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Institutional Development and Monetary Policy Effectiveness: Empirical Evidence from African Economies

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Abstract

This study investigates whether institutional development measured in terms of government effectiveness improves the effectiveness of the monetary policy on output growth and inflation in Africa. Annual panel data for thirty-six African economies for 1996-2021 were employed in a system GMM estimation technique. We found strong evidence to support the effectiveness of monetary policy on inflation through government effectiveness. The interaction of monetary policy with government effectiveness significantly dampens inflation, whereas it could only improve output growth at its contemporaneous level and

first lag. Therefore, this study recommends better monetary policy effectiveness through government effectiveness, political stability, corruption control and regulatory quality.

Keywords: *Monetary policy, Real Output, Inflation Rate, Institutional Development*

JEL Code : E52, E10, H10, E02

As Africa awaits the adoption of a unified monetary policy and common currency, researchers and policymakers have occupied their minds with the search for an optimal transmission channel of monetary policy to real sector growth and stable price. Most previous studies (Fiador et al. 2022; Mensah et al., 2020; Effiong et al., 2020) suggest financial sector as plausible channel because it creates enabling atmosphere upon which policy responses affects real economy. This means that they recognised a developed financial system as the panacea for monetary policy to promote output and maintain price stability effectively. However, post-Keynesian economists believe that policies can never operate without institutional development; hence, poor institutions have been the bane of policy effectiveness (Arestis & Howells, 1992). This is more pronounced among African developing markets, given the high political instability, corruption regulatory bottlenecks, and structural and other institutional lapses in the continent.

Consequently, policies are more effective in economies with high institutional development than those with low institutional development (Lopes, 2014). This underscores the importance of institutional development as a monetary policy transmission channel to growth and price stability, particularly in developing economies. Even so, the search for an optimal channel continues to be a research issue in the literature. Therefore, we argue that since monetary policy is not limited to the financial institution, but cuts across almost every sector of the economy, focusing only on financial or policy instruments as plausible monetary policy transmission channels is delusionary.

In this study, while we examine whether institutional development measured in terms of government effectiveness exerts any reasonable influence on monetary policy effectiveness, the study also seeks to explore this in the long run by examining different lag structures. Therefore, the major gap this study aims to fill in the literature is to adopt a structural approach as a transmission channel to monetary policy effectiveness as against the focus on policy-driven and financial

instruments by previous studies. This is necessary, especially as monetary policy objectives could be conflicting. The policy conflict could worsen when it transmits through the credit channel, which is capable of triggering higher financial frictions in the financial system (Bernanke & Gertler, 1995). This hypothesis will be empirically tested in this study.

Furthermore, this study argues that monetary policy is more effective when the institutions that make up the economy are well developed such as the rule of law (Chinn & Ito, 2006). That is, they are corrupt-free, with the government being very effective, political system is democratic, and there are adequate measures of rule of law to checkmate excesses and compel obedience to law. Hence, the rationale for examining institutional variables of government effectiveness, control of corruption, political stability and regulatory quality as plausible monetary policy channels is based on previous studies (Chan et al., 2008; Shin, 2010; Vasylieva et al., 2020). This is because they are capable of encouraging investors, minimize embezzlement and misappropriation of funds, create the atmosphere for stable prices and ultimately generate growth. Hence, with focus on government effectiveness[1], this study examines how it promotes optimal monetary policy effectiveness as against the use of financial development which is limited in its scope.

The study is divided into five unique sections. The first section presents the general background of the study and justifies the need for the role of institutional factors as an optimal transmission tool for monetary policy effectiveness. The second section is the review of related literature, and it presents the findings and conclusions reached by previous studies. Gaps in the literature were also discussed in section two. The third section presents the theoretical model, research methodology, data description and measurements, model specification and estimation technique. The fourth section focuses on the results and discussion, while the last section presents the conclusion, implications and policy recommendation.

2.1 Literature Review

Several studies have sought to find the optimal monetary policy transmission channel. Some studies focused on the role of financial development with special reference to growth and inflation in Africa

[1] The rationale for choosing government effectiveness as the optimal monetary policy channel rather than other measures of institutions is explained under section 4.1.

(Vera Fiador et al. (2022); John et al. (2020); Effiong et al., 2020; Kasekende & Brownbridge, 2011; Heintz & Ndikumana, 2011; Khan, 2011). Only some others concentrate on institutional development's role. However, the main challenge with studies that focused on institutional development such as the works of Arestis & Howells (1992); and Niggle (1991) is that there was no empirical evidence. Those with empirical evidence (Vera Fiador et al., 2022; John et al., 2020) could not examine different lag structures to underscore its workability in the long-run. These among others are the identified gaps in the literature.

Fundamentally, empirical evidence in the literature suggests that two major perspectives exist on what constitutes the transmission channels to monetary policy effectiveness. They are the financial system and institutional development channels. The proponents of the financial system channel (Carranza et al., 2010; Knoop, 2008; Levine, 2005; Beck et al., 2000, 2006; Cecchetti, 1999; Rajan&Zingales,1998) assert that its importance is anchored on the fact that monetary policy actions transmit to the real sector through the financial sector variables. This operates through the credit market, particularly bank lending, which links the impact of monetary policy on the supply of bank loan-able funds, thereby helping to explain the effect of monetary policy on economic performance. Therefore, the focus here is on how changes in the monetary policy indicators affect the borrowers' and lenders' portfolio and investment decisions and ultimately influence the real economy. However, the extent to which the credit channel intermediates with monetary policy variables to generate higher output and stabilising effect depends on financial friction in the financial system (Effiong et al., 2020). The higher the levels of financial friction within the financial system, the higher the cost of borrowing, which can lead to higher credit spread. With a higher credit spread, the monetary authority will increase the use of monetary policy to cushion financial friction to generate greater output and control inflation. However, as domestic investment decreases due to the high cost of borrowing, aggregate output is reduced, and monetary policy becomes increasingly ineffective.

So far, the basic issue discussed affirms that financial friction negatively impacts monetary policy effectiveness when credit channels are used as transmission channels (Bernanke & Gertler, 1995). However, this view was refuted by Effiong et al. (2020), who argued that monetary policy effectiveness would be stronger in economies with high levels of financial friction but with less developed financial systems. This view was

supported by Aysun et al. (2013) and Ciccarelli et al. (2014), who stressed that the credit channel of monetary policy effectiveness is stronger when the financial system is replete with lots of financial frictions as it is the case among most African economies. As tenable as this argument is, its major weakness is that it disregards the role other institutions could play in the transmission process other than financial institutions. As was observed by Hyman (1986) that institutional developments in the UK financial markets and other institutions influenced the effectiveness of monetary policy. This suggests that focusing on financial institutions alone limits monetary transmission.

Moreover, weak institutions increase the cost of bank lending as a transmission channel of credit to monetary policy effectiveness among low-income countries with less developed financial systems (Mishra et al., 2012). This suggests that they recognized that institutional development still plays a vital role even when credit is considered as an optimal channel of monetary policy effectiveness. This finding is consistent with those of Kashyap and Stein (1997, 2000), who stressed that a stable institution is a panacea for monetary effectiveness even in supporting bank lending as the monetary policy transmission channel. Furthermore, Redek and Susjan (2005) investigated the role of legal institutional development in monetary policy effectiveness among 24 transition economies. Their findings reveal that institutional factors have an important role in monetary effectiveness. This conclusion was also reached by Kagundu and Martinez-Vazquez (2011), who used a broader sample of 89 countries and also concluded that institutional quality is essential in the monetary policy transition to growth. Carranza et al. (2010) also found evidence and concluded that monetary policy has a more significant impact on a less-developed financial system than on a more-developed one. By implication, they believe that monetary effectiveness could be endogenous to a financial institution's development model; hence, the nexus between the former and the latter can be best captured with models that address the endogeneity problem. This is an area in the literature that needs to be sufficiently explored.

Again, empirical evidence suggests that monetary policy transmission is ineffective under a developed financial institution (Carranza et al., 2010). According to them, firms will not be bank dependent for credit when the financial system is well developed, due to multiple accesses for funds created through financial innovations and development. As a result, the contractionary effect of monetary

tightening on bank loans during periods of high inflation cannot drain up the excess liquidity in circulation; hence, monetary policy becomes ineffective (Cecchetti, 1999). Therefore, the financial system's development level is inversely related to monetary policy effectiveness (Ma & Lin, 2016). Be that as it may, monetary policy operates in a gamut of the environment of the financial, legal, political, real, and even external sectors. Hence, assuming that only the financial system indicators influence its pass-through to higher output and the control of inflation will be deceiving; hence, the need to view monetary transmission channels from a broad institutional development perspective becomes one of the gaps in the literature that this study aims to fill.

Furthermore, most of the previous studies that examined the role of institutional development on monetary policy effectiveness concentrated their analyses on developed economies like UK and USA, as in Arestis & Howells (1992). This explains why Lopes (2014) believed that expansionary monetary policy is more effective in promoting the level of output among countries with high institutional development than in countries with low institutional development. He added that contractionary monetary policy has more adverse effects on output among countries with low institutional development than those with high institutional development. These pieces of evidence have not been sufficiently explored in the literature for African and other developing economies.

Besides, the deterministic role that price levels and institutional development/quality could play in improving the effectiveness of monetary policy in generating higher output returns, stable prices and institutional development could be endogenous to the growth/output model. This is one of the major setbacks in almost all the empirical literature investigating monetary policy effectiveness, particularly among those seeking a transmission channel to monetary policy effectiveness. Consequently, they adopted different estimation techniques with many limitations in addressing the problem of endogeneity in a model. Therefore, this study proposes to adopt the system GMM estimation technique that addresses the endogeneity problem, to investigate the interrelationships between monetary policy and institutional development in improving the effectiveness of the latter in output generation and price control among thirty-six heterogeneous African economies.

3.1 Theoretical Model

The analytical framework of this study is based on the general equilibrium model of the product (IS) and the money (LM) markets in a simple open economy case. The model seeks to ascertain the income/output level and interest rate pairs that lead to a simultaneous equilibrium in savings investment and money demand and supply. In an attempt to model the IS-LM model in an open economy, this study augments the Svensson (1996) and Ball (1993) general equilibrium model thus:

$$y_t = \beta_1 y_{t-1} - \beta_2\left(i_{t-1} - \pi_{t-1}\right) - \beta_3 E_{t-1} + \mu_t \; ; \; \frac{\partial y}{\partial i} < 0; \;\; \frac{\partial y}{\partial \pi} < 0; \; and \; \frac{\partial y}{\partial E} < 0 \;\; \ldots\ldots (1.1)$$

Equation (1.1) is an open economy IS curve which relates output to lags of itself ($_{it-1}$), interest rate ($i_{t-1} - \pi_{t-1}$) and the real effective exchange rate. The parameters β_1, β_2, and β_3 capture the structural effects of the three institutions in the model: the real sector/institution, money/financial institution and the external institution, respectively. Under a tighter monetary policy, output growth is expected to slow due to a rise in the real interest rate, leading to a fall in consumption and investment. This can worsen when net export contracts due to an appreciating exchange rate. All the variables are expressed in their real values, y represents the output gap (that is, the log of output relative to potential output); i is the nominal short-term interest rate, which is a monetary policy instrument; π is the annual inflation rate; and E represents the real effective exchange rate (decrease means depreciation).

On the other hand, Phillip's curve is used to represent the inflation level in an open economy in which inflation is a function of lag itself which captures inflation persistence and adaptive expectations, lag of output gap and lagged change in the exchange rate. The model is as presented under equation (1.2) thus:

$$\pi_t = \alpha_1 \pi_{t-1} + \alpha_2 y_{t-1} - \alpha_3\left(E_{t-1} - E_{t-2}\right) + \varepsilon_t \; \frac{\partial \pi}{\partial y} > 0; \;\; \frac{\partial \pi}{\partial E} < 0; and \; \frac{\partial \pi}{\partial i} < 0 \;\; \ldots. (1.2)$$

The variables remain as defined above, while a_1, a_2, and a_3 represent the institutional effects of the three sectors in the model. That is money, real and external sectors, respectively. If potential output rises above actual output, this creates an inflationary gap within the economy, thereby raising the level of inflation in the economy and vice versa. However,

actual inflation falls when the exchange rate depreciates. The interconnectedness of inflation with monetary policy is anchored on the relationship that exists between the exchange rate and real interest rate as expressed under equation (1.3) thus:

$$E_t = \lambda_1(i_t - \pi_t) + e_t \;; \quad \frac{\partial E}{\partial i} > 0; \;\; \frac{\partial E}{\partial \pi} < 0 \text{……………….…………} \quad (1.3)$$

The real effective exchange rate in the model (1.3) shows a positive relationship between monetary policy and the real exchange rate. This is used to establish that a rise in the interest rate leads to capital inflow from foreign markets in search of better returns. This suggests that the relationship between the policy rate and the real exchange rate is positive. Every other factor that determines the real exchange rate is captured by the term "e_t."

The critical aim of this study is to find the channels through which monetary policy can affect inflation and output. The theory assumes two channels: the nominal interest rate channel and the exchange rate channel. With an increase in the nominal interest rate, the output gap contracts, reducing inflation. Monetary policy contraction takes a double period lag to impact inflation than it does for output changes (Masia, 2009). On the other hand, an appreciating exchange rate dampens inflation but worsens output growth. In order to derive the optimal monetary policy rule, we re-arrange equation (1.3) thus:

$$i_t - \pi_t = \frac{E_t - e_t}{\lambda_1} \text{…………………………………………..} \quad (1.4)$$

Substituting model (1.3) into models (1.2) and substituting equation (1.4) into (1.1) gives the augmented Phillip's curves and output equation, respectively, that will be used to examine the effectiveness of the monetary policy. The outcome equations are presented under the model specification in this study.

$$\pi_t = \alpha_1 \pi_{t-1} + \alpha_2 y_{t-1} + \alpha_3 \lambda_1 (r_{t-2} - r_{t-1}) + \varepsilon_t \text{ ……….} \quad (1.5)$$

$$y_t = \beta_1 y_{t-1} - \frac{\beta_2}{\lambda_1}(E_{t-1} - e_{t-1}) - \beta_3 E_{t-1} + \mu_t \,; \text{ ……} \quad (1.6)$$

Note that in equation (1.5), "*r*" represents the real interest rate [i.e. $(i_{t-2} - \pi_{t-2}) - (i_{t-1} - \pi_{t-1})$] Equations (1.5) and (1.6) gives a simultaneous model with the optimal inflation rate and output gap as an endogenous variable, whereas the lag of inflation and other possible determinants such as institutional quality as specified below are the exogenous variables.

3.2 Model Specification

In this study, we specify an augmented version of the derived models in (1.5) and (1.6), where the interest rate and monetary policy interaction with institutional development were exogenous to models (1.5) and (1.6). The endogenous variables in the equation are lagged values of the output gap inflation rate and real exchange rate. Therefore, the econometric form of the model to be estimated is specified thus:

$$\pi_{it} = \phi_o + \phi_1 \pi_{it-1} + \phi_2 y_{it-1} + \phi_3 \Delta IR_{it-1} + \phi_3 MS_{it-i} * ID_{it-i} + v_i + \mu_{it}^{\pi} \quad \ldots\ldots (1.7)$$

$$y_{it} = \delta_o + \delta_1 y_{it-1} + \delta_2 RER_{it-1} + \delta_3 IR_{it-1} + \delta_4 MS_{it-i} * ID_{it-i} + v_i + \mu_{it}^{y} \quad \ldots\ldots (1.8)$$

The variables remain as defined above, except that *IR, MS, ID,* and *RER* are interest rate, broad money supply growth rate, institutional development variable, and the real effective exchange rate, respectively. π_{it}, y_{it}, μ_{it}^{π} and μ_{it}^{y} are *N* x *1* vectors of the dependent variables and the unexplained factors of π_{it} and y_{it}, respectively. The subscripts *i* and *t* are countries' specific identities and periods, respectively. ϕ's, and δ's is vector *K* x *1* of unknown parameters, while the regressors are *N* x *K* matrixes. We assume another matrix *Z'* of strictly exogenous control variables (instrumental variables) that is *N* x *M* because of the presence of an endogenous term in our model such that the number of the groups (*N*) will be greater than or equal to the number of the instrument (*K*). The *Z'* matrix must be strictly exogenous so that the covariance between it and the error terms is zero; that is $(E(Z' \varepsilon_{it}) = 0)$. Therefore, the *Z'* matrix is a set of valid instrumental variables assumed to be highly correlated with the explanatory variables but not with the error term.

Furthermore, v_i and μ_{it}^{π} μ_{it}^{y} are the country's specific effects which do not vary with time and the unexplained portion of the dependent

variables in models (1.7) and (1.8), respectively, hence μ_{it}^{π} and $\mu_{it}^{y} \sim IID\ (0, \sigma_{\varepsilon}^{2})$. The country's specific fixed effect disappears after the first differencing because it does not vary with time. Therefore, we arrive at the different form of models (1.7) and (1.8) thus:

$$\Delta\pi_{it} = \phi_o + \phi_1\Delta\pi_{it-1} + \phi_2\Delta y_{it-1} + \phi_3\Delta IR_{it-1} + \phi_3\Delta MS_{it-i} * ID_{it-i} + \Delta\mu_{it}^{\pi} \quad \ldots\ldots\ldots\ldots (1.9)$$

$$\Delta y_{it} = \delta_o + \delta_1\Delta y_{it-1} + \delta_2\Delta RER_{it-1} + \delta_3\Delta IR_{it-1} + \delta_4\Delta MS_{it-i} * ID_{it-i} + \Delta\mu_{it}^{y} \quad \ldots\ldots\ldots\ldots (1.10)$$

3.3 Data Measurements, Sources and Justification

This study employs annual panel data from thirty-six African countries from 1996 to 2021. The data include inflation rate, money supply growth rate, interest rate, output growth rate, real effective exchange rate and institutional development variable (Government effectiveness). These variables were sourced from different World Bank databases/World Development Indicators. The variables, measurements, sources and expected signs are presented in Table 1. These variables were selected based on the structural approach to monetary policy effectiveness. Moreover, the study examines four institutional development indicators as plausible channel as explained earlier.

Table 1: Data Measurements, Sources and Expected Sign

Data	Variable	Measurement	Sources	Expected Sign
INF (π)	Inflation Rate	Inflation Rate	World Development Indicator (WDI)	Positive
Y	Output growth Rate	The growth rate of real GDP	World Development Indicator (WDI)	Positive
IR (r)	Interest rate	Lending rate	World Development Indicator (WDI)	Negative
RER (e)	Real effective exchange rate	Real effective exchange rate	World Development Indicator (WDI)	Negative

ID	Institutional Development	A vector of Government Effectiveness, political stability, corruption control and regulatory quality.	World Development Indicator (WDI)	Positive/Negative
MS	Money Supply	Growth Rate of Broad Money	World Development Indicator (WDI)	Positive

Source: Author's Compilation

3.2 Estimation Technique

Equations (1.9) and (1.10) are the different forms of the dynamic panel models. The challenge with this model is the endogeneity problem due to the presence of the lagged dependent variables as part of the explanatory variables, which is correlated with past error terms. Moreover, the lagged dependent variable in the model (1.10) is part of the regressor in the model (1.9). This further creates the problem of endogeneity in the model. Therefore, a System Generalized Method of Moments (GMM) estimation technique was employed to analyze the data. This is because of its advantage in eliminating the problems of serial correlation, endogeneity and heteroscedasticity (Caselli et al., 2004). It can also correct for unobserved panel heterogeneity, omitted variable bias, measurement error and endogeneity problems of the lagged dependent variable (Bond et al., 2001). Moreover, the GMM estimation technique has the advantage of efficiency when the panel's cross-sectional units (N) are more than or equal to its time (T) observation. This is the case in this study, as the cross-sectional unit comprises thirty-six African economies. In contrast, the time observation spans from 1996 to 2021, a sample period of twenty-seven years.

Moreover, this study prefers the system GMM over a differenced GMM because system GMM has the advantage of reducing potential bias and imprecision associated with difference GMM estimator, and it produces more efficient parameters than those of a difference GMM when the data series has gaps (Arellano & Bover, 1995; Blundell and Bond, (1998). When there are gaps in the panel, results from the difference GMM will produce biased estimates since it subtracts previous

observations from the contemporaneous. This procedure magnifies gaps in the series. The system GMM corrects this abnormality by using orthogonal deviations. It subtracts the average of all future available observations to minimize data loss. As a result, two equations are required (i.e. the level equation and the differenced equation).

Finally, the Sargan/Hansen and AR2 tests are the specifications proposed by Arellano and Bond (1991) and Blundell and Bond (1998) used to examine the overall instruments' validity and the existence of autocorrelation in the models, respectively. This is because the independent variables are not strictly exogenous. This means that the independent variables are correlated with past and possibly current values of the error with fixed individual effects. The null hypothesis here is that all instruments as a group are exogenous. Hence a higher p-value is desirable, and secondly, the autocorrelation of the error terms (μ_{it}) of the differenced equation is not serially correlated, particularly at the second-order (AR2). Therefore, a higher p-value is also desirable. One should not reject the null hypothesis of both tests.

4.1 Results and Discussion

The output of the data analyses began with the presentation and discussion of the pairwise correlation matrix. This is necessary for this study as it will guide the researcher on the particular institutional development variable that best fits our model. To do this, the institutional development indicator/variable having the highest correlation with output gap and inflation rate is chosen as the optimal monetary policy channel. The pairwise correlation estimate results reveal that when the monetary growth rate interacts with the four institutional variables, government effectiveness shows the highest relationship on average (-0.5180) with output growth and inflation rate for the periods under consideration.[2], as presented in Table 2. Therefore, this study uses government effectiveness as a measure of institutional development. Moreover, based on the theoretical suggestions and following previous works (e.g. Effiong et al., 2020; Karras, 1999), we include the first lag of inflation and output growth in the inflation and output regressions, respectively, to capture the level of persistence. Also, we include the first

[2] The average correlation of the interaction between money supply and government effectiveness (MS*GE) with output growth rate and inflation reveals the highest relationship thus: $[(-0.0694) + (-0.9665)]/_2$

lags of the output gap and interest rate in the inflation regression, while lagged values of the real exchange rate and interest rate were included in the output regressions. The rationale is to have a parsimonious model to reduce possible over-parameterisation in experimenting with various lag structures of money growth (Effiong et al., 2020).

Table 2: Pairwise Correlation Matrix

	GDPG	Inf	RER	IR	MS	MS*GE	MS*CC	MS*PS	MS*RQ
GDPG	1.0000								
Inf	0.0391	1.0000							
RER	-0.1682*	0.6569*	1.0000						
IR	0.0151	-0.3770*	0.0501	1.0000					
MS	0.0683*	0.9898*	0.0251	-0.3840*	1.0000				
MS×GE	-0.0694*	-0.9665*	0.0766	0.3454*	-0.9860*	1.0000			
MS×CC	-0.0650*	-0.9708*	0.0817	0.3456*	-0.9879*	0.9984*	1.0000		
MS×PS	-0.0596	-0.9728*	0.0421	0.3451*	-0.9867*	0.9948*	0.9978*	1.0000	
MS×RQ	-0.0631	-0.9725*	0.0691	0.3468*	-0.9882*	0.9975*	0.9993*	0.9986*	1.0000

*Significant at 5%

Source: Authors' Estimation

First, we examined the role of different lag structures of monetary growth on the inflation rate and output growth using the baseline models of equations (1.9) and (1.10), as presented in Tables 2 and 3, respectively, before incorporating the possible effect of institutional development. This is necessary as it will guide us to understand whether monetary policy independently dampens the rate of inflation and/or promotes the output levels or not among African economies. Both inflation and growth models (models 1 - 8) show a high level of persistence, as indicated by the statistical significance of the first lag of the dependent variables in both regressions. This suggests that inflation expectations and/or individuals' rational expectations are the main drivers of inflation among African markets. In contrast, previous growth rates were the major promoter of its contemporaneous value. This result is consistent with Effiong et al. (2020), who affirmed that lagged inflation and output growth values show significant persistence in their regression.

Table 3: The Impact of Monetary Growth on Inflation Rate among African Economies

	(1)	(2)	(3)	(4)
	INF	**INF**	**INF**	**INF**
Constant	1.171	0.775	1.199	3.692
	(0.94)	(0.66)	(0.91)	(1.68)*
ΔInf_{it-1}	0.620	0.549	0.638	0.763
	(7.50)***	(6.93)***	(4.62)***	(3.92)***
$\Delta GDPG_{it-1}$	-0.089	-0.115	-0.085	-0.068
	(0.99)	(1.32)	(0.84)	(0.48)
ΔIR_{it-1}	0.153	0.141	0.125	0.149
	(2.12)**	(2.02)**	(2.85)***	(2.22)**
ΔMS_{it}	0.032	-0.008	0.012	-0.320
	(0.40)	(0.10)	(0.13)	(1.51)
ΔMS_{it-1}		0.097	0.100	0.159
		(3.38)***	(3.39)***	(3.52)***
ΔMS_{it-2}			-0.076	-0.124
			(0.58)	(0.58)
ΔMS_{it-3}				0.117
				(0.65)
Observations	222	222	222	214
Number of group(CN)/Instruments	12/9	12/10	12/11	12/11
AR2	0.563	0.059	0.121	0.735
Sargan Instrument Validity Test	0.354	0.340	0.298	0.635
The absolute value of t statistics in parentheses				
*** significant at 1%; ** significant at 5%; * significant at 10%				

Source: Authors' Estimation

For the interest rate (*IR*) and output gap (*GDPG*) in the inflation models (1 -4), their first lags have a positive and negative effect on inflation, respectively. However, the output gap was not significant. Therefore, a positive interest rate suggests that the nominal interest rate set by the monetary authority exceeds the inflation rate, which has the potential to raise the nominal interest rate, thereby dampening the inflation rate. This explains the negative effect of the output gap on inflation, which can offset the rising impact of interest rate ceteris paribus. Furthermore, the inflation models (1 - 4) reveal that the contemporaneous effects of money growth could not significantly impact the inflation rate.

In contrast, it's first lagged values do significantly raise the inflation rate. This is consistent with Friedman's theory that there is a market lag of one year in the impact of the monetary increase on the price level. He further proposed that money supply increases will not impact the price level in the long run. Our model shows that the money supply could not significantly drive inflation after the first lag. Therefore, caution should

be taken by the monetary authorities in the management of monetary policy among African markets, especially as it tends to raise the level of inflation in the next period.

Moreover, another essential aspect of this study is that since the first lags of money growth significantly raise inflation levels, particularly for models 2 - 4, it is evidence that independent monetary policy can be very ineffective among African markets in the control of inflation. This suggests that price stability in the monetary policy framework could be more of a function of interest rate than changes in the money supply. This assertion is strengthened by the significant impact of the interest rate at a 5 percent significance level on the inflation rate for the entire inflation models 1 – 4. Therefore, seeking optimal measures to improve monetary policy's workings among African economies becomes pertinent, particularly in price stability. This study proposes to develop or improve the workings of institutions which serve as a transmission mechanism in channeling the monetary aggregates, thereby dampening the inflation rate.

On the other hand, the output models (5 - 8) reveal that the first lag of output growth, interest rate and the contemporaneous and lagged values of money supply growth rate were among the variables that impact the level of output growth. In model 5, for instance, the result reveals that output lag is associated with a 22.3 percent increase in the current levels of growth during the short-run at a 1 percent significance level, ceteris paribus. Also, on model 5, one-unit increase in the interest rate and contemporaneous money growth is associated with 0.052 unit decreases and 0.125 increases in output growth during the short-run at 10 percent and 5 percent significance levels, respectively, ceteris paribus. This suggests that an expansion of the money supply will cause an increase in output growth, whereas a positive increase in the interest rate will reduce output growth. This finding is consistent with theory and previous empirical studies such as those of Effiong et al. (2020); Carranza et al. (2010); Cecchetti, S. (1999) and Karras (1999), who also found that increases in money supply raise output significantly. The magnitude of this impact can be damped when the interest rate rises but strengthened when the interest rate falls. The contemporaneous levels of monetary growth rate could not significantly impact output growth, particularly in models 6 – 8, just as it could not impact significantly the inflation rate in models 1 – 4 in the inflation regression. The absence of statistical significance of money growth, particularly for models 6 – 8, is

consistent with money neutrality in the long run. Therefore, it is important to note that the main focus of this study is not to find the contemporaneous and various lagged effects of money growth on output growth and inflation rate. However, the focus is to find the transmission effect of monetary policy/money growth through institutional quality/development on the inflation rate and output growth. In other words, we want to find out whether the effectiveness of monetary policy among African economies is improved through the development of institutions as measured by government effectiveness.

Table 4: The Impact of Monetary Growth on Output among African Economies

	(5)	(6)	(7)	(8)
	GDPG	**GDPG**	**GDPG**	**GDPG**
Constant	-5.097	-7.491	-8.350	-8.992
	(1.62)	(2.00)**	(2.14)**	(2.46)**
$\Delta GDPG_{it-1}$	0.223	0.196	0.191	0.183
	(2.90)***	(2.47)**	(2.37)**	(2.44)**
ΔRER_{it-1}	0.031	0.048	0.057	0.064
	(0.98)	(1.32)	(1.51)	(1.79)*
ΔIR_{it-1}	-0.052	-0.063	-0.065	-0.075
	(1.78)*	(1.90)*	(1.94)*	(2.34)**
ΔMS_{it}	0.125	-0.030	-0.067	-0.036
	(2.08)**	(0.26)	(0.54)	(0.30)
ΔMS_{it-1}		0.206	0.207	0.118
		(2.05)**	(2.03)**	(1.12)
ΔMS_{it-2}			0.028	0.031
			(0.89)	(1.05)
ΔMS_{it-3}				0.055
				(1.98)**
Observations	225	207	207	207
Number of group(CN)/Instruments	12/10	11/11	11/11	11/11
AR2	0.270	0.672	0.856	0.490
Sargan Instrument Validity Test	0.177	0.426	0.408	0.914
The absolute value of t statistics in parentheses				
*** significant at 1%; ** significant at 5%; * significant at 10%				

Source: Authors' Estimation

Having examined the baseline regressions of the impact of money growth on output growth and price stability and concluding that lagged values of money growth give some ambiguous results, we introduce the institutional variable (government effectiveness) as its transmission channel to monetary policy effectiveness. This effect is explicitly captured in equations (1.9) and (1.10). For the sake of simplicity, we only report results for the contemporaneous money growth, its two lags and its interaction with government effectiveness which are presented in

Table 5 for both inflation and output models. The choice of government effectiveness as a measure of institutional quality has been addressed above.

The result reveals that introducing institutional quality improves the effectiveness of monetary policy, particularly in controlling inflation. The first lag of inflation as part of the regressors still shows considerable persistence; hence, future inflation values are affected by present values and expectations of higher inflation levels. In addition, inflation expectation remains strong over time. However, the fact that the magnitude of persistence is lower when institutional development/government effectiveness is introduced in the model proves that it improves monetary policy effectiveness in price stability. Two major findings further strengthen this assertion. Consider model 9 when introducing the institutional development indicator and compare the result with model 1 without institutional variable. We found that the interest rate could significantly dampen the inflation rate at a speed of 12.2 percent per annum at a 5 percent significance level during the short-run ceteris paribus. This means that poor institutions hamper monetary policy's corrective role in price stability. Secondly, the result also reveals that monetary expansion could now significantly raise the level of inflation among African economies. However, when it interacts with government effectiveness, an institutional development variable, monetary growth significantly reduces the higher inflation rate. More precisely, in model 9, we found that a one-unit increase in monetary growth interaction with developed institutions is associated with 0.531 decreases in inflation rate at a one percent significance level during the short-run, ceteris paribus. This means that better institutions improve monetary effectiveness on the inflation rate. This conclusion is also reached in model 10, except that the inclusion of the first leg of monetary growth and its interaction with institutional development both reduces the magnitude of the impact of the real exchange rate and money growth and that of its interaction with institutional development.

Moreover, the significant positive impact of monetary growth interaction with institutional development variables in models 10 and 11 with no significant impact of its second lag is consistent with monetary neutrality in the long run. This result is also consistent with those of Carranza et al. (2010) and Cecchetti (1999), who found that monetary growth is neutral in the long run. Therefore, although institutional development improves monetary policy's effectiveness in controlling

inflation, this could only be sustained in the short run. On the other hand, this study also assessed whether institutional development variable also improves the effectiveness of monetary policy in generating higher output levels. The results are presented in models 12 – 14. The result shows that output persistence decays over time as monetary policy interacts with government effectiveness during the short run. This means that past values of output growth could no longer influence the contemporaneous output levels. This could be attributed to institutional flaws, political instability and high levels of corruption within the system. Therefore, further studies should investigate these factors' role as transmission channels of monetary policy effectiveness.

Furthermore, the result further reveals that the interest rate significantly dampens the output growth rate. This was also the case in models 5 – 8 without institutional factor effect. This suggests that the effect of institutions does not improve the impact of interest rates on output growth. Again, we found that a one-unit increase in the first leg of the monetary growth rate significantly raises output by 0.080 and 0.073 units, particularly in models 13 and 14, respectively, at a 1 percent significance level during the short-run, ceteris paribus but not at its contemporaneous level. The fact that its magnitude was more substantial in models 6 and 7 when there is no institutional effect than in models 13 and 14 with institutional effect implies that the institutional development effect on monetary policy limits its effectiveness. This explains why the first lag of the interactive effect of institutional development/government effectiveness with a monetary policy on output growth yielded a lesser significant impact on growth in its magnitude. However, there is no evidence that this impact could be sustained in the long-run as the second lag of this interaction in model 14 reveals an insignificant negative impact.

Based on the findings, the relationship between institutional development and monetary policy might translate to output growth among African economies; however, this impact might only be sustained in the short run. This result is inconsistent with those of Effiong et al. (2020), who found no statistical evidence for the relationship between financial development and monetary policy effects on output growth. Therefore, we conclude that institutional development is a better transmission channel of monetary policy effectiveness to output growth. This is because financial development is just an aspect of the entire economic structure on which output can be generated

Table 5: Institutional Development and Monetary Policy Effectiveness

	(9)	(10)	(11)		(12)	(13)	(14)
	INF	**INF**	**INF**		**GDPG**	**GDPG**	**GDPG**
Constant	-5.843	-3.109	-4.451	***Constant***	-2.549	-2.549	9.571
	(6.63)***	(3.06)***	(2.10)**		(1.10)	(1.08)	(0.75)
ΔINF_{it-1}	0.045	0.317	0.114	$\Delta GDPG_{it-1}$	-0.061	-0.069	-0.115
	(13.58)***	(5.27)***	(0.53)		(0.94)	(1.02)	(1.26)
$\Delta GDPG_{it-1}$	-0.133	-0.051	-0.072	ΔRER_{it-1}	0.027	0.010	-0.105
	(1.47)	(0.57)	(0.81)		(1.20)	(0.42)	(0.87)
ΔIR_{it-1}	-0.122	-0.110	-0.148	ΔIR_{it-1}	-0.061	-0.069	-0.052
	(2.51)**	(2.34)**	(0.85)		(2.40)**	(2.66)***	(1.54)
ΔMS_{it}	0.474	0.452	0.451	ΔMS_{it}	-0.110	0.017	0.105
	(19.73)***	(19.09)***	(11.51)***		(1.48)	(0.17)	(0.61)
$\Delta MS_{it} \times GE_{it}$	-0.531	-0.472	-0.453	$\Delta MS_{it} \times GE_{it}$	-0.160	-0.061	0.065
	(11.24)***	(6.61)***	(1.42)		(2.34)**	(0.73)	(0.40)
ΔMS_{it-1}		-0.119	0.007	ΔMS_{it-1}		0.080	0.073
		(2.28)**	(0.04)			(2.71)***	(2.37)**
$\Delta MS_{it-1} \times GE_{it-1}$		0.180	0.177	$\Delta MS_{it-1} \times GE_{it-1}$		0.039	0.039
		(4.14)***	(5.73)***			(1.71)*	(1.60)*
ΔMS_{it-2}			0.199	ΔMS_{it-2}			-0.060
			(1.22)				(0.76)
$\Delta MS_{it-2} \times GE_{it-2}$			0.224	$\Delta MS_{it-2} \times GE_{it-2}$			-0.089
			(1.23)				(0.98)
Observations	560	560	543		243	234	234
No group/ instruments	30/12	30/12	30/13		12/12	13/12	12/12
AR2 Test	0.992	0.061	0.337		0.096	0.050	0.126
Sargan Test	0.000	0.198	0.138		0.268	0.562	0.704
The absolute value of t statistics in parentheses							
*** significant at 1%; ** significant at 5%; * significant at 10%							

Source: Authors' Estimation

Finally, the Sargan instrument validity test and the autocorrelation test, particularly at order two (AR2), as proposed by Arellano and Bond (1991) and Blundell and Bond (1998), were the two specification tests used to verify whether the models are good or not. Their results reveal

that except for model 9, which could not pass the instrument validity test because the probability value of its Sargan test was significant at 1 percent, which is not desirable, the rest of the results show that our instruments are valid. There was no autocorrelation in the models. With probability values of 5 percent and above, we cannot reject the null hypothesis that all instruments are strictly exogenous. Secondly, the autocorrelation of the error terms (μ_{it}) of the differenced equation is not serially correlated, particularly at the second-order (AR2). Besides, the number of groups outnumbers the number of instruments in all our models, which is desirable.

5.1 Conclusion and Policy Recommendations

This paper investigates the impact of institutional development variables measured in terms of government effectiveness on monetary policy effectiveness among thirty-six African economies over the period 1996 - 2021. This study is motivated by the poor monetary policy management among most African economies and the need for empirical evidence on the role of institutions in monetary policy effectiveness among African economies. The researchers adopted the IS-LM open economy framework to model forward-looking/dynamic growth and inflation equations to be estimated. The study employed the generalized method of moments (System GMM) estimation technique to investigate this study's objectives due to the endogeneity problem in our models.

We found strong evidence of the impact of institutional development on monetary policy effectiveness for price stability but a weak relationship between the institutional variable and monetary policy on output growth only during the first lag. This implies that whereas a developed institution could be a transmission channel through which monetary policy promotes price stability, monetary policy might directly impact output growth due to its direct impact on credit and investment. This assertion is strengthened by the strong persistence of the first lag of output growth in the growth models 5-8. This conclusion is reached after various robustness checks of different lag structures. Effiong et al. (2020) believe otherwise that financial development does not translate to monetary policy effects on output growth. This study criticized this conclusion because financial development represents a minute aspect of the economic structure upon which monetary policy operates. Therefore,

institutional development is a better transmission channel and a better result.

Again, the result also found evidence to support the monetary neutrality hypothesis as lags of monetary growth rate could not significantly impact output growth and inflation rate beyond its first lag and the contemporaneous levels though with ambiguous results. This intensifies the need for the transmission channel of institutional development. Meanwhile, the inability of monetary growth to continuously transmit to growth through institutional development is blamed on the poor/undeveloped network of institutions with its attendant structural limitations. Therefore, this study recommends better monetary transmission to growth and price stability through the control of corruption, political stability and regulatory quality among African markets, as that will foster greater confidence among investors and ensure a smooth diversification of idle funds with minimal capital loss and greater returns, thereby ensuring greater output and stable prices.

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