUE : 1.99e+03 >= 631.0004	DESIREABLE
89	HRESDEV	0	x(89) = 0	constraint no. 89 FALSE: -3.46e+04 >= 6.97e+03	UNDESIREABLE
90	DDEDUC	0	x(90) = 0	constraint no. 90 TRUE : 6.66e+05 >= 8.04e+04	DESIREABLE
91	EDUDDPR	-1	x(91) = 0	constraint no. 91 TRUE : 3.77e+03 >= 759.1067	DESIREABLE
92	WEALTH	1	x(92) = 0	constraint no. 92 FALSE: -0.1578 >= 0.0719	UNDESIREABLE
93	PWEALTH	1	x(93) = 0	constraint no. 93 TRUE : 4.17e+04 >= 2.44e+04	DESIREABLE
94	IMPDPEN	-1	x(94) = 0	constraint no. 94 TRUE : 0.2302 <= 0.5299	DESIREABLE
95	DDIMP	0	x(95) = 0	constraint no. 95 TRUE : 1.03e+07 <= 1.71e+07	DESIREABLE
96	PENCIMP	-1	x(96) = 2.35e+05	constraint no. 96 TRUE : 8.80e+04 <= 8.80e+04	DESIREABLE
97	TIME(t)	0	x(97) = 0	constraint no. 97 TRUE : 104.1572 >= 55.9097	DESIREABLE
98	EXCHRTRP	-1	x(98) = 0	constraint no. 98 TRUE : 577.3051 <= 1,500	DESIREABLE
99	POP(t)	0	x(99) = 0	constraint no. 99 TRUE : 347.7447 >= 256.9674	DESIREABLE
100	IMPORT(t)	-1	x(100) = 0	constraint no. 100 TRUE : 6.89e+06 <= 6.89e+06	DESIREABLE
101	XPOTOIL(t)	0	x(101) = 0	constraint no. 101 TRUE : 2.00e+07 <= 2.00e+07	DESIREABLE
102	XPTNOIL(t)	1	x(102) = 0	constraint no. 102 TRUE : 6.33e+06 >= 2.27e+06	DESIREABLE
103	DODBT(t)	0	x(103) = 0	constraint no. 103 FALSE: 8.44e+06 >= 8.44e+06	DESIREABLE
104	EXTDBT	-1	x(104) = 0	constraint no. 104 FALSE: 6.47e+06 <= -2.84e+06	UNDESIREABLE
105	GEXPDN(t)	0	x(105) = 0	constraint no. 105 TRUE : 1.25e+07 >= 9.52e+06	DESIREABLE
106	PRIMELR(t)	0	x(106) = 0	constraint no. 106 FALSE: 30.265 >= 40.1483	DESIREABLE
107	INTSAV(t)	-1	x(107) = 0	constraint no. 107 TRUE : 7.2799 <= 8	DESIREABLE
108	MONYSS(t)	0	x(108) = 0	constraint no. 108 TRUE : 1.07e+08 >= 1.10e+07	DESIREABLE
109	TAX(t)	0	x(109) = 0	constraint no. 109 TRUE : 4.93e+07 >= 2.43e+06	DESIREABLE
110	ACGSC	0	x(110) = 0	constraint no. 110 TRUE : 1.81e+07 >= 1.81e+07	DESIREABLE
111	DFUELP(t)	-1	x(111) = 0	constraint no. 111 TRUE : 575.4967 <= 617	DESIREABLE
112	INVRRATO	1	x(112) = 0	constraint no. 112 TRUE : 0.3183 >= 0.019	DESIREABLE
113	INVAGRS	1	x(113) = 0	constraint no. 113 TRUE : 1.38e+07 >= 6.03e+05	DESIREABLE
114	INVINDUST	1	x(114) = 0	constraint no. 114 TRUE : 7.16e+06 >= 3.99e+05	DESIREABLE
115	INVMANUI	1	x(115) = 2.59e+07	constraint no. 115 FALSE: 8.31e+04 >= 8.31e+04	DESIREABLE
116	INVOILREFI	1	x(116) = 0	constraint no. 116 TRUE : 1.28e+05 >= 1,097.549	DESIREABLE
117	INVELECTS	1	x(117) = 1.23e+06	constraint no. 117 TRUE : 1.46e+05 >= 1.05e+04	DESIREABLE
118	INVWATER	1	x(118) = 0	constraint no. 118 TRUE : 3.15e+04 >= 2.67e+03	DESIREABLE
119	INVCONSTI	1	x(119) = 3.73e+06	constraint no. 119 TRUE : 4.43e+05 >= 6.70e+04	DESIREABLE
120	INVSERVCS	1	x(120) = 5.86e+07	constraint no. 120 TRUE : 5.53e+07 >= 1.73e+06	DESIREABLE
121	INVTRADE	1	x(121) = 0	constraint no. 121 TRUE : 1.87e+07 >= 5.72e+05	DESIREABLE
122	INVREALES	1	x(122) = 0	constraint no. 122 TRUE : 9.30e+06 >= 3.01e+05	DESIREABLE
123	INVEDUCA	1	x(123) = 0	constraint no. 123 TRUE : 7.82e+05 >= 3.30e+04	DESIREABLE
124	INVHLT&S(	1	x(124) = 0	constraint no. 124 TRUE : 1.23e+05 >= 7.89e+03	DESIREABLE

REQUIREMENTS OF THE OPTIMAL SOLUTION

The optimal result is summarize in Table 2. The result is a satisficing solution and the verdicts are as shown against each basic variable.

Table 2: SUMMARY OF OPTIMAL SOLUTION OF LINEAR PROGRAM

S/no.	BASIC VARIABLES	OPTIMAL VALUE	VERDICT
1	AGGREGATE DEMAND	N1.7e+06	Desirable
2	DISPOSABLE INCOME	N2.88e+07	Desirable
3	REAL OUTPUT	N5.22e+08	Desirable
4	LABOR PRODUCTIVITY	N2.55e+06	Desirable
5	EMPLOYMENT DEMAND PRESSURE	41.3588	Undesirable
6	BALANCE OF TRADE	N8.04e+06	Desirable
7	BALANCE OF PAYMENTS	N4.11e+08	Desirable
8	CORRUPTION DUMMY	46.7279	Undesirable
9	PENCHANT FOR IMPORTS	N2.35e+05	Undesirable
10	INVEST IN MANUFACTURING	N2.59e+07	Desirable
11	INVEST IN ELECTRICITY SUPPLY	N1.23e+06	Desirable
12	INVEST IN CONSTRUCTION	N3.73e+06	Desirable
13	INVEST IN SERVICES	N5.86e+07	Desirable

The Goal Programme prescribed that in order to satisfy the goals and the self reliant aspiration (Objective Function), Government should increase the Aggregate Demand by N1.7e+06. From the social media it is purported that the Federal Government is already doing this in her allocation of funds to the State Governors but the effects are not being felt by the masses of Nigeria. One wonders what is happening to these allocations to State Governors. Does it mean that the typical Nigerian citizen cannot be trusted with money?

The optimal result also indicate that corruption will experience a shift of 46.7279 which implies an increase of about 47 fold in corruption which is absolutely undesirable. The above results go a long way to corroborate the fact that corruption (the penchant for money or the love of money) will be difficult to eradicate completely from contemporary Nigeria. Indeed corruption has been woven into the fabric of Nigeria and completely imbibed into the structural relationship and has become endemic. This also confirms clearly that corruption is indisputably the bane of development of Nigeria.

Moreover, Employment demand pressure will increase by 41.36folds until the prescribed investment policy is implemented. It also prescribes that Labor Productivity be increased to N2.55e+06 which may appear as an uphill task. Indeed the Nigerian economy needs to be more productive because low productivity of labor is also one of the bane of development of the Nigeria economy. The optimal result also prescribed that Nigeria should maintain a positive trade balance

of N8.04e+06 and positive balance of payments of N4.11e+08 and that real output should be increased to N5.22e+08. All these appear like an uphill task. However, in spite of the apparent infeasibility of the above prescriptions as exemplified by the growth in corruption the results of the Linear Goal Programme points us (the policy and decision makers) in the right direction. However it also indicate that our penchant for imported goods will increase by N2.35e+05 which is not complementary to our self reliance.

The result also prescribed the sectors where there should be immediate investment intervention in the Nigeria economy, to include:

- Manufacturing   N2.59e+07
- Electricity Supply   N1.23e+06
- Services   N5.86e+07
- Construction   N3.73e+06

This appears apt because the prescriptions tend to tie in with the reality on ground. Government and the Private Sector can do more in these areas.

CONCLUSION

This study clearly points us in the right direction. It also has identified the priority sectors for immediate investment interventions. The clogs in the wheels of development of the Nigerian economy have also been clearly identified to include corruption, low productivity of Labour, our penchant for imported goods and unsustainable external borrowing.

The need for Nigerians to shun corruption in all its ramifications and to stop celebrating corrupt people cannot be too far stressed. Besides, the penchant for external borrowing is likely to increase as can be inferred from the achievement of our goals. This is clearly undesirable because experience has shown that borrowed funds are misappropriated or used to finance recurrent instead of capital expenditures and this has not augured well for the development of Nigeria, thus keeping the country in perpetual bondage.

From the prescriptions, there is more that the Federal and State Governments can do in building and repairing Nigeria's dilapidated infrastructure and roads. The Private Sector also can do more in assisting Government in constructing factories and investing and expanding the Manufacturing Sector.

RECOMMENDATIONS

Even as infeasible as the solution may appear to the contemporary Nigeria, there is much to be gained from it, thus leading to the following recommendations:

1. The need for Government to shun and fight corruption in all its manifestation and ramifications in Nigeria to a standstill cannot be more overemphasized;
2. The investment policy prescribed in the study is worth implementing; that is, Nigeria should invest, as a matter of priority, in the Manufacturing, Electricity Supply, Services and Construction Sectors;
3. Nigerian Labour force must brace up and become more productive;
4. Nigerians must reduce their penchant for imported goods and aspire to be self-reliant;

5. Nigeria must strive to increase real output; and
6. Rely less on borrowed external funds as means of running the economy.

REFERENCES

Aruofor, R. O. (2017). Economic Systems Engineering, Poverty, Unemployment and Under-Development: A Quest for Solution and Imperatives for Developing the Nigerian Economy. In *Proceedings of the 6th Inaugural Lecture Series,* Benson IdahosaUniversity, March 6.

Aruofor, R. O (2019): Analysis of the Impact of Corruption on an Economy: Understanding the Links and Feedback in the Nigerian Case. *Journal of Research in National Development, 17(2) pp 18-34, December, 2019.*

Aruofor, R. O. K. (2020): ECONOMIC SYSTEMS ENGINEERING: Modeling And Applied Quantitative Techniques For Economic And Development Planning.Amazon Books, ISBN: 9798689936024

Aruofor, R. O and Ogbeide, D. R. (2017): Evaluation of impact of new democracy on consumption, income and growth of the Nigerian economy. *International Journal of Civic Engagement and Social Change (IJCESC) 4(3), pp1-12, July-September 2017*

Aruofor, R. O. and Ogbeide, D. R, (2020): Empirical Evaluation of the Impact of Corruption on Nigeria's New Democratic Governance. *International Journal of Innovative Social Sciences & Humanities Research 8(3):69-90, July-Sept., 2020*

Aruofor, R. O. and Ogbeide, D. R, (2022): The ImpactOfBoko Haram Insurgency And Banditry On The Nigerian Economy: Understanding The Causes And Feedback. *International Journal of Innovative Development and Policy Studies 10(1):14-26, Jan.--Mar., 2022*

Aruofor, R. O. and Ogbeide, D. R, (2022): The Buhari-Osinbajo Regime in Nigeria: A Post Mortem. *Journal of Public Administration and Social Welfare Research E-ISSN 2756-5475 P-ISSN 2695-2440 Vol. 7 No. 1 pp 17-34, 2022*

Aruofor, R. O. and Ogbeide, D. R, (2023a): The Impact Of Fuel Subsidy On The Nigerian Economy In The Fourth Republic: An Analysis. *International Journal of Social Sciences and Management Research (IJSSMR) E-Issn 2545-5303 P-Issn 2695-2203 Vol. 9 Issue 5, pp 63-80,* June 2023.

Aruofor, R. O. and Ogbeide, D. R, (2023b): Evaluation Of The Consequences And Implications Of The Domestic Petrol Pump Price Increase In Nigeria By The Bola TinubuAdministration. *Journal of Humanities&Social Policy (JESP) Volume 9 September Issue, 2023, pp 42-61*

Aruofor, R. O. and Ogbeide, D. R, (2024a): Analysis Of Poverty And Unemployment InNigeria's Fourth Republic: An Outlook To Year 2035. *International Journal of Social Sciences and Management Research, (IJSSMR) E-Issn 2545-5303 P-Issn 2695-2203Vol10 No. 1, pp 42-54, 2024*.

Aruofor, R. O. and Ogbeide, D. R, (2024b):An Escalating Analysis of the Role, Impact and Ramification of Investment in the Nigerian Economy and Outlook to Year 2035 *International Journal of Social Sciences and Management Research E-ISSN 2545-5303 P-ISSN 2695-2203 Vol 10. No. 3 pp. 77-104, 2024www.iiardjournals.org* IIA

Aruofor, R. O. and Ogbeide, D. R, (2024): A Simulation Analysis of President Bola Tinubu's Price Deregulation Policy on the Nigerian Economy: An Outlook to Year 2035 *Journal of Public Administration and Social Welfare Research E-ISSN 2756-5475 P-ISSN 2695-2440 Vol. 9 No. 1, pp. 74-100, 2024 jpaswr www.iiardjournals.org*

CBN (2017). *Central Bank of Nigeria Statistical Bulletin,* Abuja.
CBN (2018). *Central Bank of Nigeria Statistical Bulletin,* Abuja.
CBN (2019). *Central Bank of Nigeria Statistical Bulletin,* Abuja.
CBN (2021). *Central Bank of Nigeria Statistical Bulletin,* Abuja.
Ekeh, F. I. (2024). Corruption as the bane of national development in Nigeria. *African Journal of Social and Behavioural Sciences*, Vol. 14, No. 2.

Rodney, W. (1972). *How Europe underdeveloped Africa*. Tanzania: Tanzanian Publishing House.

Rostow, W. W. (1960). *The stages of economic growth: A non-communist manifesto*. Cambridge: Cambridge University Press.