Medium Term Expenditure Framework (MTEF): A Panacea for Public Expenditure Management (PEM) In Nigeria?

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Abstract

This paper investigated the outcome of the adoption and implementation of Medium-term Expenditure Framework (MTEF) in the Nigeria budgeting process. MTEF is eulogized by the World Bank, and even donor organization DFR as the panacea to the poor public expenditure management (PEM) prevalent in most of sub – Sahara African Countries. MTEF was first adopted in Nigeria, following the passage of the Fiscal Responsibility Act 2007 Act 30 to guide her national annual budgeting process. Using simple statistical methods, we collated data from sixteen national budgets (2003 - 2016), and constructed statistical tables to investigate the MTEF in the Nigeria annual budgets. Using correlation coefficient, we examined the behaviour of three key fiscal and expenditure items in Nigeria annual budgets.

Our findings showed strong positive correlation between the budgeted and actual figures in all three fiscal items. Oil production was negatively corrected with the actual. We concluded, following our findings that the adoption and implementation of MTEF has to a large degree improved fiscal discipline in the Nigeria budgeting process.

Keywords: Medium Term Expenditure Framework, (MTEF), Fiscal Responsibility Act 2007, Oil revenue, Benchmark Oil Price, oil production, oil revenue, Recurrent Expenditure, Capital Expenditure, Aggregate Expenditure, Public Expenditure Management (PEM), Fiscal Policy

1. Introduction

Nigeria adopted the Medium Expenditure Framework (MTEF) into her budgeting process following the passage of the Fiscal Responsibility Act 2007 Act No 31 (hereafter FRA) of 2007. PART II of the Act out rightly prescribed the adoption of the MTEF in the national budgeting process. "The Federal Government, after consultation with the states shall …… caused to be prepared and laid before the National Assembly for their consideration a Medium-Term Expenditure Framework." In Sub-Sahara Africa, the adoption of MTEF followed a trend of reforms of budgetary and fiscal management programs embarked upon by a number of African countries in the 1990s. These reforms which according to Allen and Evans (2017), appeared to have been driven by external pressure from the World Bank, donor organizations, creditor nations and the international financial community in generally. The believe exits in these organizations that most of Sub Sahara African Nations have endured several years of chronic poor public expenditure management (PEM). This, according these organization, have inadvertently resulted in increased poverty in Sub-Sahara Africa countries.

Currently, over thirteen African nations including Ghana, Malawi, Uganda, South Africa, Egypt, Kenya Namibia, Nigeria etc. are at different stages in the adoption and implementation of MTEF. South Africa and Uganda are ahead of the other African nations in the adoption of MTEF. Nigeria implemented her first MTEF in 2011 budgeting process. To date Nigeria has prepared and laid before the National Assembly several METFs: 2010 – 2012, 12- 15, 16 – 18, 17- 19, 18 – 22 and currently had prepaid the 2020 MTEF and submitted to the National Assembly. As Allen, R. et. (2017) puts it, "The question remains whether the introduction of MTBFs—which, appears to have been substantially driven by external pressures from the development partners has achieved its desired objectives, and whether the initial benefits received have been sustained".

Therefore, the fundamental thesis of this paper is the argument that national annual budgets situated within the context of the medium-term expenditure framework (MTEF), will drastically improve public expenditure management by aligning available resources with national policy priorities which will in turn enthrone fiscal discipline. Therefore, our main

objective in this paper is to assess the extent of the success or otherwise of the adoption of MTEF in addressing the problem of fiscal disciple in the Nigeria budget performance. This is against the backdrop of the main purpose of adopting an MTEF - to improve the budgeting process, aligning the resources envelope with fiscal policy priorities in the medium term, and to alleviate poverty resulting from poor public expenditure management. The appeal of MTEF lies in its potential ability to link competing short-term imperatives of macroeconomic stabilisation with the medium and long term demands on the budget to contribute to improve policy making, planning, and contribute to the efficiency and effectiveness of service delivery.

For purposes of clarity and ease of understanding, this paper is structured as follows. Section II conceptualizes, discuses and review current MTEF literature. Section III describes the methodology adopted in the paper. the historical development of MTBFs in the SSA region. Section IV sets out an empirical analysis of macroeconomic and fiscal forecasting performance,

2. Conceptualization of MTEF

The World Bank's Public Expenditure Management Handbook (1998), conceptualizes MTEF as consisting "of a top-down resource envelope, a bottom-up estimation of the current and medium-term costs of existing policy and, ultimately, the matching of these costs with available resources... in the context of the annual budget process." The "top-down resource envelope" is fundamentally a macroeconomic model that indicates fiscal targets and estimates revenues and expenditures, including government financial obligations and high cost government-wide programs such as civil service reform." Petkova (2009) says, "It represents a set of broad principles for sound budgeting that are implemented in different ways in different institutional settings. Indeed, this sensitivity to institutional setting is a crucial component of the design of a successful MTEF." Holmes and Evans (2003) conceptualize MTEF as, "an annual, rolling three year-expenditure planning …. that sets out the medium-term expenditure priorities and hard

budget constraints against which sector plans can be developed and refined."

This paper accepts all three views, but prioritizes the definitions by Petkova *(ibid)* and Holmes and Evans. Following Holmes and Evans (ibid), MTEF also has outcome criteria as performance monitoring standards. These authors stated that a fully functioning MTEF has the following characteristics: - policy proposal is considered in the medium to long term. Decision about policy reflects only what is affordable and implementable over the medium to long term. Costs are estimated forward to cover existing policies, programmes and activities over the medium term. A clear relationship exists between forward cost estimates of expenditures and the annual budget of the nation concerned. Finally, the annual budget, is framed in a medium-term context, it reflects what is affordable with available resources – the top down resources envelop

2.1 Discussion

Following Grigoli, Mills, Verhoeven and Vlaicu (2017), there are three phases in the adoption and implementation of an MTEF. First is the Medium -Term Fiscal Framework (MTFF). In this phase, the aggregate resource envelope is established. Another feature of this phase includes the availability of a macro-fiscal strategy, macroeconomic and fiscal forecasts, and debt sustainability analysis *(bid)*. The second phase is the Medium-Term Budget Framework (MTBF) – this phase focuses on accurate allocation of resources across sectors, programs and agency. Aggregate and sectorial spending objectives are explained.

Finally, is the Medium-Term Performance Framework (MTPF) which requires spending agencies to list specific program output. The formulation of a Medium-Term Fiscal Framework (MTFF) is the starting point in the adoption of an MTFF. MTFF provides the aggregate resource envelope of the fiscal policy objectives, macroeconomic assumptions and projections for the next three or four years, depending on the MTEF tenor. In Nigeria, the MTFF is expressed in the Fiscal Strategy Paper (FSP). For instance, in the 2011 budget, the first in the 2011 – 2013 MTEF, the Fiscal Strategy Paper stated that a large proportion of spending will be directed at booting infrastructure (including power) development, agriculture, manufacturing etc. Aggregate resources envelope was N5.18tr in 2015 as against N4.8t in 2012.

The adoption of MTEF stipulates the implementation of MTBF - the top down budgeting approach which sets expenditure ceilings from top to bottom by the Ministry of Finance (Petkova, 2009, Zaman and Gebeity 2014). Nigeria is yet to adopt the MTBF given its content requirement in the MTEF scheme. Currently the country still runs the traditional incremental annual budgeting system, which follows the bottom up approach to budgeting (Igbuzor 2015). The annual budget cycle does not envisage future costs and benefits. It's starting point is the precious year's budget modified in an incremental manner. This makes it difficult to repriroritize policies and spending. With this approach, planning is based on existing income and expenditure as the deciding factor in national planning levels. Revenues are projected on the basis of expected inflows from available resources: taxes and non- taxes income and borrowing capacity. Nigerian MTEF for 2012 – 2015, projected crude oil sales price at an average of $75, per barrel, exchange rate 150/US$. The non-oil revenue was similarly

estimated.

Finally, the Medium-Term Performance Framework (MTPF) which measure and evaluates outputs and outcomes of the spending programs (Allen, et al. 2017). MTPF reinforces an important characteristic of MTEF – a resource usage evaluation tool as its emphasis value for money in public sector spending and seeks to link budgetary policies from inputs to outputs (Zaman and Gebeity 2014). Medium-Term Performance Framework (MTPF sets sectoral performance targets. The adoption of the MTEF in Nigeria also specifies a Macro-Economic Framework (MEF) that sets out amongst others: - a macroeconomic projections for the next three financial years. It equally recommends that the underlying assumptions for the macroeconomic projections be thoroughly evaluated and analyzed. The macroeconomic framework deals with recent development and prospects of Nigeria in the global market place, in particular as it relates to the global crude oil market. Furthermore, it reviews country specific macroeconomy especially those of Nigeria trading partners in the global crude oil market.

2.2 Review of Literature

MTEF presents a general theory of public expenditure management (PEM). It's architect and main proponent, the World Bank states, "Failure to link policy, planning and budgeting may be the single most important factor contributing to the poor budgeting outcomes at the macro, strategic and operational levels in developing countries". The fragmentation of key public expenditure process: policy making, planning and budgeting reduces the annual budgeting process to a mere resources allocation project. "Budgets are treated as an annual funding exercise." The MTEF harnesses all three key processes realized in the three frameworks: Medium Term Fiscal Framework (MTFF), Medium Term Budget Framework (MTBF) and Medium-Term Performance Framework (MTPF). Since "expenditure depends on policy" (*Disraeli* 1862 cited by World Bank 1998), therefore policy should be driven by national priorities and disciplined by budget realities – resource availability.

Petkova (2009), stated that MTEF is adopted in many countries because, "it is seen as particularly useful as a means of mapping national priorities set out in Poverty Reduction Strategy Papers (PRSPs), into government budgets". This She said, follows the, "realisation that the annual approach to budget making actually undermines budgetary performance, contributeses to fiscal instability and, perhaps even more fundamental, to resource misallocation and the inefficient and ineffective use of resources." These failures recommended the adoption of MTEF to Nigeria in 2011. Like most other countries, the passage of the fiscal Responsibility Act 2007, was as a result of the inadequacy of current fiscal discipline, especially with increasing budget deficits resulting from the annual budgeting cycle approach. Oluba (2008) drew attention to the "addiction of Nigeria governments to fiscal deficits since the early days of independence. This according him, has "emasculated the Nigeria economy." Oluba concluded that how deficits are financed, determines its effects on the performance of the economy.

PetKova's reasoning captures the essence of Grigoli, Mills, Verhoeven and Vlaicu's, (2012), argument, that MTEF is designed to overcome, "the dynamic fiscal inefficiencies", particularly those noticed in a yearly budget cycle planning and implementation. This could take the form of "electoral manipulation through budget cycle" (Drazen 2000 and Brender and Drazen 2005) cited by Grigoli, Mills, Verhoeven and Vlaicu, (2012). Besides, annual budget uses the "bidding system" which though has the merit of decentralizing the budget preparation responsibility to the agency responsible for budget execution, it has been criticized on several grounds. For instance, the bidding system naturally fails to review the base budget.

Earlier works in public expenditure management were by scholars like Adolph Wagner (1835 – 1917) – *Law of Increasing State Activitie*s and Wiseman – Peacock (1890 – 1955) cited by Bhatia. Wagner hypothesized that, "government at whatever level (national or sub-national) has the inherent tendencies to expand it activities". "It is the intensity and extensity of government activities tending to grow faster than the economy as a whole that brings about increased government spending." Wagner's seminal work included nothing on managing the increasing government spending at all levels which is the bidding budget system. Bhatia noted, "Wagner based his work on historical facts, as such contains no quantitative relationship between the increase in public expenditure and the time it takes".

Wiseman – Peacock (1890 – 1955) theory of public expenditure, cited by Bhatia (2010) basically argued, *"public expenditure does not increase in a smooth and continuous manner, but in jerks or steplike fashion"*. It explained "*the jerks and steplike fashion"* in public expenditure as the result of unforeseen incidences - "social disturbance" that take place in the macroeconomy. These, going by Wiseman – Peacock thesis, impact public expenditure, making it undulating and not continuous in a straight-line fashion. The Wiseman – Peacock thesis, by and large captures the reality in Nigeria public expenditure pattern. For instance, the high rate of unemployment in Nigeria has, at different points in time, made different Governments embark on social employment schemes to ameliorate the hardship experienced by the unemployed. For example, between 2012 and 2015 there was the *Sure-P* - the Subsidy Reinvestment and Empowerment Program directed at creating employment for youths. From 2016 to date is the *N-Power* social employment program which is focused on

large-scale skill development programs. These programs address challenges of youth unemployment and create social disturbance which makes public expenditure in Nigeria go jerks and follow a step like fashion. Zaman and Gebeily (2014), are of the opinion that, MTEF can be functional only if there is synergy between, "budgetary users in elaborating strategic goals within the overall government strategy". These authors built the concept of MTEF around three fundamental frameworks – medium term fiscal framework (MTFF), medium term budgetary framework (MTBF) and medium-term performance framework (MTPF). Because of the complexity of MTEF, Zaman and Gebeily (bid) recommended its implementation be gradually over the course of several years.

Holmes and Evans (2003) identified three different stages in MTEF adoption and development: *maturing, getting together and struggling*. South Africa and Uganda are identified as haven reached the maturing stage in the adoption and development of MTE. In either of these countries, "the MTEF has become the basis of annual budget preparations and the mechanism for disclosing resource and expenditure projections to the legislature". Uganda has even gone ahead to "forged a close link between the MTEF and the Poverty Eradication Action Plan (the basis for Uganda's PRSP)". Judged by these criteria, one could safely assume that Nigeria is only at the stage of "*getting together*" her adoption and implementation of MTEF, given that Nigeria is yet to implement the MTBF. Besides, Nigeria still runs separate poverty alleviation programs (NAPEP, SURE – P, Anchor – Borrower etc.) from the annual budgets.

Following stages implementation recommended by Zaman and Gebeily (2014), Le Houerou and Taliercio identified six stages in a compressive implementation of MTEF as presented in Table 1.1 below. MTEF is not only adopted in managing public expenditure; it has also been successfully linked to poverty alleviation programs. Le Hourou and Tailiecio *(ibid)* noted, "MTEFs are receiving renewed attention in the context of the formulation of Poverty Reduction Strategy Papers (PRSPs). This has, in the MTEF, an ideal vehicle for actually incorporating them into public expenditure programs within a coherent macroeconomic, fiscal, and sectoral framework."

Table 2.1 Stages of a MTEF Comprehensive Implementation

STAGE	CHARACTERISTICS
I. Development of Macroeconomic/Fiscal Framework	• Macroeconomic model that projects revenues and expenditure in the medium term (multi-year).
II. Development of Sectoral Programs	• Agreement on sector objectives, outputs, and activities
	• Review and development of programs and sub-programs
	• Program cost estimation
III. Development of Sectoral Expenditure Frameworks	• Analysis of inter- and intra-sectoral trade-offs
	• Consensus-building on strategic resource allocation
IV. Definition of Sector Resource Allocations	• Setting medium term sector budget ceilings (cabinet approval)
V. Preparation of Sectorial Budgets	• Medium term sartorial programs based on budget ceilings
VI. Final Political Approval	• Presentation of budget estimates to cabinet and parliament for approval.

Source: *PEM Handbook* (World Bank, 1998a: 47-51), adapted

Ljungman (2007) listed reasons for adopting the medium framework in Sweden: *time lags* - there are lags between when an issue requiring government intervention is identified, the time it takes public decision-making bodies to propose and approve of measures and certain activities are implemented as an intervention measure. In addition to this, a certain amount of time is usually required before the policy comes into full effect. Appropriate policies, therefore, require early information on the *development of factors* that may motivate government intervention. These factors are early information regarding fiscal sustainability of policies priorities and future knowledge of macroeconomic conditions and trends – accurate macroeconomic forecast. These provide the basic tenet for the implementation of the MTEF.

Delay effects - The argument is; early access to information on the development of revenue and expenditure in the medium term allows the government to better assess the impact of current and proposed programmers. "In many cases, the full fiscal impact is delayed, and the presentation of the effect on government finances for a number of years is necessary for an objective evaluation of the government's policy". By assuming a three-year horizon in the budget framework, delayed or deferred effects become visible. Government investment programmes are examples, where initial expenditure usually is only a fraction of the fiscal impact for future years. Also, the effect of changes in the tax system or entitlement programmes. Such changes often have behavioural effects, and the full impact is usually felt after a couple of years.

Macroeconomic forecasts - macroeconomic forecasts is a major cornerstone of the medium-term fiscal framework in application. The macroeconomic framework analyses provide strategic pictures of variables resources such as GDP growth, unemployment and inflation. This arms the government with the needed tools to assess the behaviour of the economy, possible deviations from its equilibrium position and, consequently, how fiscal policy should be shaped to address the changing behaviour of macroeconomic variables over the period stipulated by MTEF. These macroeconomic projections are fed into the medium-term revenue and expenditure forecasts to present the government with a clearer picture of overall fiscal development and the expected trend for individual items in the budget.

Extant literature describes the medium-term budget framework (MTBF) as a key component of the MTEF. Clarifying the concept, Harris, et. al. (2013) cited by Allen et al. defines it as, "a set of institutional arrangements for prioritizing, presenting, and managing revenue and expenditure in a multiyear perspective." This is a broader definition incorporating a wide range of approaches that extends the life cycle of a budget beyond a single year period. Holmes and Evans (2003) stated, "MTBF provides the discipline within which explicit policy choices and tradeoffs are made". For example, in the Nigeria 2016 – 2018 MTEF, it was stated: "MTEF are important economic management reform documents designed to guide annual budgets and fiscal management over a three-year period".

Odi lists success characteristics of an MTEF to include: "a medium-term fiscal framework, estimates of the future costs of existing policies, and sector strategies setting out sector and sub-sector priorities for future spending". It is necessary to work towards the attainment of these success criteria to fully attain a mature MTEF.

Though extant literature reviewed this far are rich and touched on all aspects of MTEF, nothing is said about the success or otherwise of the application of MTEF in Nigeria annual budgets. How has the implementation of MTEF in Nigeria imposed fiscal disciple realized in budget performance outcome? Grigoli, Mills, Verhoeven, Vlaicu (2017) noted, "when MTEF is well implemented, we should observe spending that is limited by resources availability. This assertion is yet to be tested empirically with data from Nigeria budgets. This paper is structured to empirically examine whether the adoption and implementation of the medium expenditure framework (MTEF) in the Nigeria budgeting process has improved the alignment of available resources (fiscal efficiency) with national policy priorities. given that it has been applied to budgets process in Nigeria dating back to 2010. This provide the gap for the current effort.

2.3 Hypothesis

Following the arguments in this paper, we will tested the hypothesis below that states:

(i) ***The adoption and implementation of MTEF in Nigeria has drastically reduced budget overruns (fiscal discipline).***

Dwight et al (1987), stated that, "Most of the debates on fiscal discipline has been focused on the federal government- its debt, budget deficit, and overall growth." Continuing Dwight et al. noted, "The states employ a variety of fiscal discipline management tools, the most widely used fiscal discipline tool ……is the requirement of a balanced budget". With the adoption of MTEF in Nigeria since 2011, how successful has fiscal disciple measures, following criteria identified by Dwight et.al *(ibid)*, being implemented. Our hypotheses is constructed to answer question.

3. Methodology and Data Construction

Quantitative econometric methodology is not suitable in this work as the data generated is not a time series. We combined the correlation coefficients measurement and descriptive statistics based on data generated by the authors and presented in tables to establish the relationships between projected and actual in the fiscal projections. The Budget Deviation index (BDI) is also used to analysis the level of fiscal discipline, if any, imposed by the adoption of MTEF in the Nigeria budgeting process. Le Houerou and Taliercio both staffers of the World Bank used this methodology. These authors noted that the budget deviation index (BDI) is a "useful indicator for assessing the match between execution and formulation of a budget." (the balanced budget). BDI is computed as "the sum total of the absolute values of the differences between the approved and the executed budgets expressed as a percentage of the approved budget." This method help us examine the deviations from budgeted and actual fiscal targets to analyze the effect of the application of MTEF in Nigeria.

3.1 Data Construction

The data used in this paper is constructed from Nigeria Budgets since 2003 through 2016 as presented in Table 3.1 below. The other tables was similarly constructed, Table 3.1 was constructed using recurrent expenditure non-debt data only. Recurrent expenditure non debt, often times consumes over 50 percent of aggregate budget expenditure. As an expenditure items, it could give a true indication of how well public expenditure is aligned with policy priority under the MTEF. Further, data from the other budget fiscal items were computed and presented as indicated on the table for each of the five included budget years to study their behaviour. In particular, we set these tables using three different key fiscal items: *benchmark crude oil price, crude oil production, crude oil revenue* and, two expenditures items: recurrent expenditure non debt and capital expenditure. The behaviour of these fiscal and expenditure items could very well aid the discussion

of the hypotheses stated above.

All the data presented on tables 3.1 through table 3. 5 are structured to state the projected against the actual figures and the percentage shortfall or overrun of each of the included fiscal or expenditure items. Further, data analysis is summarized on table 4.1, which also presents more details and help explain our findings.

Table 3.1 Budget Deviation Index (BDI) FY 2003 – FY 2016 (Recurrent Expenditure Non –Debt) N billi

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Projected	508.8	788	737	1,610.50	1,256.90	1,824.70	1,824.71	2,078.22	2,425.07	2,425.05	2,415.75	2,454.89	3,171.05	2,646.39
Actual	984.4	1,032.70	730	1,290.60	NA	1,553.83	1,717.50	2,546.16	2,527.26	2,400.30	2,386.84	2,216.77	2,550.07	2,411.62
Shortfall %	48.31	31.0	.94	24		17.4	5.87	17	4.0	1.02	1.0	9.69	19.58	8.87
Overrun %	93.47	23.69	.95	32		15.1	12.5	22.52	4.2	1.03	1.2	10.74	24.35	9.73
BDI	141.1	54.69	1.89	56		32.5	46	39.52	8.2	2.05	2.2	20.43	43.93	18.6

Sources: Table Set Up by the Author

Table 3.2 2009 Budget (Projected and Actual) Figures (Selected Fiscal Items)

Fiscal Item	Projected (N Billion)	Actual (N Billion	Difference	Percentage Overrun/Shortfall %
Benchmark Oil Price	US$45pb	US$63pb	18	40.
Oil Production	2.292mb/d	2.132mb/d	(0.16mb/d)	(6.98)
Oil Revenue	1,846.42	1,438.56	38.08	(10.85)
Recurrent Expend non-debt	1,824.71	1,717.50	(107.21)	(5.87)
Capital Expenditure	928.18	562.37	(365.81)	(39.39)
Aggregate Expenditure	3,205.16	2,697.23	(507.93)	(15.85)

Source: 2009 Budget Performance Analysis

4. Data Analysis and Hypothesis Testing

In testing the validity of the stated hypotheses, we used data computed by the authors to measure the correlation coefficients for each of the three fiscal items: recurrent expenditure, capital expenditure and aggregate expenditure as generated on Tables (See Appendix). We computed the correlation coefficient as indicated on Tables 4.1, 4.2 and 4.3 for each of the three fiscal items included in this work.

Table 4.1 Correlation Coefficient: Recurrent Expenditure (N bn.)

Year	Projected	Actual
2009	1,824.71	1,717.50
2010	2,078.20	2,546.16
2014	2,454	2,216.77
2015	3,171.05	2,550.07
2016	2,646.39	2,411.63
Correlation	0.66	

Table 4.2 Correlation Coefficient: Capital Expenditure (N bn.)

Year	Projected	Actual
2009	928.18	562.37
2010	1,746.69	935.61
2014	1,119.62	587.01
2015	557.06	389.39
2016	1,587.40	1,219.47
Correlation	0.8926806	

Source: Authors' Excel computation

Table 4.3 Correlation Coefficient: Aggregate Expenditure

Year	Projected	Actual
2009	3,205.31	2,697.23
2010	5,159.66	4,098.00
2014	4,695.20	4,123.42
2015	5,067.89	4,767.37
2016	5,719.61	3,680.22
Correlation	0.6877497	

Source: Authors' Excel computation

Similar correlation test were conducted on the three revenue items to also determine the correlation between the projected revenue for the fiscal year and actual performance in each of the three revenue items included in this work. It was found that the correlation between the projected and actual recurrent expenditure is .66, indicating a fairly strong association.
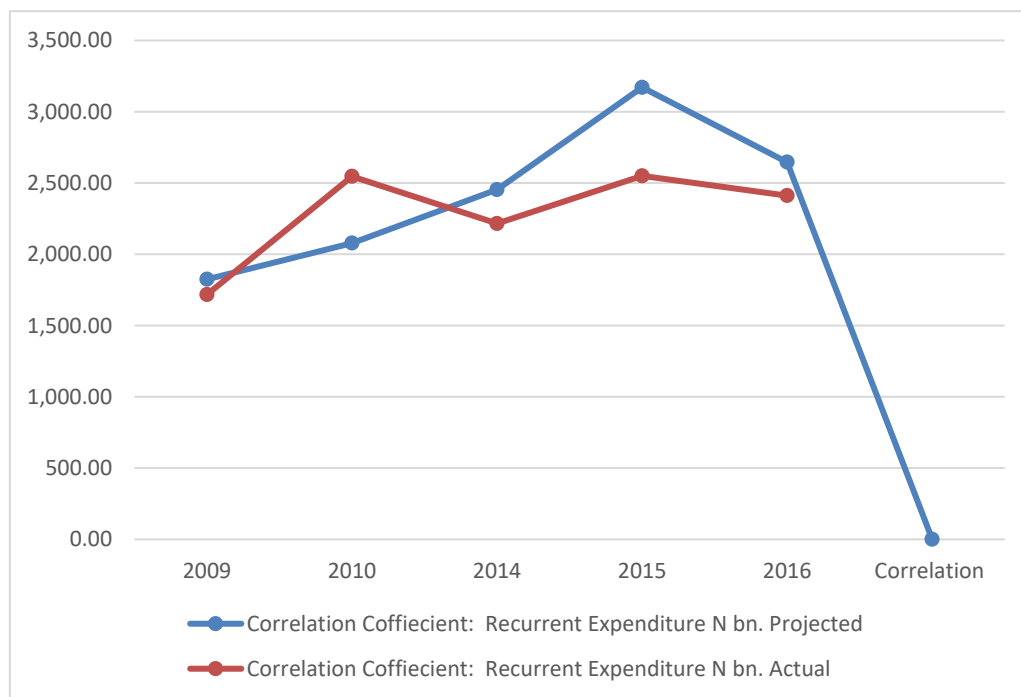

Figure 4.1 Correlation Coffiecient Recurrent Expenditure (N bn.)

Similar result was obtained for the projected and actual capital expenditure with a correlation coefficient of **0.8926806** indicating a strong association between the two variables. In the case of aggregate expenditure, the correlation coefficient is **0.6877497** which also indicates a strong association between the two variables. This relationship is graphically illustrated in fig. 4.1 above.
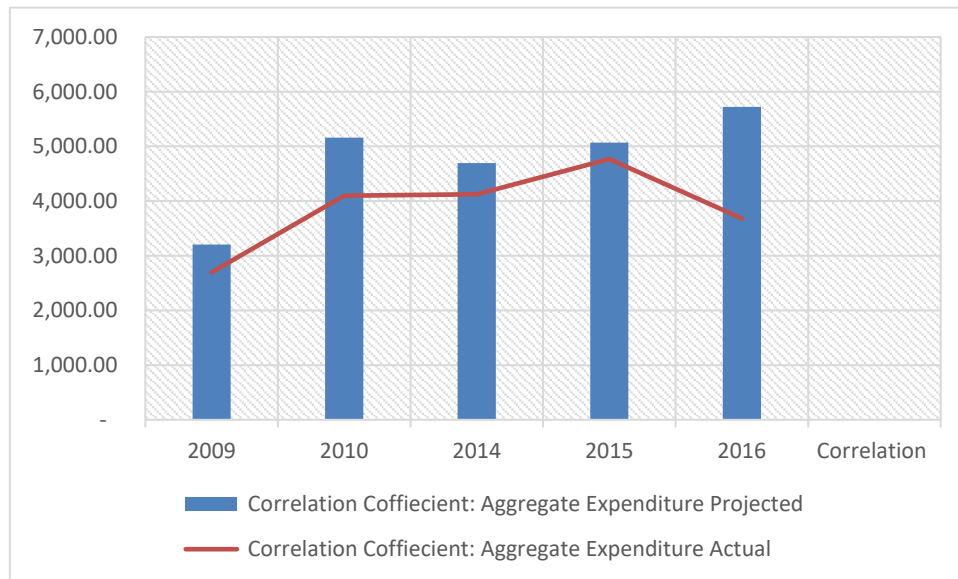
Figure 4.2 Correlation Cofficient: Aggregate Expenditure (Nbn.)

The revenue items were similarly tested to determine the correlation between the projected and actual revenue performance. In two of the three revenue items (benchmark oil price = **0.75** and oil revenue = **0.9193025),** and we find a strong liner association between the projected and actual revenue. However, in oil production, the projected is strongly negatively **(-0.005226**) corrected with the actual. This is graphically illustrated in figure 4.3 below and could very read off from the graph be read off.

Table 4.4 Correlation Coefficient: Benchmark Oil Price (N bn)

Year	Projected	Actual
2009	45.00	63.00
2010	67.00	81.00
2014	77	76.00
2015	53.00	43.69
2016	38.00	49.47
Correlation (r)	0.75	

Source: Author's excel computation

Table 4.5 Correlation Coefficient: Oil Production (mb/d)

Year	Projected	Actual
2009	2.292	2.132
2010	2.350	2.257
2014	2.390	2.462
2015	2.280	2.190
2016	2.200	2.462
Correlation (r)	-0.005226	

Source: Authors' Excel computation

Table 4.6 Correlation Coefficient: Oil Revenue (N bn.)

Year	Projected	Actual
2009	3,114.31	2,776.40
2010	2,068.06	1,266.88
2014	4,359.87	2,973.31
2015	2,583.16	1,859.36
2016	1,778.30	1,453.24
Correlation	0.9193025	

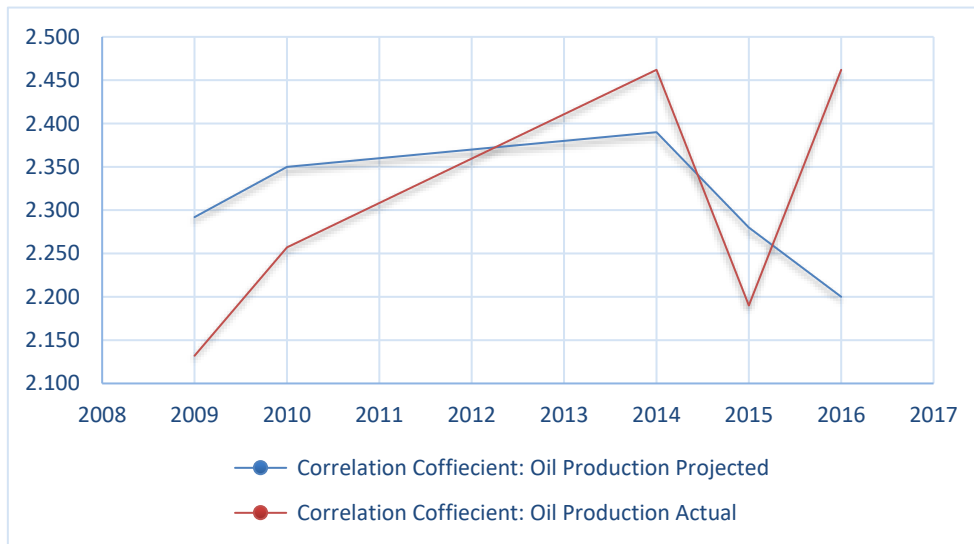Source: Authors' excel computation

Figure 4.3 Correlation Coefficient Oil Production (Mb/d)

Source: Authors' Work

The correlation coefficient for the projected oil price in US dollar measured against the actual performance is = 0.75. This is diagrammatically illustrated in figure 4.4 below.
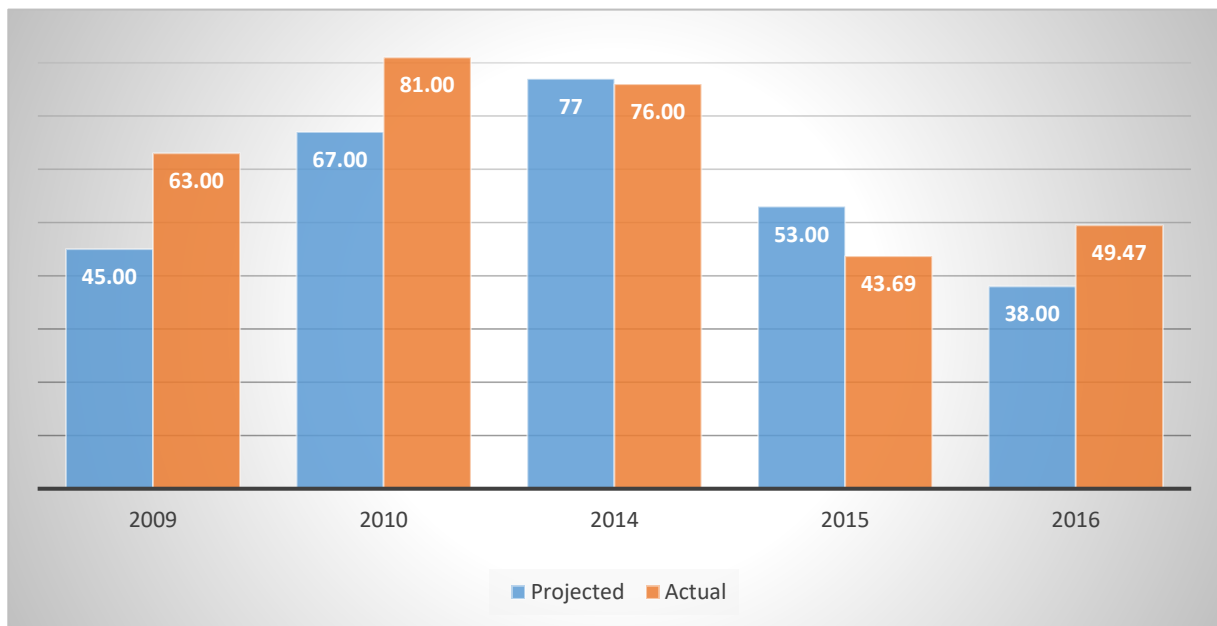

Figure 4.4 Correlation Coefficient: Benchmark Oil Price (USD $ p/b

Source: Authors Work

4.1 Testing Significance of Correlation Coefficient (r)

The correlation coefficients *r* as calculated in both the fiscal and revenue items, are indicative of the strength of the linear associations between the projected and actual performance of the different budget items. The linear relationship allows us to assume that both projected and the actual budget figures go together, in other words, government expenditure as budgeted actually follows real time government fiscal expenditure. If this is the case, we can safely assume that the implementation of MTEF in Nigeria has enthroned fiscal discipline in government expenditure. Nevertheless, the reliability of the linear relationship depends very much on the sample size *n*, and value of the correlation coefficient *r*. This corollary condition therefore demands of us to look at both the sample size *n* and the correlation coefficient *r* simultaneously, to either reject or accept the linearity assumption. This thus leads us to the test of significance of the correlation coefficient to decide whether the linear association in the sample data is strong enough to model the same association in the population data.

Null   *Ho*: $\rho = 0$

Alternative: *Hₐ*: $\rho \neq 0$

$\alpha = 0.05$

Decision rule: Reject *Ho* and accept   *Hα*: if *r* > - *critical value or r* > + *critical value.*

In our current cases we computed *r* = 0.66 for recurrent expenditure.

Where; *n* = 5, df = *n* – 2 = 5-2 = 3.

The critical values associated with df = 3, are -0.878 and +0.878.

Since *r* = 0.66 and 0.66 < .878, *r,* is significant. Therefore we reject *Ho*: and accept the alternative *Hα*.

The correlation coefficient *r* is significant.

Capital expenditure has a correlation coefficient *r* = 0 .8926806, n is 5. The df = 5 – 2 = 3. The critical values are: -0.878 and +0.878. Since *r* = 0.893 and 0.893 > 0.878, *r* is significant. Therefore we reject Ho: and accept the alternative Hα. The correlation coefficient r is significant.

Aggregate expenditure has a correlation coefficient *r* = 0 .688, and n is 5. The df = 5 – 2 = 3. The critical values are: -0.878 and +0.878. Since *r* = 0.688 and 0.688 < 0.878, *r* is significant. Therefore we reject Ho: and accept the alternative Hα. The correlation coefficient *r* is significant. This implies that the linear relationship between projected and actual aggregate expenditure could be used to model the population data. Following these findings we therefore accept the hypothesis- (i) *The adoption and implementation of MTEF in Nigeria has drastically reduced budget overruns (fiscal discipline).*

5. Findings, Discussion and Conclusion

Our findings is based on the test of the single hypothesis proposed for this work. Using data generated from fourteen different Nigeria budgets (see Table 3.1), we found a strong correlations between the projected and actual fiscal expenditure in all three fiscal items: recurrent, capital and aggregate expenditures. The revenue items: benchmark oil price and oil revenue also exhibited similar strong correlation between projected and actual figures. Oil Production (Mb/d) however shows a negative correlation between projected and actual. The adoption and implementation of the MTEF in most of sub-Sahara Africa countries is intended primarily, to reduce if not end, the ever persistent deficit budgets experienced in these countries over severally decades of bad public expenditure management. Our findings, correlation between projected and actual public expenditure gives an indication of some modicum of fiscal discipline which could be attributed to the adoption of MTEF in Nigeria.

What explanation could we offer for this? In the context of academic endeavor, we could attributed it to a more accurate macroeconomic forecast due to the application of the instrumentalities of MTEF. This is empirically demonstrated by the strong correlation that exist between the projected and actual figures in the revenue items. The dwindling oil production, starting about the second quarter of 2014 and negatively peaked in 2015, (see fig. 4.3) was due to the crisis in the Niger Delta, and explains the negative correlation in oil production. Conclusively we could safely say the adoption and implementation of MTEF has improved fiscal discipline in the Nigeria public management.

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Appendix 1

Table 3.3 First MTEF 2010 Budget (Projections and Actual)

Fiscal Item	Projected (N Billion)	Actual (N Billion	Difference	Percentage Overrun/Shortfall	%
Benchmark Oil Price	US$67/bp	US$81/bp	14	20.89	
Oil Production	2.35mb/d	2.257mb/d	0.093mb/d	(9.3)	
Oil Revenue	2,068.06	1,266.88	(801.18)	(38.74)	
Recurrent Expend Non-debt	2,078.20	2,546.16	467.96	22.52	
Capital Expenditure	1,764.69	935.61	(829.08	(46.98)	
Aggregate Expenditure	5,159.66	4,098.79	(1,060.87)	(20.56)	

Table 3.4 2014 Budget (Projections vs. Actual) Figures

Fiscal Item	Projected (N Billion)	Actual (N Billion	Difference	Percentage Overrun/Shortfall	%
Benchmark Oil Price	US$77.5/b	US$76/b	(1.22)	1.57	
Oil Production	2.39md/d	2.462mb/d	.072mb/d	3.01	
Oil Revenue	3,840.87	2,973.31	(1,386.56)	31.80	
Recurrent Expend Non-debt	2,454.89	2,216.77	(329.12)	9.69	
Capital Vote	1,119.62	587.61	(352.01)	47.51	
Aggregate Expenditure	4,695.20	4,123.42	571.78	12.18	

Source: Data sourced form 2014 and 2015 Budget Performance Analysis

Table 3.5 2015 Budget (Projection and Actual) Figures

Fiscal Item	Projected (N Billion)	Actual (N Billion	Difference	Percentage Overrun/Shortfall	%
Benchmark Oil Price	US$53bp	US$43.69 pd	(9.31)	(17.56)	
Oil Production	2.28mb/d	2.19 mb/d	(0.09mb/)	(3.95)	
Oil Revenue	2,583.16	1,859.36	(723.80)	(28.02)	
Recurrent Expend. non-debt	3,171.05	2,550.07	(620.98)	(19.58)	
Capital Expenditure	557.00	387.39	(167.61)	(30.45)	
Aggregate Expenditure	5,067.89	4,767.37	(300.52)	(5.92)	

The 2015 budget was a product of the 2015 – 2017 MTEF

Table 3.6 2016 Budget (Projection and Actual) Figures

Fiscal Item	Projected (N Billion)	Actual (N Billion	Difference	Percentage Overrun/Shortfall	%
Benchmark Oil Price	US$38/bp	US$49.47/bp	11.47	30.18	
Oil Production	2.20mpd	2.462mbp	0.0462mbp	2.1	
Oil Revenue	1,778.30	1,453.24	(325.06)	(18.27)	
Recurrent Expend. Non-debt	2,646.39	2,411.63	234.76	(8.87)	
Capital expenditure	1,587.40	1,219.47	(367.93)	(23.17)	
Aggregate expenditure	5,719.61	3,680.22	2,039.61	(35.65)	

Source: Budget Office of the Federation Ministry Of Budget And National Planning

Appendix 2

Table 4.1. Summarized Budget Performance Analyses (Selected Fiscal and Revenue Items)

Fiscal Item/ Year (1)	Benchmark Oil Price $USD/b (2)	Oil Production mb/d (3)	Oil Revenue N billion (4)	Recurrent (5) Expenditure Non-debt N bill.	Capital Expenditure N billion (6)	Aggregate Expenditure N billion (7)
2009	**2009**	**2009**	**2009**	**2009**	**2009**	**2009**
Projected Actual	45	2.292mb/d	3,114.31	1,824.71	928.18	3,205.31
% Short	63	2.132mb/b	2,776.40	1,717.50	562.37	2,697.23
fall/Overrun	40 Overrun	6.98 Shortfall	10.85Shortfall	5.87 Shortfall	39.00 Shortfall	15.51 Shortfall
2010	**2010**	**2010**	**2010**	**2010**	**2010**	**2010**
Projected	67.00	2.35 mb/d	2,068.06	2,078.20	1,746.69	5,159.66
Actual	81.00	2.257 mb/d	1,266.88	2,546.16	935.61	4,098
% Shortfall/ overrun	20.89 Overrun	9.30 Shortfall	38.74Shortfall	22.52Overrun	46.98 Shortfall	20.56Shortfall
2014	**2014**	**2014**	**2014**	**2014**	**2014**	**2014**
Projected	77	2.39	4,359.87	2,454	1,119.62	4,695.20
Actual	76	2.462	2,973.31	2,216.77	587.01	4,123.42
% Shortfall/ overrun	1.57 Shortfall	3.01 Overrun	31.8 Shortfall	9.69 Shortfall	47.51 Shortfall	12.18 Shortfall
2015	**2015**	**2015**	**2015**	**2015**	**2015**	**2015**
Projected	53	2.28	2,583.16	3,171.05	557.06	5,067.89
Actual	43.69	2.19	1,859.36	2,550.07	389.39	4,767.37
% Shortfall/ overrun	17.56 Shortfall	3.95 Shortfall	28.02Overrun	19.58 Shortfall	30.45 Shortfall	5.92 Shortfall
2016	**2016**	**2016**	**2016**	**2016**	**2016**	**2016**
Projected	38	2.20	1,778.30	2,646.39	1,587.40	5,719.61
Actual	49.47	2.462	1,453.24	2,411.63	1,219.47	3,680.22
% Shortfall/ overrun	30.18 Overrun	2.10 Overrun	18.27Shrotfall	8.87 Shortfall	23.17 Shortfall	35.65 Shortfall

Source: Computed by the Authors based on summarized data from Tables: 3.2, 3.3, 3.3, 3.4 and 3.5 (see Appendix 1)