EFFECT OF CENTRAL BANKS' GOVERNANCE ON MONETARY POLICY:

A CROSS-SECTIONAL ANALYSIS OF SELECTED SUB-SAHARAN AFRICAN

CENTRAL BANKS

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Abstract: *The objective of the study was to investigate the effect of governance on monetary policy objective. .The research was conducted through a cross-sectional analysis. A sample was obtained from the selected 16 Sub-Saharan African central banks websites. The target populations were 52 Sub-Saharan African countries where only 16 countries were selected for the study because of the data constrains. The websites of central banks from 1996 to 2011 were used which the researcher selected a maximum of 288 observations. The selected countries were reached through convenience sampling procedure for the study. The study used reports from central banks to gather pertinent data. Data Analysis was analyzed through the use of qualitative and quantitative analysis. Regression model was estimated using the random effects methods and tested by the Hausman random effects. ANOVA was used to test for differences among the means of the populations by examining the amount of variations between each of the samples, relative to the amount of variation between the samples. The findings suggest that governance proxy is another measure of central bank independence from the politician that results to appointment and dismissal of governor's turnover rate in office because of the election cycles. The study recommended that high inflation has adverse effects on economic performance either by creating distortions, encouraging rent seeking activity, or by raising risk premier, one would expect central bank independence to improve economic performance.*

Key Words: *Governance, monetary policy*

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INTRODUCTION

According to Central Bank Independence, the Bank's monetary policy objective is to deliver price stability – low inflation – and, subject to that, to support the Government's economic objectives including those for growth and employment. Price stability is defined by the Government's inflation target of 2%. The remit recognizes the role of price stability in achieving economic stability more generally, and in providing the right conditions for sustainable growth in output and employment. The Government's inflation target is announced each year by the Chancellor of the Exchequer in the annual Budget statement.

Moreover, the theoretical literature (Masciandaro and Tabellini, 1987; Castellani and Debrun, 2001; Montiel, 2003) shows that central bank independence should affect the design of fiscal policy, i.e. a greater degree of independence influences the central government to fiscal discipline; inversely, a weak independence could influence the government to fiscal laxity. This view is associated with the question of sources of financing for government deficit. The adoption of an independent central bank deprives the government from inflation tax and so constitutes a strong signal for fiscal discipline. According to Mankiw (1987), inflation is a source of revenue and must be considered as a part of the global budgetary policy. Indeed, as debt and interest rates are measured in nominal terms (i.e. the interest rates are not indexed on inflation rate), generating inflation depreciates the real value of intern public debt and interest payments. Masciandaro and Tabellini (1987,) conclude that "the crucial determinant of fiscal policy is the monetary regime, that is, the link between current deficits and future monetization"

However, it has been noted that, despite the voluminous literature on central bank independence, the majority of empirical studies on central bank independence are focuses on the relationship between central bank independence and inflation. There has been few positive analysis of the relationship between central bank independence and budget deficits. The most widely employed index of central bank independence is due to Cukierman, Webb, and Neyapti (1995), although alternative measures were developed by Bade and Parkin (1985), and Alesina, Masciandaro, and Tabellini (1991), among others.

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METHODOLOGY

According to Kothari (2005), research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. It sought to observe, explain, and describe phenomena of interest without manipulating the variables or the respondents. The study was appropriate to provide secondary information.

The research was conducted through a cross-sectional analysis. A sample was obtained from the selected 16 Sub-Saharan African central banks websites. These methods were suitable as non-experimental and were only concerned mainly with explanation, descriptions and explorations of opinions, attitudes, preferences and perception, as it exists at the time of the study and to describe present conditions, events or policy based on the impressions or reactions of the respondents of the research (Creswell, 1994). The researcher opted to use this kind of research considering the desire of the researcher to obtain data from the sample so as to formulate rational, sound conclusions and recommendations for the study.

TARGET POPULATION

 According to Mugenda and Mugenda (2003) target population is the population targeted for the study. It refers to all the units of whatever nature that a researcher intends to study. The population refers to the group of people or study subjects who are similar in one or more ways and which forms the subject of the study. The target populations were 52 Sub-Saharan African countries where only 16 countries were selected for the study because of the data constrains. This countries economic attributes were observed over a period of 15 years. This was done in order to come up with a realistic information bearing in and it's how contributions to the economical development of a country.

SAMPLE AND SAMPLING TECHNIQUES

The data for our sample of 16 African countries was retrieved from various sources including the World Bank, IMF Financial Statistics, Central Statistical Offices, the worldwide governance indicators (WGI) and the websites of central banks from 1996 to 2011 which

gives the researcher a maximum of 288 observations. The selected countries were reached through convenience sampling procedure for the study. The stratification of the sample allowed for diversity of views and analysis. This is possible because of the following reasons. First, sampling is undertaken due to limitation of resources and availability of the data in some other countries. There is a limitation of time, finances and research personnel. Secondly, sampling enabled detailed data collection and analysis. Finally, it is no longer possible to use the entire population. A clearly selected sample is therefore assumed to be representative of the entire population.

DATA COLLECTION METHODS

According to Kothari (2005); there are several methods of collecting data, particularly survey and descriptive research. The data for our sample of 16 African countries was retrieved and obtained from various sources including the World Bank, IMF Financial Statistics, Central Statistical Offices and the websites of central bank.

DATA COLLECTION INSTRUMENTS

The study used reports from central banks to gather pertinent data. The researcher also used previous studies on the same to compare them with existing data in order to provide conclusions and competent recommendations. Acquiring secondary data was more convenient to use because they were already condensed and organized and readily available. The researcher personally retrieved the data.

DATA ANALYSIS AND PRESENTATION

Data Analysis was analyzed through the use of qualitative and quantitative analysis and presented in tabular form. Data analysis was facilitated by the use of SPSS (Statistical Package for Social Scientist) and spreadsheet Computer package using the following models as follows.

Pearson product-moment correlations (PMMC)

The Pearson product-moment correlation coefficient (PMCC) is a quantity between -1.0 and 1.0 that estimates the strength of the linear relationship between two random variables. It is to be noted that correlation simply describes the relationship between the two variables and does not explain why they are related. Therefore, a correlation should not be interpreted as a proof of a cause-and-effect relationship between the variables X and Y. Similar results was provided by Spearman rank-order correlation coefficient.

$$\Upsilon_{xy} = \frac{n(\sum XY) - N(\sum X)(\sum Y)}{[n(\sum X^2) - (\sum X)^2][n((\sum Y^2) - (\sum Y)^2}$$

Where:

> *n = number of paired observations*
>
> *∑XY = sum of cross of products*
>
> *∑X and ∑Y are sum of X and Y respectively*
>
> *$\sum^{X2}$ = sum of all the squares values of the X scores*
>
> *$^{\sum Y2}$ = sum of all the squares values of the Y scores*
>
> *$^{(\sum X)\,2}$ = sum of all the X scores, this sum squared*
>
> *$^{(\sum Y)\,2}$ = sum of all the Y Scores, this sum squared*

The regression analysis:

The regression model of the structure provided below was estimated using the random effects methods where the equation is tested by the Hausman random effects. The dependent variable is regressed with the CBI indexes to check R^2 as well the assumption made is that they depend on one another as follows:

Y = ϐ0 + ϐ$_1$X$_1$ + e

Where:

> *Y = Monetary policy*
>
> *X$_1$ = Term of governor in office*
>
> *e= Error Term*

Analysis of variance (one-way ANOVA)

The basic principle of ANOVA is to test for differences among the means of the populations by examining the amount of variations between each of the samples, relative to the amount of variation between the samples. In this case the researcher's concern is to analyze the performance of various monetary policies in order to know whether their performances differ significantly and investigate any number of factors (CBI) which are hypothesized or said to influence the dependent variable. The ANOVA technique is important in this context because the researcher wanted to compare more than two populations such as the CBI on monetary policy outcomes and investigated the differences among the means of the population's simultaneously.

The hypothesis of the study is similarly analyzed through the use of ANOVA due to insignificance results observed by the regressed models. ANOVA gave a more explanatory power of the independent variables than regression thus more preferred. The tests of the hypothesis using ANOVA therefore provides the yeast of this study which would have been insignificant due to dummy results of regression model making it significant.

The ANOVA model:

$$Y_{ij} = \mu + t_i + \sum_{ij}$$

Where:

μ = grand mean

$t_i = i^{th}$ treatment effect.

$\sum_{ij}$ = random error term.

Y_{ij} = dependent variable.

i.e the response of the ij^{th} experimental units that receive the ith treatment.

The researcher tested;

$$HO: \mu_1 = \mu_2 = \mu_3 - - - - - - - - - = \mu_t$$
$$H1: \mu_1 \neq \mu_2 \neq \mu_3 - - - - - - - - - - - \neq \mu_t$$

Or at least one μ_o is different.

ANOVA Theorem

Total Sum of squares (TSS)

TSS = (Square of square due to treatment) + (sum of squares of due to error)

$$TSS = SStr + SSE$$
$$\sum (Y_{ij} - \bar{Y})^2 = \sum (Y_i - \bar{Y})^2 + \sum (Y_{ij} - \bar{Y})^2$$
$$\text{Correlation factor } CF = [\; \sum_i^t \sum_j^n y_{ij} \;]$$

Total sum of squares

$$TSS = \sum_i \sum_j y_{ij - CF}$$

Sum of squares due to treatment $SStr = \sum t_i^2 - CF$

$$\frac{i = t}{n}$$

SSE = TSS − SStr

Mean sum of squares due to treatment (MSStr) = $\underline{SStr}$

t- 1 (numerator)

Mean sum of squares due to error (MSE) = $\underline{SSE}$

(nt -1)(t − 1) (Denominator)

$$= \frac{SSE}{Nt - t}$$

Test statistics;

F = $\underline{\text{MSStr (Estimate of population variance based on between samples}}$

variance.

MSE (Estimate of population variance based on within samples variance

Reject H$_O$ if F > Fα (t-1, nt- t)

Accept otherwise.

FINDINGS AND DISCUSSIONS

Table 1: Descriptive Statistics

Descriptive Statistics										
	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error
GOVERNANCE	288	13.07	-12.00	1.07	-.6053	.06363	1.07989	1.166	-4.017	.144

Source: The researcher 2013.

The output produced shown above in table 1. The first line tells us about the data set for which descriptive statistics have been calculated. The first column in the group output table, labelled N gives the number of cases in that data set followed by range. In the next two columns, that minimum and the maximum values of the variables selected for the study is given. In the last three columns, the mean, standard deviation and the variance are given while the last column gives tells us where the data selected is skewed to.

It can be seen that the *Governance* of the monetary outcomes vary from -12.00 to 1.07 with a mean of -.6053, standard deviation of 1.07989, variance of 1.166 and skewed to the negative at -4.017.

Table 2: Correlations

Correlations		GOVERNANCE
GOVERNANCE	Pearson Correlation	1
	Sig. (2-tailed)	-
	N	-

Source: The researcher 2013

The output produced is shown in the table 1 above, the output gives correlation for the variable and each correlation is produced twice in the matrix. In the correlation matrix, the researcher gets Pearson's correlation coefficient, P-value for two-tailed test for significance and the sample size. From this table the researcher can conclude that there is a positive correlation between monetary objectives outcomes and the governance hence the correlations is significant at the significance level of α= 0.05 (which was given at *significance 5%). Results for correlation between other set of variables can be interpreted similarly. The same results was generated though the non-parametric correlations.

Table 3: Regression Results random effects

Independent Variables	Money Supply	
I.V	t	Beta
Governance	2.774**	0.150**
(Std error)	(1.128)	
Constants	19.509***	
	(2.652)	
R-Square	.247	
Adjusted R^2	.231	
N	288	

Sources: Researcher (2013)

Note: *GOVERNANCE is a proxy for the political stability. The significance levels are given by **significant at 5%; V insignificant; Standard errors in brackets.*

The Wooldridge test for autocorrelation in panel data is used to test for autocorrelation and the researcher also test for panel level heteroskedasticity. The results suggest that the researcher's model does not suffer from these problems. (The test is derived by Wooldridge (2002) to test for autocorrelation in panel data models. Drukker (2003) affirms that the test is reasonably good in plausibly sized samples) The Haussman test indicates that the random effects technique is most appropriate to use. The Hausman test indicates again that the random effects technique is more appropriate to use. The variable in the model is correctly signed and significant. The R^2 is 0.174 indicating that the model can explain around 17.4% of variations of the above variable of monetary policy. Once more, the Wooldridge test for autocorrelation and the test of heteroskedasticity were performed indicating that there is no such problem in our model.

As it can be seen from the table, the R-Square are not enough to explain all the variation. There are other sources which can generate monetary objectives outcomes in Africa; but governance which is proxy for political measure has a high negative indicating that for the CBI to be achieved in Africa there must be stable political will.

Output of ANOVA

ANOVA provides us the results of the inferential statistics as requested. One-way ANOVA gives the results of the analysis for omnibus hypothesis. The results are gives in three rows in collaboration with the regression results. The first row labelled regression gives the variability due to the monetary policy factor (between-groups variability), the second row labelled residual gives variability due to the random error term and the third row gives the

total variability as summarized in the table below. Equally, as one CBI is omitted from the regression equation the R^2 decreases while the F-value increase as summarized below.

Table 4: ANOVA results

Independent Variables	Money Supply	
I.V	**t**	**Beta**
Governance	*2.774**￼*	*0.150**￼*
(Std error)	*(1.128)*	
Constants	*19.509***￼ (2.652)*	
F	*15.352*	
N	*288*	

(*Source: the researcher, 2013*)

ANOVA results

The results obtained indicate that CBI is a relatively good means to combat inflation in Africa. However, even though it is a necessary instrument it is not a sufficient measure. As can be seen from this model, the R-squared is not sufficiently high to explain all the variation in the inflation rate. There are other sources which generate inflation in Africa. This is why other accompanying measures are needed to bring back the inflation rate to a satisfying level. The adoption of a responsible balance budget combined with an efficient application of price control can help restrain inflationary pressures. However, if price controls are done improperly, then this could encourage the development of parallel markets as is the case in certain African countries like Ghana, Nigeria, Zambia and Angola. If this happens, then the economic activity would shift to the hidden economy which in turn will negatively affect economic growth in Africa.

CONCLUSIONS

Governance proxy is another measure of central bank independence from the politician that results to appointment and dismissal of governor's turnover rate in office because of the election cycles. The next proxy for central bank independence is the term which is believed to be a good proxy especially in African countries because of experiences s/he will have on formulating those monetary policies and implementing them while in office. In addition the researcher also controls other factors such as the exchange rate, log of GDP, and money supply. The results obtained indicate that central bank independence contributes to reducing inflation rate. The two proxies capturing central bank independence, that is, the

turnover rates of central bank governors and the term of a governor in office are positively related to inflation, money supply, exchange rate and real GDP. This suggests that the higher the turnover rates of central bank governors is, the higher will be the rate of inflation. Similarly, lower rate of governance also implies higher misuse of monetary policies through the influence of politicians. However, results obtained also indicate that CBI is not a sufficient condition to resolve the problem of monetary policies in African countries. Other accompanying measures such as the commitment for governments to hold a responsible balance budget, trade openness, unemployment are also required.

RECOMMENDATIONS

High inflation has adverse effects on economic performance either by creating distortions, encouraging rent seeking activity, or by raising risk premier, one would expect central bank independence to improve economic performance. If, as is often suggested (for example, Romer and Romer (1989)) most U.S. recessions result from the Federal Reserve cracking down on inflation after it has been allowed to increase too much, one might expect that more consistently inflation-averse policy would be associated with less variable economic performance.

On the other hand, traditional arguments for monetary policies that is politically responsive stress that politically sensitive central bankers are likely to be more concerned than independent bankers with increasing output and reducing unemployment and real interest rates. If monetary policy can achieve these objectives one might expect independent central banks to achieve lower rates of inflation at the price of inferior real economic performance and attract investment in African countries as investors will use TBS as a parameter of measuring CBR.

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