Asian Journal of Economic Modelling
ISSN(e): 2312-3656
ISSN(p): 2313-2884
DOI: 10.18488/journal.8/2016.4.1/8.1.18.27
Vol. 4, No. 1, 18-27

URL: www.aessweb.com

MONETARY POLICY AND ITS IMPLICATION FOR BALANCE OF PAYMENT STABILITY IN NIGERIA BETWEEN 1986-2015

Bello Malam Sa'idu *Department of Economics and Development Studies, Faculty of Arts and Social Sciences, Federal University Dutse, Jigawa State, Nigeria*

Article History
Received: 16 June 2015
Revised: 15 August 2015
Accepted: 30 August 2015
Published: 26 September 2015

Keywords
Modelling
Future
Composite indices
MDG indicators
MDGs.

JEL Classification:
C43, C82, O1, O53.

ABSTRACT

This paper synthesized Millennium Development Goals (MDGs) progress by modelling future composite indices from the year 2016 to 2020 base on three out-of-sample results of forecasted models; Trend regression, Holt Exponential Smoothing, and Box-Jenkins. It applied a modified version of Malaysian Quality of Life index. The results revealed that there is aggregate progress across MDG composite indices of the models. Comparatively, MDG composite index of Trend regression is the highest among the models, followed by Holt Exponential Smoothing and then Box-Jenkins. The implication is that there is improvement in the aggregate MDG indicators, but the progression is too low or slow symbolizing oscillations not a straight line as assumed by MDG hypothesis. Consequently, more is needed to be done to fast-track MDG achievement. This work has originated Nigerian MDG composite indices computations, provided useful tools for policy analysis and public communications and basis for comparison among countries.

Contribution/ Originality: This paper contributes in providing tools for monitoring MDG progress for use in government agencies. It has also provided the basis for comparison among countries. The study has originated Nigerian MDG composite indices.

1. INTRODUCTION

Generally, the computation of composite index is essential for comparing MDG performance among countries and across the country. It may form the basis for assessing social and economic indicators; socioeconomic comparison between nations; self evaluation of the aggregate trends of the MDGs in order to answer questions like: is the progress of composite index high or low? It can be used to compute urban quality of life index, urban quality of life composite index. Similarly,

state governments should compute urban quality of life composite index, such as; Lagos, Kano, Abuja, etc. Nigeria could use that to measure it progress vis-à-vis other developing countries.

In a study, UNCTAD (2014) noted that, by any historical standard, the progress of the LDCs since 1990 in the areas targeted by the MDGs has been quite remarkable. But only one LDC (the Lao People's Democratic Republic) is on track to meet all of the seven MDGs ……., while the great majority will fail to meet most of them. Only among Asian LDCs are majority on track to meet most of the goals. In addition, (UNCTAD, 2014) opined that, in several other areas, global progress has fallen far short of that required to meet the MDG targets (p.22). In view of the foregoing post-2015 MDG-PLUS agenda is feasible for many countries. There is need to extend the target date.

The empirical paper of Fukuda-Parr *et al.* (2013) enlisted Nigeria among the 20 countries showing highest improvements in 16 MDGs indicators, and rated it among top performers by *absolute pace of progress* in only 5 indicators, using an alternative framework of MDGs benchmarks.

Also, Sumner and Tiwari (2009) opined that the current MDG as a development policy may be extended with another 'MDG-PLUS' agenda after 2015. While, Roberts (2005) argued that, it was implicitly understood by parties to the special Millennium session of the UN General Assembly where the MDGs were adopted that countries facing the greatest difficulties in implementation would fall short of the global targets at the prescribed time limit of 2015. It was intended that they would have picked up momentum and would be on course to reach the targets shortly thereafter. But, can Nigeria get it correctly shortly after 2015? Thus, we assess MDG composite indices up to 2020.

Besides, Agénor *et al.* (2006) used six MDG indicators, to synthesized MDG progress by constructing composite index for Niger base on their projected baseline results, two to five years interval data was used and their work suffers from systematic procedural flaw. Hence, there is need to remedy some of their shortcomings. Therefore, these empirical issues demand a research of this nature. Similarly, it does not appear that MDG office Nigeria or National Bureau of Statistics or Economic Planning Unit had carried out a study on MDG composite index or quality of life by constructing composite indices of Nigeria, comparable to Malaysian Quality of Life index (MQL, 2002). This opens spaces for research to attempt to provide a benchmark for comparing Nigeria with other developing countries. Therefore, the foregoing is practical gap that will contribute to knowledge and practice.

Therefore, the objectives of this paper are; to construct future composite MDG indices; to examine it trend into the year 2020 and to proffer regulator and policy recommendations.

2. LITERATURE REVIEW

The composite index is an old phenomenon originally use in stock markets to measure indexes, but it application into MDG theory has attracted growing research interest, such as; Morris (1979); Sahn and Stifel (2003); Nardo *et al.* (2005); UNDP (2007); Agénor *et al.* (2006); White and Blöndal (2007); Mubila and Pegoue (2008); De Muro *et al.* (2009); Vandemoortele (2009); Easterly (2009); Fukuda-Parr *et al.* (2013) and so on. In their study, Nardo *et al.* (2005) wrote that composite indicators that compare country performance are increasingly recognized as

a useful tool in policy analysis and public communication. They provide simple comparisons of countries that can be used to illustrate complex and sometimes elusive issues in wide ranging fields, e.g. environment, economy, society or technological development. In addition, composite indicators have been identified as useful in benchmarking country's performance and are seen as a starting point for initiating discussion and attracting public interest. Similarly, Vandemoortele (2009) argued that the global MDG canon is dominated by a money- metric and donor-centric view of development and is not ready to accept that growing disparities within countries are the main reason why the 2015 targets will be missed. Also, Easterly (2009) argued that the MDGs are poorly and arbitrarily designed to measure progress against poverty and derivation and that their design makes Africa look worse than it really is. Besides, Sachs (2005) diagnosis is an extension of the UN Millennium Project and the aim is to achieve growth as well as the MDGs through large aid investments, in a 'big push' from the North to the South. Again, Sachs (2008) has ambitiously set out plans for action on climate change, growth, trade, diseases, population and biodiversity based on the experiments in the Millennium Villages pilot projects.

Moreover, Sahn and Stifel (2003) applied asset index of six MDG indicators using linear, log-linear in projecting MDGs progress in Africa and White and Blöndal (2007) used baseline projections of eight MDG indicators across the regions of the World. Also, Agénor *et al.* (2006) applied their macroeconomic framework for monitoring progress towards achieving the MDGs in Sub-Saharan Africa. They narrow down the analysis to Niger only and concentrated on baselines projections of policy experiment. In an attempt to develop MDG index, Mubila and Pegoue (2008) proposed methodology for computing progress composite MDG index. Similarly, De Muro *et al.* (2009) proposed a new and alternative composite index denoted as MPI (Mazziotta-Pareto Index). They applied it to a set of fourteen MDG indicators and present comparison among Human Development Index and Human Poverty Index. The Human Development Index (HDI) is based on the arithmetic mean and it measures the average achievements in a country or geographical area in three basic dimensions: wellbeing (life expectancy); knowledge (adult literacy rate); standard of living (gross domestic product per capital), while, the Human Poverty Index (HPI) constructed by UNDP (2007) measures deprivations. Moreover, De Muro *et al.* (2009) noted that, the measurement of development as multidimensional phenomena is very difficult because there are many theoretical, methodological and empirical problems. The literature of composite indicators offers a wide variety of aggregation methods all having pros and cons. Thus, the proposals by Mubila and Pegoue (2008) should not be relied upon and they are subject to further scrutinizing as well. Therefore, I found MQL (2002) index to be more dependable and more practical. This work used seventeen MDG indicators which is higher than De Muro *et al.* (2009) fourteen MDG indicators.

The MDGs originally consist of eight goals, eighteen targets and forty-eight indicators. There are series of eight time-bound development goals that seek to address issues of poverty, education, equality, health and environment, to be achieved by the year 2015. They were agreed by the international community at the United Nation's millennium summit, held in New York in September 2000. One hundred and eighty nine member states of the United Nations, including

Nigeria, pledged to make concerted efforts to address problems relating to poverty, education, gender equality, health, environment and global partnerships for development.

3. METHODOLOGY OF MDG COMPOSITE INDICATOR

In the methodology, seventeen MDG indicators were used, namely; poverty rate, child malnutrition, net enrolment in primary, primary school completion rate, gender parity index, women in parliament, infant mortality rate, children immunization rate, maternal mortality rate, HIV prevalence, TB prevalence, carbon dioxide emissions, access to safe water, debt service ratio, youth unemployment rate, personal computers, and internet users to construct MDG composite index to synthesize aggregate progress of MDGs in Nigeria 2020. The data used is the results of out-of-sample forecast of three models from 2016 to 2020. The data details have been provided by Ali (2010). Thus, composite index of each forecasting model: Trend Regression, Holt's exponential smoothing (Holt, 1960) and Box-Jenkins Box George and Jenkins Gwilym (1970) are computed and weighted so as to determine aggregate progress of MDGs. Thus, a rise in the composite index denotes improvement and a fall indicate no improvement. This allows us to construct three different composite indexes and makes it easier to compare them. In order to construct the composite indices, we first obtain the standard score, which consist of standard deviation. Hence, to enable the units in the indices to be comparable, standardization of the data is needed through track record achieved by each indicator. Consequently, standardizing each indicator requires standard deviation method, so as to obtain aggregation for the derivation of the composite index. Moreover, the standard deviation enables the determinations of the location of the values of frequency distribution in relation to the mean with greater accuracy. Composite indices are developed as weighted sum of scores of the country for each indicator, the weight being the percentage of the variation explained by the indicators.

The following equations explain the weighting procedure;

a) The first procedure is to obtain the standard score and the formula is given as:

$$A_{ij}^{k} = \frac{Xyi - Xyo}{\sigma} \qquad (1)$$

Where: X_{yi} = value of indicator in year i; X_{yo} = value of indicator in base year;

σ = standard deviation of the data series; A = standard score; K= indicators of MDGs; i= year, i.e. 2016, 2017……..n; j= country, in our case, Nigeria.

Table-1. Normalization Methods

S/N	Name of Technique	Indexation Technique	Equations
1.	Standardization (or z-scores)	$S_{ij}^{t} = [X_{ij}^{t=1,\ldots n} - X_{ij}^{t0}] \div \sigma_{ij}^{t0}$	(1)
2.	Normalizing signs a) Positive b) Negative	 $Q_{ij}^{t} = 100 + (S_{ij}^{t} * 10)$ $Q_{ij}^{t} = 100 - (S_{ij}^{t} * 10)$	 (2) (3)
3.	Weighting	$MCI_{ij}^{t} = \sum_{ij}^{t} Q \div n_i$	(4)

Note: This is a modified version of Malaysian Quality of Life index

Where;

MCI_{ij}^{t} = raw value of MDG composite index $i_{1,2,\ldots 17}$ at year $t_{2016,\ldots 2020}$.

$\sum_{ij}^{t} Q$ = summation of raw value of sub-index $i_{1,2,\ldots n}$ at year $t_{2016,\ldots 2020}$.

n_i = number of indicators of MDGs.

S_{ij}^{t} = standard score of indicators $i_{1,2,\ldots 17}$ at year t $t_{2016,\ldots 2020}$.

X_{ij}^{t0} = raw value of sub-indicators $i_{1,2,\ldots n}$ at base year t_{2016}.

$X_{ij}^{t=1,\ldots n}$ = raw value of sub-indicators $i_{1,2,\ldots n}$ at subsequent years.

σ_{ij}^{t0} = standard deviation of the data series for all sub-indicators $i_{1,2,\ldots n}$ at year to (constant).

$t_{2016,\ldots 2020}$

b) The second procedure is to normalize the indicators since some are positive while others negative. Thus, the formula for positive indicators is:

$$B_{ij}^{k} = 100 + (A_{ij}^{k} * 10) \quad (2)$$

Whereas, the formula for negative indicators is:

$$B_{ij}^{k} = 100 - (A_{ij}^{k} * 10) \quad (3)$$

The last procedure to compute this weighting is given as;

$$C_{ij}^{MDGs} = \sum_{k} Bij \div ni \quad (4)$$

Where; MDGs = composite index; Bij = is the sub-index of each MDG indicator k in year i for country j; n = number of indicators of MDGs; Cij = year i for country j.

This tactful procedure is summarized in Table 1 above, and is a modification from Malaysian Quality of Life index (MQL, 2002). Consequently, we can present equations for computing MDG composite index in Table 1, titled 'Normalization Methods'. The first equation is for standard score, while the second, is for normalizing signs of each indicator consisting of two equations—positive indicators and negative indicators.

The last equation deals with overall weighting that produces MDG composite index. Furthermore, the standard deviation and standard score are based on the mathematical theory that now have become a grounded mathematical law, for instance; Sir Francis Galton discovered the standard deviation; Karl Pearson was the first to used the concept 'standard deviation' in his lectures, although it has been used previously by German scientist and mathematician, Carl Friedrich Gauss as 'mean error'.

4. RESULTS OF COMPOSITE INDICES, 2016–2020

To determine aggregate progress of all the MDG indicators up to 2020, we construct MDG composite indices out of sample in accordance with the model forecasts to synthesis aggregate progress of MDGs in Nigeria by 2020. Thus, a rise in any composite indicator denotes improvement and a fall indicate no improvement. The Composite Index of each forecasting model were obtained after thorough computation and weighting, guided by conventional procedure.

The result of MDG composite indicator for Trend Regression is given in Table 2. It shows improvement from base year 2016 of 100 to 102.30 in 2017, and 104.27 in 2018. Progress nearly double from previous year at 4.27 points (104.27). It continue improving from 106.12 with 6.12 points in 2019 to 107.34 (7.34 points) in 2020, which is higher than all the points before it. In

comparison to other indices, this composite index crest the other two indices (Holt's and Box-Jenkins), throughout the years 2017-2020 (see Figure 1) for pictorial clarification.

The result of MDG Composite indicator of Holt's Exponential smoothing is presented in Table 3. This index demonstrated progress from the base year of 100 in 2016 to 101.45 (1.45 points) improvement in 2017, which is less than Trend Regression when compared. The situation is more than double in 2018 with 103.55 (3.55 points). It improve further to 105.46 (5.46 points) in 2019 and finally improve to 107.28 (7.28 points) in 2020. Thus, this composite index signifies that it lag behind Trend Regression Composite Index from 2017 to 2020, but higher than Box-Jenkins model index. One will rightly say that it occupies a middle position between the indices, even though it will slightly coincide with Trend index in the year 2020 (Figure 1) for pictorial exposition.

The result of MDG composite Indicator of Box-Jenkins model is demonstrated in Table 4. At first, this index is expected to improve by 2017 by 101.02 (1.02 points), but it will be less than it counterparts models. It keeps the low momentum from 102.15 (2.15 points) in 2018 to 103.21 (3.21 points) in 2019. Lastly, it may reach 103.84 (3.84 points) in 2020 with just a slight improvement of 0.63 point over 2019. This composite index lags behind the previous two indices throughout the years 2017 to 2020. Also, the pictorial exposition is demonstrated in Figure 1.

Table-2. MDG Composite Indicator, Trend Regression Results for 2016-2020

	Predictions				
Indicators	**2016**	**2017**	**2018**	**2019**	**2020**
Poverty rate (% of the population living < $1 per day)	54.70	55.18	55.67	56.12	56.49
Child malnutrition (% of underweight < 5 years of age)	30.34	30.45	30.52	30.51	30.46
Net enrolment in primary (ratio in primary education)	73.00	73.82	74.65	75.49	76.34
Primary School completion rate (Grade six completion)	65.66	65.62	65.59	65.56	65.54
Gender parity index (% of girls to boys in primary)	92	92	93	94	94
Women in parliament (% of seats held by women)	18.19	20.37	22.82	25.56	28.62
Infant mortality rate (<5yrs old per 1000 live births)	111.1	111.2	111.2	111.2	111.3
Children immunized (% of one year old child, measles)	52.22	51.80	51.45	51.15	50.89
Maternal mortality rate (per 100,000 live births)	1096.5	1097.3	1098.0	1098.5	1098.8
HIV prevalence (% of population aged 15-49)	3.023	3.018	3.013	3.009	3.005
TB prevalence (per 100,000 people)	479.6	476.6	473.7	471.0	468.2
Carbon Dioxide Emissions (per thousand metric tons)	68965.7	68095.5	67364.0	66748.0	66228.6
Access to safe water (% of population with safe water)	48.57	48.58	48.58	48.58	48.58
Debt Service Ratio (as % of exports)	2.61	2.41	2.23	2.06	1.90
Youth unemployment (% of labour force unemployed)	32.19	35.64	39.46	43.71	48.42
Personal Computers (per 100 people)	1.45	1.53	1.61	1.70	1.79
Internet users (per 100 people)	12.49	13.12	13.76	14.40	15.04
COMPOSITE MDG INDICATOR (2016=100)[a] (A rise denotes an improvement)	100.00	101.02	102.15	103.21	103.84

Note: Author's computation.
a = is a weighted index of all indicators.

We can infer from the foregoing that there is progress towards achieving the MDGs, but the progression across aggregate MDG indicators is low symbolizing oscillations not straight line as assumed by MDG hypothesis. This result is consistent with the submission of Easterly (2009) that measuring social and economic progress is not at all as straight forward as the discussion of the MDGs makes it seem. The work is also in line with MQL (2002). Also the works of Agénor *et al.* (2006) and White and Blöndal (2007) are on scenario projections which are similar to this study that utilises forecasted data to compute the MDG composite indices. The study of Sahn and Stifel (2003) is dissimilar to this work on the basis of their asset index model. Also, Mubila and Pegoue (2008) is different from this work on methods and it is still on proposal stage.

Table-3. MDG Composite Indicator, Holt's Model Results for 2016-2020

	Predictions				
Indicators	**2016**	**2017**	**2018**	**2019**	**2020**
Poverty rate (% of the population living below $1 per day)	63.92	65.49	66.67	67.58	68.29
Child malnutrition (% of underweight children <5 years of age)	27.6	27.6	27.42	27.28	27.14
Net enrolment in Primary (Net enrolment ratio)	72.4	73.1	73.8	74.5	75.2
Primary School completion rate (Grade six completion rate)	80.56	81.36	82.17	82.98	83.8
Gender Parity Index (% of girls to boys in primary enrolment)	92	92.2	93	93.6	94.4
Women in parliament (% of seats held by women)	11.3	11.85	12.38	12.92	13.45
Infant mortality rate (of children <5yrs old per 1000 live births)	56.4	54.1	51.9	49.7	47.7
Children Measles Immunized (% of one year old child immunized)	51.41	51.96	52.56	53.17	53.78
Maternal mortality rate (per 1,000 live births)	640.2	620.3	601.3	582.8	564.9
HIV prevalence (% of population aged 15-49 living with HIV)	2.4	2.5	2.57	2.65	2.72
Tuberculosis prevalence rate (per 100,000 people)	909.1	947.8	988.6	1031.2	1075.7
Carbon Dioxide Emissions (per thousand metric tons)	174540	184854	195780	207415	219743
Access to safe water (% of population with access to safe water)	56	55.8	55.6	55.4	55.2
Debt Service Ratio (as % of exports of goods and services)	1.5	1.2	0.95	0.7	0.47
Youth unemployment rate (% of labour force unemployed)	37.6	42.3	47.5	53.4	60
Personal Computers (per 100 people)	1.15	1.18	1.21	1.24	1.27
Internet users (per 100 people)	10.2	10.8	11.4	12.0	12.6
COMPOSITE MDG INDICATOR (2016=100)[a] (A rise denotes an improvement)	100.00	101.45	103.55	105.46	107.28

Note: Author's computation.
a = is a weighted index of all indicators.

Table-4. MDG Composite Indicator, Box-Jenkins Models Results for 2016-2020

	Predictions				
Indicators	**2016**	**2017**	**2018**	**2019**	**2020**
Poverty rate (% of the population living < $1 per day)	54.70	55.18	55.67	56.12	56.49
Child malnutrition (% of underweight < 5 years of age)	30.34	30.45	30.52	30.51	30.46
Net enrolment in primary (ratio in primary education)	73.00	73.82	74.65	75.49	76.34
Primary School completion rate (Grade six completion)	65.66	65.62	65.59	65.56	65.54
Gender parity index (% of girls to boys in primary)	92	92	93	94	94
Women in parliament (% of seats held by women)	18.19	20.37	22.82	25.56	28.62
Infant mortality rate (<5yrs old per 1000 live births)	111.1	111.2	111.2	111.2	111.3
Children immunized (% of one year old child, measles)	52.22	51.80	51.45	51.15	50.89
Maternal mortality rate (per 100,000 live births)	1096.5	1097.3	1098.0	1098.5	1098.8
HIV prevalence (% of population aged 15-49)	3.023	3.018	3.013	3.009	3.005
TB prevalence (per 100,000 people)	479.6	476.6	473.7	471.0	468.2
Carbon Dioxide Emissions (per thousand metric tons)	68965.7	68095.5	67364.0	66748.0	66228.6
Access to safe water (% of population with safe water)	48.57	48.58	48.58	48.58	48.58
Debt Service Ratio (as % of exports)	2.61	2.41	2.23	2.06	1.90
Youth unemployment (% of labour force unemployed)	32.19	35.64	39.46	43.71	48.42
Personal Computers (per 100 people)	1.45	1.53	1.61	1.70	1.79
Internet users (per 100 people)	12.49	13.12	13.76	14.40	15.04
COMPOSITE MDG INDICATOR (2016=100)[a] (A rise denotes an improvement)	100.00	101.02	102.15	103.21	103.84

Note: Author's computation.
a = is a weighted index of all indicators.

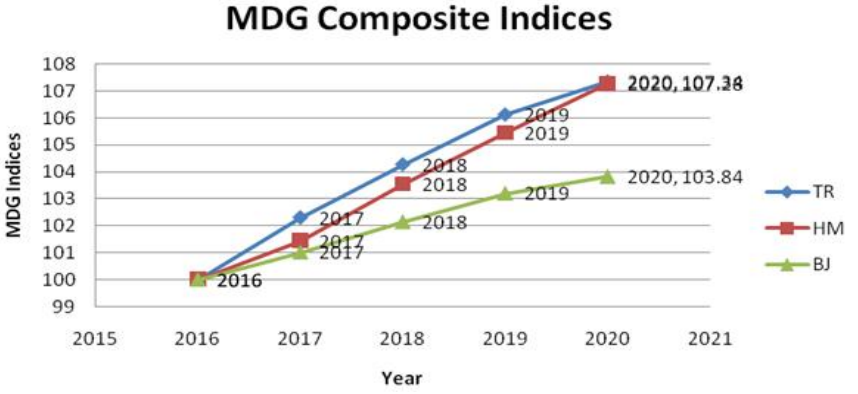

Figure-1. MDG Composite indices, 2016–2020

5. CONCLUSIONS AND POLICY RECOMMENDATIONS

In conclusion, there is going to be progress on MDG indicator up to the year 2020, but the progression across aggregate MDG indicators is low symbolizing oscillations not straight line as assumed by MDG hypothesis. Therefore, this study has provided essential findings on MDGs progress in Nigeria which can serve as a benchmark for assessing and comparing Nigeria's MDGs indicators progress among its peers (across developing countries) in a form of MDG composite indices.

Another methodological improvement is on MDG indexation, the three MDG composite indices that were computed for Nigeria, out-of-sample MDG composite in line with the forecast of the three models and as extension of Agénor *et al.* (2006) composite index for Niger as well as modification of Malaysian quality of life index (MQL, 2002). It is therefore recommended that, MDG institutions in Nigeria should provide database on MDG indicators to pave way for composite index analysis and more exploration of the variables.

The MDG office Nigeria, which is the regulatory body of MDGs in the country is headed by the Senior Special Assistant to the President on Millennium Development Goals (SSAP-MDGs). Therefore, the results of this work are of interest to the MDG institutions and MDG office Nigeria who are confronted with multi-dimensional decision and daunting challenges. The research findings present important grounds for formulating policy and evaluating MDG progress via composite indices which will go a long way in guiding MDG institutions in their quest to achieve the MDG targets. Thus, it is recommended that, MDG institutions should ensure projects and programs are efficient and reach the intended target group.

Given the importance of MDG composite indices for the measurement of social and economic progress, it is therefore recommended that, MDG office Nigeria should train staff and work on composite indices analysis of all the MDG indicators. This will go a long way in improving performance tracking on the goals. It will surely help in fast track the indicators. Government and MDG institutions should organize workshops in localities to strengthen localization of MDG in villages and local communities. Also, this study has provided development practitioners and international agencies with insights on MDG composite indexation. Another significant regulatory and policy contribution is that, the research findings impliedly are expected to stimulate discussions and reawaken government to its endorsed commitment (United Nations, 2000) as well as international partners and agencies will be ignited on the matter.

Finally, future research should focus on constructing MDG composite indices of the entire forty-eight MDG indicators of any country and comparative analysis among countries. It has also provided additional information to future researches that are into constructing composite indices.

Funding: This study received no specific financial support.

Competing Interests: The author declares that there are no conflicts of interests regarding the publication of this paper.

Contributors/Acknowledgement: This paper by Dr. Bello Malam Sa'idu (formerly known as Dr. Bello Malam Ali) is an attempt to publish some part of his PhD Thesis; interestingly it has not appeared previously in this form. The author is thankful to the supervisor, Prof. Roslan Abdul Hakim and his colleagues at Universiti Utara Malaysia.

REFERENCES

Agénor, P., B. Nihal, P.M. Emmanuel and E.A. Karim, 2006. Achieving the Millennium development goals in Sub-Saharan Africa: A macroeconomic monitoring framework. The World Economy, 29(11): 1519-1547.

Ali, B.M., 2010. An economic analysis of poverty, inequality and future of millennium development goals in Nigeria. Unpublished PhD Thesis, of Universiti Utara Malaysia.

Box George, E.P. and M. Jenkins Gwilym, 1970. Time series analysis: Forecasting and control. San Francisco: Holden-Day.

De Muro, P.D., M. Mazziotta and A. Pareto, 2009. Composite indices for multidimensional development and poverty: An application to MDG indicators. Available from Paper_3_b2_DeMuro-Mazziotta-ParetoMeasuringprogresstowardsMDGs.pdf.

Easterly, W., 2009. How the millennium development goals are unfair to Africa. World Development, 37(1): 26-35.

Fukuda-Parr, S., J. Greenstein and D. Stewart, 2013. How MDG success and failure should be judged: Faster progress or achieving the targets? World Development, 41(1): 19 – 30.

Holt, C., 1960. Planning production, inventories, and work force. Englewood Cliffs, N.J: Prentice-Hall.

Morris, M.D., 1979. Measuring the condition of the world's poor: The physical quality of life index. New York: Pergamon Press.

MQL, 2002. Malaysian quality of life, Kualiti Hidup Malaysia, economic planning unit, prime minister's department, Malaysia. Kuala Lumpur: Percetakan Nasional Malaysia Berhad.

Mubila, M. and A. Pegoue, 2008. Toward a methodology for computing a progress composite MDG index. The African Statistical Journal, 7(11): 60 - 72.

Nardo, M., M. Saisana, A. Saltelli, S. Tarantola, A. Hoffman and E. Giovannini, 2005. Handbook on constructing composite indicators: Methodology and user guide, OECD statistics working paper. Paris: Organisation for Economic Co-operation and Development.

Roberts, J., 2005. Millennium development goals: Are international targets now more credible. Journal of International Development, 17(1): 113–129.

Sachs, J., 2005. The end of poverty: How we can make it happen in our lifetime. London: Penguin.

Sachs, J., 2008. Common wealth. London: Penguin.

Sahn, D.E. and D.C. Stifel, 2003. Progress toward the Millennium development goals in Africa. World Development, 31(1): 23–52.

Sumner, A. and M. Tiwari, 2009. After 2015: What are the ingredients of an MDG-PLUS Agenda for poverty reduction? Journal of International Development, 21(6): 834–843.

UNCTAD, 2014. United Nations Conference on Trade and Development. The Least Developed Countries Report, UNCTAD/LDC/2014, United Nations Publications.

UNDP, 2007. Human development report 2007/2008. Torino: Rosenberg & Sellier.

United Nations, 2000. Millennium declaration. 5. Available from www.un.org/millennium/declaration/ares552e.pdf.

Vandemoortele, J., 2009. MDG conundrum: Meeting the targets without missing the point. Development Policy Review, 72(4): 355-371.

White, H. and N. Blöndal, 2007. Projecting progress toward the millennium development goals. United Nations university, world institute for development economic research (UNU-WIDER). Research paper N0. 2007/47. Available from http://mpra.ub.uni-muenchen.de/5687/.