Bullion

Volume 45 | Number 4 Article 5

12-2021

Activity series of the Central Bank of Nigeria's development finance interventions

Xavier-Itam A. Okoh
Central Bank of Nigeria

George N. Ude
Central Bank of Nigeria

Activity Series of the Central Bank of Nigeria's Development Finance Interventions

Xavier-Itam A. Okon (Ph.D)
Development Finance Department
Central Bank of Nigeria

George N. Ude
Development Finance Department
Central Bank of Nigeria

Abstract

The Central Bank of Nigeria (CBN) aggressively pursues credit and interest rate policies to promote inclusive economic growth. Through this, it aims to expand availability, access, and affordability of financial capital for micro, small and medium enterprises (MSMEs). With at least 24 MSMEs financing programmes of its own, the Bank manages one of the largest suites of developmental programmes among central banks. This paper attempted to serialize and characterize these programmes, hence determine their activity status and discover patterns of implementation effort, patronage, and responsiveness of target enterprises to available incentives. Applying Z-score and min-max methods of normalization and geometric and arithmetic aggregation techniques, the study develops a composite indicator and establishes a broad ranking of programmes, based on cumulative loan disbursements, outreach (loan volumes) and principal repayments. Results showed that programmes specifically focused on agriculture and those introduced to rev the economy following the COVID-19 pandemic, dominated the activity series. Programmes specifically targeting youths and multi-sectors were among those with the least activity. It is recommended that the Bank identifies why some interventions are not optimal, work to reverse the trend and achieve stated objectives.

Keywords: *Central Bank of Nigeria, CBN, composite indicator, development finance.*

JEL: *Classification: C43, E51, E58.*

1.0 INTRODUCTION

In pursuit of its developmental mandate of stimulating financial and economic development, the Central Bank of Nigeria (CBN) is aggressively pursuing credit and interest rate policies to promote inclusive economic growth. This course of action aims to expand the availability, access, and affordability of credit for micro, small and medium enterprises (MSMEs) that are generally acknowledged to be engines of growth (Keskİn et al, 2010; African Development Bank, AfDB, 2011; Oduntan, 2014; Opafunso and Adepoju, 2014; Obi et al, 2018; PricewaterhouseCoopers (PWC), 2020; Erdin and Ozkaya, 2020).

With at least twenty-four MSMEs financing programmes (CBN, 2020), it is unarguable that the CBN operates one of the largest collections of development finance interventions or programmes among central banks. However, it is one thing to introduce a programme and another to ensure adequate activity levels under it, activity levels that are commensurate with expected outcomes. For the scope of our work, a pertinent question is how to determine the activity levels.

Experientially, the activity level in any CBN development finance intervention is primarily traceable by the amount disbursed, outreach or volume of projects/ enterprises financed, and amount repaid. These three indicators constitute the standard summary performance report for the interventions (CBN, 2020) and, in general, are considered immediate and convenient proxies for remote quantitative impact measures. When taken cumulatively, they serve as approximate measures of effort exerted in managing an intervention, the level of programme uptake by intended users, and their responsiveness to available policy incentives often championed in the programme guidelines and implementation framework.

Like the activity (or reactivity) series of metals, this paper attempts to characterize and serialize CBN's development finance interventions to determine their activity levels. By broadly distinguishing between the interventions along activity levels, it is possible to have specific insights for evidence-based policy formulation and reviews. It is equally possible, albeit to a lesser extent, given periodic or snapshot updates to the proposed framework, to assess "displacement" or "substitution" effects among the array of inter-related interventions. Both perspectives are required to maximize or, at least, optimize desirable intervention efforts and outcomes.

Applying Z-score and min-max methods of normalization and geometric and arithmetic index techniques to cross-sectional data on the interventions, the paper develops a composite indicator to establish a broad ranking of the programmes using three indicators: cumulative loan disbursements, outreach (loan volumes), and principal repayments. The composite indicator is made invariant to the number of years the programme has been in operation and the average size of enterprises financed in the programme by adjusting for both factors.

Following this introduction, the paper reviews theoretical and empirical considerations in Section Two, presents the methodology in Section Three, and discusses the results and findings in Section four. It concludes with recommendations in Section five.

2.0 Theoretical and Empirical Considerations

The Organization for Economic Cooperation and Development (OECD) posits that a composite indicator is a combination of individual indicators into a single index, having regard for an underlying model of the multi-dimensional concept being measured. It should, ideally, rely on a theoretical framework which allows individual indicators or variables to be systematically selected, combined and weighted to reflect the dimensions or structure of the phenomena being measured (OECD, 2004).

Individual indicators, also known as component indicators, components, or sub-indicators, must be combined contingent on certain theoretical considerations and statistical representations that culminate in one, unified indicator. These statistical representations maybe simple or complex, depending on the issue of interest, but the composite index is usually constructed as an average of indicators or sub-indices, an aggregate measure of a combination of factors.

The multidimensionality of development is the motivation behind major composite indicators that assess countries on performance in specified parameters. Such indicators include the United Nations Human Development Index (3 dimensions), Global Entrepreneurship Index (14 pillars); Global Competitiveness Index (12 pillars); Gender Inequality Index (3 dimensions); Ease of Doing Business Index (10 pillars, 41 sub-indicators); Global Findex (6 dimensions); and the Nigeria Multidimensional Poverty Index (4 dimensions, 11 indicators).

The OECD-Joint Research Council handbook on the construction of composite indicators (OECD-JRC, 2008) opined that composite indicators could be misleading if poorly constructed or wrongly interpreted, as their "big picture" outcomes may prompt simplistic diagnostic or policy conclusions. Rather, such indicators should serve to initiate discussions and arouse public attention and their significance should be assessed with respect to subjects affected by the composite index.

According to Saisana (2004), composite indicators should be identified as "simplistic presentations and comparisons of performance in given areas to be used as starting points for further analysis and discussion". To the extent that this is so, it is believed that they are useful for summarization of relative performance and ordinal rankings which may not necessarily imply an assessment of depth. Greco et al (2019) reviewed methodological issues of composite indices, particularly, weighting, aggregation, and robustness. They concluded that although composite indicators met the need for consolidation and aggregation of a plethora of indicators into a sole number that encompasses and summarises information, they should be interpreted with extreme caution, especially when important conclusions are to be drawn relying on these measures.

After a review of several international quality frameworks for developing statistics and composite indices, Farrugia (2007) summarized the desirable attributes of a composite indicator as:
(i) accuracy – properly estimates or defines the quantities or characteristics it is intended to measure).
(ii) simplicity and ease of comprehension.
(iii) methodological soundness – logical connection between the different sub-indices and mutually-consistent methodology justified by sound conceptual principles.
(iv) suitability for international and temporal comparisons – the variables are measured in a homogenous manner.
(v) transparency – ready availability of the methodology upon which the composite index was constructed.
(vi) accessibility – ready available of the composite index across time and space.
(vii) timeliness and frequency – the length of time between publication of the composite index and the event or phenomenon it describes and the frequency

with which the composite index is published; and (viii) flexibility – how relatively flexible the composite index is in allowing for changes in content, purpose, method, comparative application, and focus.

Moreira and Crespo (2016) asserted that composite indicators are mathematical combinations of a set of indicators whose extensive use had generated strong debate over conceptual and methodological arguments for and against the measurement approach. They reviewed the pros of composite indicators, including their multidimensionality; ease of interpretation compared to a battery of separate indicators; facilitation of comparisons of performance across space and over time, thereby attracting public interest; and the reduction of the size of a list of indicators without losing basic information.

On the other hand, their review of the disadvantages indicated that composite indicators always excluded some vital elements of the phenomenon; specific components may be quantified with the help of different variables; inability to reveal more than what a single variable alone reveals; inconsistency in the selection process of the variables; lack of clear rationale for the selected weighting and aggregation techniques; and an absence of practical value if they proffer no precise policy recommendation.

Gómez-Limón et al (2020) constructed a composite indicator to measure environmental sustainability using alternative weighting methods, namely, analytic hierarchy process, best-worst method and the point allocation method. The methodological approach adopted followed the sequence of indicator selection and data gathering, normalization, weighting, and aggregation. They found that the values of the composite indicators from the different methods yielded similar rankings of the olive farms studied, with a high level of consistency.

The United Nations Development Programme (UNDP, 2020) calculated the Human Development Index (HDI) by creating the indices for the three dimensions – health, education and standard of living – using min-max normalization technique, aggregating the dimensional indices using geometric mean technique and, in the case of the inequality-adjusted HDI, adjusting for inequality in the dimensional indices earlier derived and taking the unweighted average of these inequality-adjusted dimensional indices (UNDP, 2020).

The Gender Inequality Index (GII), with three dimensions – reproductive health, empowerment and labour market – and five indicators, indicates the following calculation steps: treatment of zero and extreme values; aggregation of indicators, firstly, across dimensions within each gender using geometric mean, and secondly, across gender groups using harmonic mean; calculation of the geometric mean of the arithmetic means for each indicator; and calculation of the GII by dividing the harmonic mean by the geometric mean and subtracting the resulting quotient from 1, i.e., unity (UNDP, 2018).

De Muro et al (2011) developed the Mazziotta Pareto Index (MPI) to measure the Millennium Development Goals (MDGs) and compared the MPI with the HDI and the Human Poverty Index (HPI). The MPI adopted a linear aggregation method that penalized observed units (countries or geographical areas, for instance) with "unbalanced" values of the indicators, thereby assuming imperfect substitutability between various dimensions of development or poverty. The MPI and the HPI were similar because they penalized in the same direction, whereas the MPI and the HDI were dissimilar since they latter did not penalize for unbalanced set of indicators.

The Food Insecurity Multidimensional Index (FIMI), which synthetizes four dimensions of food security, viz, availability, access, utilization, and stability of food, with twenty indicators, into a composite indicator, progresses from a multivariate analysis of each dimension for internal consistency, through min-max normalization, to the aggregation of indicators for each dimension and for the four dimensions. The methodology adopts arithmetic mean with equal weights for aggregation of the indicators and power-three mean for the dimensions, to derive the synthetic index of food insecurity (Napoli et al, 2011).

The Global Hunger Index (GHI), which measures and tracks hunger at global, regional, and national levels, is intended to raise awareness and understanding of hunger problem, offer a basis for comparison of levels of hunger between nations, and attract focus to areas where hunger is prevalent, and with the greatest need for additional efforts to eliminate it. Its four indicators – undernourishment, child wasting, stunting and mortality – along three equally-weighted dimensions, are determined from available data for each country, standardized against thresholds set slightly above the highest country-level values observed worldwide for that indicator, and the standardized scores are aggregated to derive the GHI (GHI, 2020).

Cornell University et al (2020) showed that, included in the Global Innovation Index (GII) are a total of eighty indicators under seven pillars and three indices: the innovation input sub-index averages scores in five pillars; the innovation output sub-index averages scores in two pillars; and the GII is the average of the input and output sub-Indices which are assigned equal weights.

Extension of the composite indicator concept, which is steeped in the multidimensional approach to the measurement of development, to the assessment of socio-economic welfare and developmental programmes is not out of place. This is so because of the multi-faceted key performance indicators often associated with the measurement of progress in such programmes. Its application to the large portfolio of diverse MSME financing interventions of the CBN, could contribute to unravelling gaps and promoting opportunities for improvement in programme implementation. It would also permit a temporal comparison of achievements.

This extension is actualized by conceptualizing each intervention or programme as a country or region, and the dimensions as disbursements, outreach, and principal repayments. To keep the generalization simple, each dimension is hypothesized to have one indicator or component, as elaborated in the next section.

3.0 METHODOLOGY

Data on cumulative disbursements, number of projects and principal repayments in the enterprise financing interventions of the CBN were obtained from the Bank's Economic Report for the fourth quarter 2020. The financial data were reported in billions of naira unit and the interventions were:

i. Commercial Agriculture Credit Scheme (CACS).
ii. Paddy Aggregation Scheme (PAS).
iii. Rice Distribution Facility (RDF).
iv. Anchor Borrowers' Programme (ABP).
v. Accelerated Agricultural Development Scheme (AADS).
vi. Micro, Small and Medium Enterprises Development Fund (MSMEDF).
vii. Shared Agent Network Expansion Facility (SANEF).
viii. Small and Medium Enterprises Re-financing and Restructuring Facility (SMERRF).
ix. Real Sector Support Facility (RSSF).
x. Covid-19 Intervention for the Manufacturing Sector (CIMS).
xi. Textile Sector Intervention Facility (TSIF).
xii. CBN-BOI Industrial Facility (CBIF).
xiii. Power and Airline Intervention Fund (PAIF).
xiv. Nigeria Electricity Market Stabilization Facility (NEMSF).
xv. Nigerian Bulk Electricity Trading - Payment Assurance Facility (NBET-PAF).
xvi. National Food Security Programme (NFSP).
xvii. Presidential Fertiliser Initiative (PFI).
xviii. Non-Oil Export Stimulation Facility (NESF).
xix. Export Development Facility (EDF).
xx. Agri-business/ Small and Medium Enterprises Investment Scheme (AGSMEIS).
xxi. Targeted Credit Facility (TCF).
xxii. Maize Aggregation Scheme (MAS).
xxiii. Healthcare Sector Intervention Facility (HSIF).
xxiv. Youth Empowerment Development Programme (YEDP).

The three variables earlier mentioned constituted our dimensions and indicators. In other words, each dimension comprised one indicator, which was itself. Since each dimension had just an indicator, it was not necessary to conduct multivariate analysis of the principal component analysis type or the like. In this regard, the analysis followed this sequence of procedures:

(i) Normalization or scaling – This was carried out to transform data values to the same scale to give them equal importance or prominence. The resultant distribution is a standard normal distribution with mean of zero and standard deviation equal to one, which is a desirable statistical property for stability. Two widely used scaling methods, the Z-score and the min-max, were applied, to assess the robustness of the composite indicator to different normalization methods.

The Z-score is the difference between an observation and the mean of the distribution, divided by the standard deviation. It is given as:

$$Z = \frac{X-\mu}{\sigma} \quad . \quad . \quad . \quad . \quad . \quad (3.1)$$

where Z = Z-score of each observation
X = Individual data point or observation
μ = Mean of the distribution of datapoints
σ = Standard deviation of the distribution

The min-max normalization is implemented by the following function:

$$X_{norm} = \frac{X - X_{min}}{X_{max} - X_{min}} \quad . \quad . \quad . \quad . \quad . \quad (3.2)$$

where X_{norm} = Normalized value of individual data point
X = Individual data point or observation
X_{min} = Minimum data value in the distribution
X_{max} = Maximum data value in the distribution

(ii) Definition of dimension indices - to facilitate the min-max scaling, it was necessary to define the dimension indices, that is, the minimum and maximum values for each dimension. An option is to set such limits using values within the observed dataset. Another is to do so outside the observed data based on some historical evidence, behavioural assumptions about the phenomena, or empirical rationalizations. For instance, in calculating the HDI, the UNDP (2020) specified "natural zeros" and "aspirational targets" for the minimum and maximum values, respectively. It described these values as "goalposts" set to transform the indicators expressed in different units into indices between 0 and 1. These were not the observed extrema of the original distribution but theorized a priori values.

Specifically, the life expectancy indicator under the health dimension was given minimum value of 20 years because, historically, no country in the 20th century had a life expectancy of less than 20 years; and a maximum value of 85 years as this was a realistic aspirational target for many countries over the previous 30 years. Under education dimension, the expected years of schooling indicator had its minimum fixed at zero because societies can subsist without formal education, and the maximum at 18 years, which was equivalent to earning a master's degree in most countries, and so on. Explanations were also given for fixing the minimum and maximum values of the standard of living dimension, measured by the gross national income per capita, at US$100 and US$75,000, respectively.

Akin to this, the Global Hunger Index (2020) set thresholds which were a bit higher than the highest country-level values observed worldwide for each indicator between 1988 and 2013. This was to allow room for possible future growth. As an illustration, it stated that the highest value for the undernourishment dimension was 76.5 per cent, but the threshold for standardization was set at 80 per cent.

For this study, observed data values were used to set the dimensions (Table 3.1).

Table 3.1: Dimension indices for the study

S/N	Dimension	Minimum	Maximum	Remarks
1	Disbursements	0.17	866.0	YEDP is min., NBET-PAF is max.
2	Outreach	1	2,504,690	RDF, NBET -PAF and EDF are min., ABP is max.
3	Repayments	0	443.9	RDF, AADS, CIMS, CBIF, NVET - PAF, EDF and TCF are min. , CACS is max.

Source: Authors (from observed data in Table 4.1).

(iii) Adjustments – the normalized scores were modified by the reciprocals of both size of enterprises financed and the age of the intervention, to eliminate their effects on the final indicator. This was considered apt because the larger the size of enterprise targeted under a programme, the higher the likelihood of large single disbursements and high values of cumulative disbursements; and the longer a programme has been in existence, the higher the probability of high cumulative disbursements and principal repayments.

The size of enterprises financed was taken as the average size by assets of the category of enterprises targeted. The National Policy on MSMEs provides the most consistent definition of micro, small and medium enterprises as, among others, having assets (excluding land and building) of less than ₦5.0 million, ₦5.0 to less than ₦50.0 million, and ₦50.0 million to less than ₦500.0 million, respectively. The mid-values of these ranges, which translated to their means, or their averages if more than one enterprise size was targeted, were the size deflators. For instance, the ABP disbursements target micro farmers, whose assets should be between 0 and ₦5.0 million. The approximate mid-value was ₦2.5 million, which was adopted. For the MSMEDF which targets micro, small and medium, the average of the approximate mid-values was the deflator. That is, the average of ₦2.5 million. ₦25.0 million and ₦250.0 million, which was ₦92.5 million.

The age of the programme defines its path over time from introduction to date. With the passage of time, evolutionary characteristics arising from the review of modalities tend to set in and drive, or should drive, implementation. Controlling for this was to allow programmes that had operated for relatively shorter periods because of when they were introduced, to be representatively captured without lifespan bias. Whereas it was relatively easy to specify the duration of operation for the interventions that were existent up to 2019, the COVID-19 era interventions, namely, TCF, CIMS and HSIF, were specified as approximately one year old since they had each been operated for at least half a year by end-2020.

More exclusively, normalized disbursements and outreach were adjusted for both size of enterprises and programme age since a high correlation was hypothesized between them. Conversely, normalized repayments were adjusted for age of the programme only. It was assumed that enterprise size does not affect repayments directly but indirectly since repayments itself was a function of disbursements.

Before these adjustments were made, there was need to address negative and zero values arising

from the normalization process. This is a condition precedent to geometric means aggregation, which breaks down in the presence of both. It also improves interpretability of the results, as negative or zero indicator values would be unseemly and confusing. All the values – not only the zero or negative values – in a normalized distribution or series would have to be treated similarly, to retain the normal distribution properties. The addition of a constant that is high enough to make the series positive suffices. Having noted this, the minimum positive normalized value for the series scaled by the min-max method was added to each normalized value while twice the negative of the minimum normalized value for the series scaled by the Z-score method was added to its series.

(iv) Aggregation – as is standard practice in the methodology, arithmetic and geometric mean aggregation methods were adopted to bring the three sub-indices together to produce a single indicator. The geometric mean is useful in reducing the effect of outliers which were not in short supply in the datasets here, especially in the outreach dimension with extremes of 1 and 2,504,690.

The arithmetic mean is the quotient from the summation of adjusted normalized scores and the number of values so summed up. That is,

$$\mu = \frac{X_1 + X_2 + X_3 + \cdots + X_n}{n} = \frac{\sum X}{n} \quad . \quad . \quad . \quad . \quad . \quad (3.3)$$

where μ = Mean of the distribution of scaled datapoints

$X_1, \ldots, X_n$ = Adjusted normalized scores

n = Number of adjusted normalized values

Geometric mean analysis centred on the execution of (3.4) which is the nth root of the product of the adjusted normalized values, given as:

$$\left(\prod_{i=1}^{n} X_i\right)^{1/n} = \sqrt[n]{X_1 X_2 X_3 \ldots X_n} \quad . \quad . \quad . \quad . \quad . \quad (3.4)$$

where Π = Mean of the distribution of scaled datapoints

n = Number of adjusted normalized values

$X_1, \ldots, X_n$ = Adjusted normalized scores

(v) Categorization – to summarize the activity level of the interventions, they were categorized, building on the composite indicators derived in the last stage, into broad groups, namely, remarkably high, high, moderate, low, and extremely low activity. It is known that the different methodologies applied to calculate the indicators would produce different indicator series and, hence, rankings of the programmes. It would also be preposterous to base subsequent discussion on the indicator from one or a few of the methods. To harmonize these series and obtain a single indicator value for clarity and ease of interpretation, the values of the indicator for each programme, as derived from the different methodologies, were summed up to derive a magnitude value and this sum or magnitude value was the single composite indicator. This was then ranked for all interventions and the ranking partitioned into upper, upper middle, middle, lower middle and lower segments corresponding to the five broad activity groupings, stemming from determination of the 80th, 60th, 40th and 20th percentiles. The values derived in this stage defined the activity series and were used to characterize the programmes. The summation of indicators from all the methodologies and the mapping of the sum onto a 5-segment percentile scheme for characterization purposes marked the novelties of this study.

4.0 Results and Discussion

4.1 Findings

The dataset for the study is presented in Table 4.1, which shows the cumulative number of loans (volume), disbursements and repayments.

#	Intervention/ Programme	Cumulative			Deflator	
		# of Projects (Outreach)	Disbursements (₦'bn)	Repayments (₦'bn)	Beneficiary Average Asset Base (₦'bn)	No. of Years in operation (as @ Dec. 2020)
1	CACS	636	672.90	443.90	0.25	11
2	PAS	21	95.50	93.50	0.25	3
3	RDF	1	1.00	0.00	0.25	2
4	ABP	2,504,690	497.20	118.70	0.0025	5
5	AADS	9,983	14.90	0.00	0.0025	2
6	MSMEDF	216,704	83.90	34.70	0.0925	7
7	SANEF	13	5.50	0.64	0.025	2
8	SMERRF	604	300.90	151.10	0.25	10
9	RSSF	25	166.20	22.50	0.25	6
10	CIMS	111	228.20	0.00	0.25	0.5
11	TSIF	41	78.00	3.10	0.25	4
12	CBIF	60	100.00	0.00	0.25	3
13	PAIF	74	311.20	194.60	0.25	10
14	NEMSF	37	189.20	70.30	0.25	5
15	NBET-PAF	1	866.00	0.00	0.25	3
16	NFSP	4	59.10	11.40	1.0	4
17	PFI	18	35.00	10.80	0.25	3
18	NESF	13	44.00	12.00	0.25	5
19	EDF	1	50.00	0.00	0.25	2
20	AGSMEIS	22,057	83.50	0.21	0.0025	3
21	TCF	317,949	149.20	0.00	0.0025	0.75
22	MAS	7	6.00	6.00	0.25	2
23	HSIF	62	60.70	0.78	0.25	0.5
24	YEDP	67	0.17	0.51	0.0025	4
	Total	**3,073,179**	**4,098.27**	**1,174.74**	**5**	**98**
	Min	**1**	**0.17**	**0.00**	**0.0025**	**0.5**
	Max	**2,504,690**	**866.00**	**443.90**	**1.00**	**11.00**
	μ	**128,049**	**170.76**	**48.95**	**0.21**	**4.07**
	δ	**511,969**	**221.42**	**100.04**	**0.20**	**2.93**

Source: CBN Economic Report Q4: 2020 and authors' compilation

The last two columns show the average asset base of enterprises targeted by each intervention and the age of the intervention. A total of 12.5 per cent (or three) of programmes financed a single project while about 30 per cent (or seven) recorded zero principal repayments within the study period.

Programmes with a single project financed were the EDF, where wholesale disbursement was to a development finance institution; and NBET-PAF, where funds were disbursed to a public institution as obligor. The seven programmes for which there were no principal repayments included interventions such as the CBIF and the NBET-PAF, which were operational before the onset of COVID-19 and whose moratoria were extended in the wake of the pandemic. The wide ranges and standard deviations for all three series were generally suggestive of non-normal distributions which the normalization methods addressed.

In Table 4.2, normalized scores can be seen to narrow the distance between observations.

Table 4.2: Normalized scores

#	Programme	MIN-MAX NORMALIZATION			Z-SCORE NORMALIZATION		
		# of Projects	Disbursements	Repayments	# of Projects	Disbursements	Repayments
1	CACS	0.0002535	0.7769770	1.0000000	-0.2488686	2.2678109	3.9480757
2	PAS	0.0000080	0.1101024	0.2106330	-0.2500698	-0.3399026	0.4453615
3	RDF	0.0000000	0.0009586	0.0000000	-0.2501089	-0.7666933	-0.4892954
4	ABP	1.0000000	0.5740503	0.2674026	4.6421534	1.4742964	0.6972690
5	AADS	0.0039853	0.0170126	0.0000000	-0.2306116	-0.7039167	-0.4892954
6	MSMEDF	0.0865189	0.0967049	0.0781708	0.1731644	-0.3922918	-0.1424227
7	SANEF	0.0000048	0.0061559	0.0014418	-0.2500855	-0.7463699	-0.4828977
8	SMERRF	0.0002407	0.3473315	0.3403920	-0.2489311	0.5877461	1.0211501
9	RSSF	0.0000096	0.1917582	0.0506871	-0.2500620	-0.0206000	-0.2643779
10	CIMS	0.0000439	0.2633658	0.0000000	-0.2498940	0.2594108	-0.4892954
11	TSIF	0.0000160	0.0898906	0.0069836	-0.2500308	-0.4189379	-0.4583068
12	CBIF	0.0000236	0.1152998	0.0000000	-0.2499937	-0.3195793	-0.4892954
13	PAIF	0.0000291	0.3592276	0.4383870	-0.2499663	0.6342640	1.4559905
14	NEMSF	0.0000144	0.2183223	0.1583690	-0.2500386	0.0832750	0.2134466
15	NBET-PAF	0.0000000	1.0000000	0.0000000	-0.2501089	3.1399091	-0.4892954
16	NFSP	0.0000012	0.0680619	0.0256815	-0.2501030	-0.5042961	-0.3753372
17	PFI	0.0000068	0.0402273	0.0243298	-0.2500757	-0.6131390	-0.3813350
18	NESF	0.0000048	0.0506219	0.0270331	-0.2500855	-0.5724923	-0.3693394
19	EDF	0.0000000	0.0575517	0.0000000	-0.2501089	-0.5453944	-0.4892954
20	AGSMEIS	0.0088059	0.0962429	0.0004731	-0.2070282	-0.3940983	-0.4871962
21	TCF	0.1269411	0.1721239	0.0000000	0.3709203	-0.0973771	-0.4892954
22	MAS	0.0000024	0.0067334	0.0135166	-0.2500972	-0.7441118	-0.4293174
23	HSIF	0.0000244	0.0699098	0.0017572	-0.2499898	-0.4970700	-0.4814982
24	YEDP	0.0000264	0.0000000	0.0011489	-0.2499800	-0.7704418	-0.4841973

Source: Authors' compilation

The zero values in the min-max-normalized series and the negative values in the Z-score-normalized series were treated as in Section 3.0, by the addition of constants. That is, for the min-max-normalized distributions, the minimum positive normalized value for the series, that is, 0.0000012, 0.0009586 and 0.0004731, were added to relevant normalized values.

For Z-score-normalized distributions, twice the negative of the minimum normalized value, that is, -0.2501089, -0.7704418 and -0.4892954, were added to relevant scaled series, to produce all-positive values, as shown in Table 4.3.

Table 4.3: NORMALIZED SCORES PLUS CONSTANTS

#	Programme	MIN-MAX NORMALIZED SCORES + CONSTANT			TZ-SCORE NORMALIZED SCORES + CONSTANT		
		# of Projects	Disbursements	Repayments	# of Projects	Disbursements	Repayments
1	CACS	0.0002547	0.7779356	1.0004731	0.2513492	3.8086946	4.9266664
2	PAS	0.0000092	0.1110611	0.2111061	0.2501480	1.2009810	1.4239523
3	RDF	0.0000012	0.0019172	0.0004731	0.2501089	0.7741904	0.4892954
4	ABP	1.0000012	0.5750090	0.2678756	5.1423712	3.0151801	1.6758598
5	AADS	0.0039865	0.0179712	0.0004731	0.2696062	0.8369670	0.4892954
6	MSMEDF	0.0865201	0.0976635	0.0786438	0.6733822	1.1485919	0.8361680
7	SANEF	0.0000060	0.0071146	0.0019148	0.2501323	0.7945137	0.4956930
8	SMERRF	0.0002419	0.3482901	0.3408651	0.2512867	2.1286297	1.9997409
9	RSSF	0.0000108	0.1927168	0.0511602	0.2501558	1.5202837	0.7142128
10	CIMS	0.0000451	0.2643244	0.0004731	0.2503238	1.8002945	0.4892954
11	TSIF	0.0000172	0.0908492	0.0074566	0.2501870	1.1219457	0.5202840
12	CBIF	0.0000248	0.1162584	0.0004731	0.2502241	1.2213044	0.4892954
13	PAIF	0.0000303	0.3601862	0.4388601	0.2502515	2.1751476	2.4345813
14	NEMSF	0.0000156	0.2192809	0.1588421	0.2501792	1.6241586	1.1920374
15	NBET-PAF	0.0000012	1.0009586	0.0004731	0.2501089	4.6807927	0.4892954
16	NFSP	0.0000024	0.0690205	0.0261545	0.2501148	1.0365876	0.6032535
17	PFI	0.0000080	0.0411859	0.0248029	0.2501421	0.9277447	0.5972557
18	NESF	0.0000060	0.0515806	0.0275062	0.2501323	0.9683914	0.6092513
19	EDF	0.0000012	0.0585103	0.0004731	0.2501089	0.9954892	0.4892954
20	AGSMEIS	0.0088071	0.0972015	0.0009462	0.2931896	1.1467854	0.4913946
21	TCF	0.1269423	0.1730825	0.0004731	0.8711381	1.4435065	0.4892954
22	MAS	0.0000036	0.0076920	0.0139896	0.2501206	0.7967719	0.5492734
23	HSIF	0.0000256	0.0708684	0.0022302	0.2502280	1.0438137	0.4970925
24	YEDP	0.0000275	0.0009586	0.0016220	0.2502378	0.7704418	0.4943935

Source: Authors' compilation

It should be noted that this transformation changed neither the dynamics of the analytical process nor the desirable statistical properties of the series. It was intended to permit the application of geometric mean and improve interpretability of the results since, otherwise, the analysis breaks down with error results in the case of the geometric mean, and negative or zero values in the case of the arithmetic mean aggregation – both outcomes of which are anti-climactic for the purpose of this research exercise.

Making all values positive was followed by the adjustment for size of enterprise financed and age of the programme, the results of which are shown in Table 4.4. Both deflators acted in a compensatory manner on the scores, boosting the scores on programmes targeting smaller enterprises and having shorter durations, while invariably penalizing those financing larger enterprises and having longer durations of existence. This deflation or adjustment effectively addressed concerns over programme lifespan and coverage by further closing the distance between the values.

Table 4:4: ADJUSTED NORMALIZED SCORES PLUS CONSTANTS

#	Programme	ADJUSTED MIN-MAX NORMALIZED SCORES + CONSTANT			ADJSUTED Z-SCORE NORMALIZED SCORES + CONSTANT		
		# of Projects	Disbursements	Repayments	# of Projects	Disbursements	Repayments
1	CACS	0.0000926	0.2828857	0.0909521	0.0913997	1.3849798	0.4478788
2	PAS	0.0000033	0.0403858	0.0191915	0.0833827	0.4003270	0.4746508
3	RDF	0.0000004	0.0006972	0.0000430	0.1250545	0.3870952	0.2446477
4	ABP	0.3636368	0.2090942	0.0243523	1.0284742	0.6030360	0.3351720
5	AADS	0.0014496	0.0065350	0.0000430	0.1348031	0.4184835	0.2446477
6	MSMEDF	0.0314619	0.0355140	0.0071494	0.0961975	0.1640846	0.1194526
7	SANEF	0.0000022	0.0025871	0.0001741	0.1250662	0.3972569	0.2478465
8	SMERRF	0.0000880	0.1266509	0.0309877	0.0251287	0.2128630	0.1999741
9	RSSF	0.0000039	0.0700788	0.0046509	0.0416926	0.2533806	0.1190355
10	CIMS	0.0000164	0.0961180	0.0000430	0.2503238	1.8002945	0.4892954
11	TSIF	0.0000062	0.0330361	0.0006779	0.0625468	0.2804864	0.1300710
12	CBIF	0.0000090	0.0422758	0.0000430	0.0834080	0.4071015	0.1630985
13	PAIF	0.0000110	0.1309768	0.0398964	0.0250251	0.2175148	0.2434581
14	NEMSF	0.0000057	0.0797385	0.0144402	0.0500358	0.3248317	0.2384075
15	NBET-PAF	0.0000004	0.3639850	0.0000430	0.0833696	1.5602642	0.1630985
16	NFSP	0.0000009	0.0250984	0.0023777	0.0625287	0.2591469	0.1508134
17	PFI	0.0000029	0.0149767	0.0022548	0.0833807	0.3092482	0.1990852
18	NESF	0.0000022	0.0187566	0.0025006	0.0500265	0.1936783	0.1218503
19	EDF	0.0000004	0.0212765	0.0000430	0.1250545	0.4977446	0.2446477
20	AGSMEIS	0.0032026	0.0353460	0.0000860	0.0977299	0.3822618	0.1637982
21	TCF	0.0461608	0.0629391	0.0000430	0.8711381	1.4435065	0.4892954
22	MAS	0.0000013	0.0027971	0.0012718	0.1250603	0.3983859	0.2746367
23	HSIF	0.0000093	0.0257703	0.0002027	0.2502280	1.0438137	0.4970925
24	YEDP	0.0000100	0.0003486	0.0001475	0.0625595	0.1926105	0.1235984

Source: Authors' compilation

In the penultimate step of the analysis, the composite indicator series for the development financing interventions of the CBN is calculated for each programme using the arithmetic and geometric mean aggregation methods and the result presented in Table 4.5. The table shows the indicator as derived from four methodologies, namely, min-max geometric, min-max arithmetic, Z-score geometric and Z-score arithmetic. In the min-max geometric indicator series, the ABP, MSMEDF and CACS ranked top three, while the YEDP, EDF and RDF ranked bottom three. In the Z-score geometric indicator series, the corresponding rankings were the TCF-CIMS-ABP and RSSF-NESF-SMERRF.

Table 4.5: Series of Composite Indicators for CBN Devfin Interventions

#	MIN-MAX GEOMETRIC METHOD		MIN-MAX ARITHMETIC METHOD		Z-SCORE GEOMETRIC METHOD		Z-SCORE ARITHMETIC METHOD	
1	ABP	0.12280	ABP	0.19903	TCF	0.85054	TCF	0.93465
2	MSMEDF	0.01999	CACS	0.12464	CIMS	0.60414	CIMS	0.84664
3	CACS	0.01336	NBET-PAF	0.12134	ABP	0.59238	ABP	0.65556
4	SMERRF	0.00702	PAIF	0.05696	HSIF	0.50637	CACS	0.64142
5	TCF	0.00500	SMERRF	0.05258	CACS	0.38416	NBET-PAF	0.60224
6	PAIF	0.00386	TCF	0.03638	NBET-PAF	0.27683	HSIF	0.59704
7	AGSMEIS	0.00214	CIMS	0.03206	PAS	0.25116	PAS	0.31945
8	NEMSF	0.00187	NEMSF	0.03139	EDF	0.24787	EDF	0.28915
9	PAS	0.00137	RSSF	0.02491	AADS	0.23987	MAS	0.26603
10	RSSF	0.00109	MSMEDF	0.02471	MAS	0.23918	AADS	0.26598
11	AADS	0.00074	PAS	0.01986	SANEF	0.23092	SANEF	0.25672
12	TSIF	0.00052	CBIF	0.01411	RDF	0.22794	RDF	0.25227
13	NESF	0.00047	AGSMEIS	0.01288	AGSMEIS	0.18291	CBIF	0.21787
14	PFI	0.00046	TSIF	0.01124	CBIF	0.17692	AGSMEIS	0.21460
15	CIMS	0.00041	NFSP	0.00916	PFI	0.17251	NEMSF	0.20443
16	NFSP	0.00037	HSIF	0.00866	NEMSF	0.15707	PFI	0.19724
17	HSIF	0.00036	EDF	0.00711	NFSP	0.13470	PAIF	0.16200
18	CBIF	0.00025	NESF	0.00709	TSIF	0.13165	TSIF	0.15770
19	NBET-PAF	0.00019	PFI	0.00574	MSMEDF	0.12354	NFSP	0.15750
20	MAS	0.00017	AADS	0.00268	YEDP	0.11420	SMERRF	0.14599
21	SANEF	0.00010	MAS	0.00136	PAIF	0.10984	RSSF	0.13804
22	YEDP	0.00008	SANEF	0.00092	RSSF	0.10794	MSMEDF	0.12658
23	EDF	0.00007	RDF	0.00025	NESF	0.10569	YEDP	0.12626
24	RDF	0.00002	YEDP	0.00017	SMERRF	0.10227	NESF	0.12185
	Quartile cut-off points							
	Upper	0.00257		0.03314		0.24951		0.3043
	Mid/ median	0.00049		0.01349		0.18291		0.2179
	Lower	0.00024		0.00675		0.12760		0.1576

Source: Authors' compilation

There were several areas of convergence, especially with respect to the ABP, CACS and NBET-PAF, all of which were consistently in the top six places in three of the indicator series. These were the programmes with the highest level of activity. The TCF and the CIMS, two COVID-19-era programmes, featured with prominence in the top third of three of the series, despite having been operated for less than a year. Contrarily, the YEDP and the export-oriented programmes were, largely, low in activity relative to others.

As expected, there were divergencies in the rankings arising from the salient differences in the normalization and aggregation methodologies. To meet our end, the series indicators were used to derive the activity series, that is, categorize the programmes by proceeding to sum them up for each programme, and the sums for all the programmes – the final composite index - subjected to ranking on a 5-partition percentile system (Table 4.6). Note the 80th, 60th, 40th and 20th percentile values of 1.05, 0.50,0.40 and 0.30, which partitioned the series into the five categories.

Table 4.6: Activity Series of CBN Devfin Interventions

Programme	Indicators Series				Composite Index	Percentile value/ range/ category
	MGM	MAM	ZGM	ZAM		
TCF	0.01336	0.03638	0.85054	0.93465	1.83	**Remarkably High**
ABP	0.12280	0.19903	0.59238	0.65556	1.57	
CIMS	0.00702	0.03206	0.60414	0.84664	1.49	
CACS	0.01999	0.12464	0.38416	0.64142	1.17	**Upper**
HSIF	0.00214	0.00866	0.50637	0.59704	1.11	**1.05**
NBET-PAF	0.00500	0.12134	0.27683	0.60224	1.01	**High**
PAS	0.00386	0.01986	0.25116	0.31945	0.59	
EDF	0.00041	0.00711	0.24787	0.28915	0.54	**Upper**
AADS	0.00074	0.00268	0.23987	0.26598	0.51	**Middle**
MAS	0.00019	0.00136	0.23918	0.26603	0.51	**0.50**
SANEF	0.00017	0.00092	0.23092	0.25672	0.49	**Moderate**
RDF	0.00010	0.00025	0.22794	0.25227	0.48	
AGSMEIS	0.00052	0.01288	0.18291	0.21460	0.41	**Middle**
CBIF	0.00037	0.01411	0.17692	0.21787	0.41	**0.40**
NEMSF	0.00109	0.03139	0.15707	0.20443	0.39	**Low**
PFI	0.00008	0.00574	0.17251	0.19724	0.38	
PAIF	0.00187	0.05696	0.10984	0.16200	0.33	
SMERRF	0.00137	0.05258	0.10227	0.14599	0.30	**Lower**
NFSP	0.00007	0.00916	0.13470	0.15750	0.30	**Middle**
TSIF	0.00047	0.01124	0.13165	0.15770	0.30	**0.30**
MSMEDF	0.00046	0.02471	0.12354	0.12658	0.28	**Extremely Low**
RSSF	0.00036	0.02491	0.10794	0.13804	0.27	
YEDP	0.00002	0.00017	0.11420	0.12626	0.24	
NESF	0.00025	0.00709	0.10569	0.12185	0.23	

Source: Authors' compilation
N/B: MGM: Min-max Geometric Method; MAM: Min-max Arithmetic Method; ZGM: Z-score Geometric Method; ZAM: Z-score Arithmetic Method

Programmes in the remarkably high activity category are outreach-driven and had attracted the strongest rave reviews in recent times and, in a nutshell, represent the fullness of development finance practice by the CBN. They are generally synonymous with rapid growth and in all indices; accounted for 91.9, 39.2 and 48.0 per cent of outreach, disbursements, and principal repayments, respectively; and span all broad sectors: agriculture (ABP and CACS), industry (CIMS), services (HSIF) and multi-sector (TCF). The CACS is the oldest programme under study. But, notably, in this category are also two programmes of less than a year old, the COVID-19-era TCF for households and MSMEs and the HSIF for the health sector. Both made it into the group due to high intensity outreach and disbursements. Programmes here also received wide embrace because they focused on high employment-elastic activities. For instance, the ABP, which rides on the contract farming model, financed small-scale farmers who constitute a huge proportion of the economically active labour force. It is often argued that there was a substitution effect of the ABP, TCF and CIMS on the Agricultural Credit Guarantee Scheme (ACGS), AGSMEIS and RSSF, respectively, the former three gaining prominence over the latter.

For the high activity category, its relative strength lay in disbursements. They provided 0.3, 25.2 and 8.5 per cent, respectively, of outreach, disbursements, and principal repayments. Representative activities were on-grid electricity power supply services (NBET-PAF), agriculture (PAS, AADS and MAS), and non-oil exports in general (EDF). The pace of expansion of operations in programmes in this group was lower than that for the remarkably high category. The agriculture

interventions PAS and MAS specifically targeted aggregation activities in cereal value chains – rice and maize, respectively. With exception of AADS which was for small-scale primary producers, all programmes were for secondary and tertiary sector SMEs. In general, the low outreach which, in fact, was the lowest for all categories, seemed to symptomize the narrow or restrictive activities of coverage of the programmes. It was, noted, for instance, that despite its oligopolistic structure with implied free entry, existing structural rigidities and high investment costs tended to limit new entrants from obtaining operating licences to access the electricity market. This meant less potential SMEs to reach with available intervention financing, although the NBET-PAF did account for a disproportionately high proportion of disbursements. If there was any substitution effect, that was between NBET-PAF and EDF on the one hand, and NEMSF and NESF on the other hand.

Moderate category interventions covered financial agency services (SANEF), distribution services (RDF), multi-sectoral activities (AGSMEIS) and industry (CBIF). Collectively, they were responsible for 0.7, 4.6 and 0.1 per cent of outreach, disbursements, and principal repayments, respectively. 75 per cent of the programmes here, the highest of such proportion for any category, were implemented by external managing agents, with exception of the RDF. Also, as most of the programmes were introduced at most two years before the COVID-19 outbreak. subsisting moratoria on their facilities were simply extended by the Bank's extension of moratorium on all its intervention facilities. This was most likely the reason for the lowest proportion of repayments recorded among all groups, as uptake was rather slow before then. There appeared to be slow traction in outreach and disbursements for the financial inclusion intervention, SANEF, and the RDF which supports distribution of staple rice. There also seemed to be some substitution between the AGSMEIS and the MSMEDF because of similarity in their focus, making the older MSMEDF wane in significance.

In the fourth or low activity programmes category, the marked features were the high average programme age of six years, high repayments relative to outreach and disbursements, and the absence of a programme financing general smallholder agriculture directly. The NFSP is for large-scale agriculture; NEMSF and PAIF are for services, namely power sub-sector, with the latter also for aviation sub-sector; SMERRF, manufacturing sub-sector in general; and PFI and TSIF for specific manufacturing activities, fertilizer and textile and garments, respectively. Contributions to global outreach, disbursements and principal repayments were 0.03, 23.8 and 37.6 per cent, respectively. These are renowned programmes that have contributed immensely to economic growth and are at advanced stages of implementation, hence are relatively repayments driven. As a matter of fact, the SMERRF was discontinued back in 2014; the only operational activities since then have been monitoring and ongoing repayments which should continue until the longest loan durations elapsed. Most activities covered by the interventions here are not the preponderant type, hence growth in outreach and disbursements is somewhat sluggish. This largely explains the significantly low outreach contribution. As a result, there are no immediately discernible displacements or substitutions to the lower activity category.

The extremely low activity interventions are so described because of their position at the end-2020 milestone relative to their high average age of 5.5 years, implying they are at about mid-age stage, given the conventional ten-year lifespan of most CBN interventions. They contributed 7.1, 7.2 and 5.9 per cent to outreach, disbursements, and principal repayments, respectively. Programmes in this category are all multi-sectoral and they are the MSMEDF, RSSF, the youth-focused YEDP and the export-oriented NESF. Over 99.9 per cent of the 7.1 per cent contribution to disbursements were contributed by the MSMEDF whose huge disbursements were duly discounted, deflated, or penalized, by its seven years of operation to leave it in this category, an indication that, given its age, it should have been better in all indices.

4.2 Policy Implications

The high rankings produced by the COVID-19 era programmes (TCF, CIMS and HSIF) present an apt lesson on what intervention policies should be like. Their rapid uptake (within so short a time frame) was, unequivocally, a product of strong intervention effort (in programme formulation, implementation, and monitoring) and high responsiveness of intended users, i.e., the households and the enterprises. Some programmes were driven by outreach, others by disbursements, some by more than one indicator, etc. What, in turn, drove these indicators? From the findings, preponderance of an economic activity partly drove its outreach. Operating financial profile, reasonably approximated by size of enterprises, influenced disbursements. These indicators and their enablers were critical for success.

For the entire series and within specific categories, some programmes in certain sectors and those aimed at certain economic segments, generally ranked higher than others. In this regard, specific programmes for agriculture (ABP, CACS, PAS), health (HSIF), and power (NBET-PAF, NEMSF) readily ranked better and, to a lesser extent, multi-sectoral, multi-

segment interventions (TCF, MSMEDF). It was obvious that many multi-sectoral programmes did not rank well (MSMEDF, RSSF, YEDP and NESF). Perhaps, this was because these generic programmes lacked the added push of sustained mobilization or clout by apex stakeholder organizations or interested public sector organizations, which programmes with specific focus, such as PAS, MAS, TSIF, NBET-PAF and PFI, for instance, had.

Within specific categories, programmes managed by external parties looked to ranked better than those managed within the CBN. In all four categories (except extremely low category) having a mix of interventions with different management approaches, those overseen by external managing agents ranked better (TCF, NBET-PAF, SANEF, NEMSF). This, by no means, takes the credit off the CBN that has managed programmes such as the ABP, CIMS and HSIF, that are within the topmost, remarkably high activity category, of interventions. Some programmes evidently displaced or substituted others, because either the substituting programmes were more reflective of present-day realities or the substituted interventions were at a less active stage of their life cycle. In the instances of substitutionary relationships, should older programmes be retained in the face of the introduction of the newer? In the winding down substitution instance, what should appropriately constitute the lifespan of especially micro or small borrower programmes? In general, it is instructive that averagely older programmes, fast approaching their sunset, tended to settle into the bottom two groups, that is, low and extremely low categories.

5.0 CONCLUSION AND RECOMMENDATIONS

The study purposed to develop a composite indicator of activity level to establish a broad ranking of CBN development financing programmes, based on cumulative loan disbursements, outreach (loan volumes) and principal repayments. This was used to serialize and characterize these programmes and discover patterns of implementation effort, patronage, and responsiveness of target enterprises to available incentives. It was noted that this exercise was neither an attempt to assess intervention performance or substitute for impact evaluations but an effort to use publicly available information on the financing programmes and tested methodologies to rank the programmes based on activity status. If any of indicators, methodologies, scope, and study period were changed, this could result in completely different outcomes and interpretations.

At the programme onset or initiation stage, there is need to identify all the indicators that will drive a programme and their enablers. Efforts should then be made to frequently report on these indicators and measures designed to emphasize them for greater implementation effectiveness. Since some interventions in specific sectors and economic segments did better, the managers may harness this information to strive towards specialization and increased efficiency. There is need to either refresh older programmes if they are not being wound down or ceded out to be managed by other institutions. The reason for the low ranking of most multi-sectoral programmes should be identified and addressed. Finally, programme life cycles should be monitored and assessed against specified milestones set at programme initiation and the role of regular impact assessment in this respect cannot be over-emphasized.

REFERENCES

African Development Bank (2011). "Enhancing the Contribution of MSMEs to Economic Development: Main Barriers and Possible Interventions". Discussion document, Tunis, March 9.

Central Bank of Nigeria (2020). Central Bank of Nigeria Economic Report. Fourth Quarter, Abuja: CBN. Accessed at https://www.cbn.gov.ng/Out/2021/RSD/Fourth%20Quarter%202020%20Economic%20Report_1.pdf on February 16, 2021.

Cornell University, INSEAD, and World Intellectual Property Organization (2020). The Global Innovation Index 2020: Who Will Finance Innovation? Ithaca, Fontainebleau, and Geneva.

De Muro, P., Mazziotta, M., and A. Pareto (2011). "Composite Indices for Multidimensional Development and Poverty: An Application to MDG Indicators". *Social Indicators Research,* 104(1), 1-18.

Erdin, C. and G. Ozkaya (2020). "Contribution of Small and Medium Enterprises to Economic Development and Quality of Life in Turkey". *Heliyon,* Vol. 6 No. 2. DOI:10.1016/j.heliyon.2020.e03215.

Farrugia, N. (2007). "Conceptual Issues in Constructing Composite Indices", Occasional Papers on Islands and Small States, No. 2, at the International Conference on Small States and Economic Resilience, April 23 – 25, Valletta, Malta.

Global Hunger Index (2020). 2020 Global Hunger Index: One Decade to Zero Hunger: Linking Health and Sustainable Food Systems. Welthungerhilfe, Bonn and Concern Worldwide, Dublin.

Gómez-Limón, J. A., Arriaza, M., and M. D. Guerrero-Baena (2020). "Building a Composite Indicator to Measure Environmental Sustainability Using Alternative Weighting Methods". *Sustainability,* 12(11), 4398. DOI:10.3390/su12114398.

Greco, S., Ishizaka, A., Tasiou, M., and T. Gianpiero (2019). "On the Methodological Framework of Composite Indices: A Review of the Issues of Weighting, Aggregation, and Robustness". *Social Indicators Research,* 141, 61–94. https://doi.org/10.1007/s11205-017-1832-9.

Keskİn, H., Şentürk, C., Sungur, O., and H. M. Kİrİş (2010). "The Importance of SMEs in Developing Economies". 2nd International Symposium on Sustainable Development, June 8 - 9 2010, Sarajevo.

Moreira, S. B., and N, Crespo (2016). "Composite Indicators of Development: Some Recent Contributions". In V. Jeremic, Z. Radojicic M. Dobrota (eds), *Emerging Trends in the Development and Application of Composite Indicators,* 140-162. DOI:10.4018/978-1-5225-0714-7.ch007.

Napoli, M., De Muro, P., and M. Mazziotta (2011). "Towards a Food Insecurity Multidimensional Index (FIMI)". Master in Human Development and Food Security, Università degli Studi Roma Tre.

Obi, J., Ibidunni, A. S., Tolulope, A., Olokundun, M. A., Amaihian, A. B., Borishade, T. T., and P. Fred (2018). "Contribution of Small and Medium Enterprises to Economic Development: Evidence from a Transiting Economy." Data in Brief, Vol. 18, pp. 835 – 839.

Oduntan, K. O. (2014). "The Role of Small and Medium Enterprises in Economic Development: The Nigerian Experience." International Conference on Arts, Economics and Management (ICAEM'14), March 22 – 23, Dubai, 75 – 78.

Opafunso, Z. O. and O. O. Adepoju (2014). "The Impact of Small and Medium Scale Enterprises on Economic Development of Ekiti State, Nigeria." *Journal of Economics and Sustainable Development,* 5(16), 115 – 122.

Organization for Economic Cooperation and Development (2004). "The OECD-JRC Handbook on Practices for Developing Composite Indicators". Paper presented at the OECD Committee on Statistics, June 7 - 8, OECD, Paris.

Organization for Economic Co-operation and Development and the Joint Research Centre (2008). Handbook on Constructing Composite Indicators: Methodology and User Guide. OECD Publishing: Paris.

PricewaterhouseCoopers International Limited (2020). "Building to Last: Navigating MSME Growth and Sustainability in a New Decade". *MSME Survey Nigeria Report*. PricewaterhouseCoopers International Limited.

Saisana, M. (2004). "Composite Indicators – A Review". Second Workshop on Composite Indicators of Country Performance", February 26 – 27, OECD, Paris.

United Nations Development Programme (2018). National Human Development Report: Achieving Human Development in North East Nigeria. Abuja, Nigeria.

United Nations Development Programme (2020). Human Development Report Technical Notes: Calculating the Human Development Indices. Washington, DC.