Monetary policy effectiveness in Africa: the role of financial development and institutional quality

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Abstract

Purpose – This study aims to provide empirical evidence of the pass-through effect of monetary policy on bank lending rates *vis-à-vis* the potential moderating effects of financial sector development and institutional quality in Africa.

Design/methodology/approach – The study uses robust fixed effects panel data estimation techniques and data from 1990 to 2017 across 37 countries in Africa.

Findings – The results show that financial development aids in the effectiveness of monetary policy transmission. A decomposition of financial development into financial institution development and financial market development shows that financial institutional development is more influential with regard to effectiveness of the interest rate pass-through compared to financial market development. This study again shows that improvements in the quality of institutions reduced lending rates in African economies.

Practical implications – The findings present relevant policy implications regarding effective transmission of monetary policy, by linking the pursuit of institutional quality, characterized by the control of corruption, political stability, regulatory quality, rule of law and the voice of accountability and development of financial institutions with lending rates and ultimately the demand for growth capital.

Originality/value – This study contributes to the literature on the factors influencing the effectiveness of monetary policy. This study considers financial sector development and institutional quality as conduits to monetary policy effectiveness in developing African countries.

Keywords Financial development, Monetary policy, Institutional quality, Lending rates

Paper type Research paper

1. Introduction

In the last two decades or so, the role of financial development in the pursuit of economic agendas has attracted a significant portion of the academic and policy literature. This research interest has been kindled mostly by the notion that "finance leads growth" – a hypothesis that seems to be winning the argument with most economists, despite the fact that the debate on the finance–growth nexus still rages on. Over the years, a number of studies that are devoted to financial development has identified its level as a key ingredient in the pursuit of economic agendas, including policy effectiveness (Gigineishvili, 2011; Seth and Kalyanaraman, 2017). According to Aghion *et al.* (2009), financial development is

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beneficial to economic performance at sufficiently high levels. This benefit, they argue, works through the capacity of highly developed financial sectors to shield economies from the negative effects of volatility that may stem from unfavorable shocks to the economy.

In linking the value of financial development to the theory on convergence, Aghion *et al.* (2009) further argue that any country that attains a certain critical level of financial development will ultimately converge to the growth rate of the world technology frontier. In following with the obviously important role that the level of financial development seems to play in the quest for growth, it has also been hypothesized that the effectiveness of economic policies in stimulating an economy toward its desired growth target is also influenced by the level of financial development. In essence, the question brought to the fore by this hypothesis is whether the effectiveness of economic policy, say monetary policy, is an attribute of the level of financial development in an economy? Effectiveness of monetary policy, in this instance, is captured as the fullness and speediness of pass-through of monetary policy to target variables like inflation, aggregate demand and market interest rates.

In answer to such questions and related ones on macroeconomic performance, a number of studies have also sought to measure the effectiveness of monetary policy transmission (Saborowski and Weber, 2013). Some have argued that there is a link between the effectiveness of monetary policy in an economy and the level of financial development that has been attained by the economy in question. In fact, a number of such studies have concluded in one way or the other that the pass-through of monetary policy is dependent on the level of financial development: the structure, the level of competition, the stages of financial development, among other characteristics (Cottarelli and Kourelis, 1994; Krause and Rioja, 2006; among others). Others have also made a case for the moderating role of institutional quality in the pursuit of monetary policy effectiveness. Indeed, Mauro (1995), Li *et al.* (2000) and Acemoglu *et al.* (2003) show that the quality of institutions determines, to a large extent, the impact of economic policies and thus the existence of cross-country variations. Despite this, the extant literature on institutions rarely considered the effect of institutional quality on the monetary transmission mechanism, especially in developing countries. One of the few studies, Huang and Wei (2006), assess the role of institutional quality, proxied by corruption, on the effectiveness of monetary policy. Their study alludes to the idea that weak institutional quality weakens the autonomy of monetary authority and erodes the credibility of the central bank and thus makes monetary policy ineffective. Evidently, institutions are important to monetary policy goal achievements in developed countries, but the issue of African economies arguably remains unexplored.

While studies linking monetary policy effectiveness to the level of financial development do not necessarily abound, they seem even more limited for a region like Africa, a region that is in dire need of answers to its growth issues, ineffective policies and quality of institutions. This study is therefore one such attempt at filling this research gap, by empirically documenting, for the region, the relationship between the level of financial development and monetary policy effectiveness, given the implications of effective monetary policy for savings, investment and growth.

Studying the African region is particularly relevant at this time. The region presents a very opportune setting because of its quest for a unified monetary union. In this regard, the assertion by De Bondt (2000) that the viability of a monetary union is partly dependent on member states' responsiveness to monetary policy makes such a study even more pertinent and timely. This study thus seeks to highlight possible and relevant policy issues that may need to be addressed in the quest for a successful single monetary policy framework.

As argued by Gigineishvili (2011), knowing what factors drive market responses and bank behavior (via lending rates) to central bank actions would have valuable implications

for strengthening monetary policy effectiveness. This knowledge could also provide important input for the choice of a monetary framework, including intermediate targets and policy instruments, and help identify measures that are needed to improve it. The study thus contributes to literature on Africa by testing the moderating effects of financial development and institutional quality on the effectiveness of monetary policy. Also, owing to the importance of banks in the African financial system and their role in the transmission of monetary policy, the bank interest rate pass-through is a key issue for central banks.

By examining the relationship between the level of financial development, institutional quality and monetary policy effectiveness, the findings of this study hold relevant implications as regards the effectiveness of monetary policy for the region and how financial development and institutional quality may be harnessed in the pursuit of policy effectiveness. With the burgeoning arguments for monetary convergence, the effectiveness of monetary policy, given the presence of financial sector development and institutional quality, is deemed relevant.

The remainder of the paper is structured as follows. Section 2 briefly reviews the extant literature. Section 3 presents the methodological framework adopted in the study. Section 4 analyzes the findings of the study. And finally, Section 5 concludes the paper.

2. Literature review

2.1 Monetary policy effectiveness

The concept of monetary policy effectiveness has gained a lot of research traction in recent times as economies around the globe continue to search for ways to improve the effectiveness of economic policy in general. The importance of monetary policy effectiveness has increased specifically on account of the need to determine whether central banks, of both developing and developed countries, can exert strong and systematic effects on aggregate demand through monetary policy. Policy, in this setting, is considered effective when it is capable of influencing a predetermined target in the manner and intensity intended.

Testing for the effectiveness of monetary policy, despite having been around for a while, has mostly focused on identifying which of the traditional transmission mechanisms of monetary policy is prominent in a particular economic setting without much attention to the catalytic factors such as financial development and institutional quality among others. While monetary policy effectiveness seems visible as regards developed economies (Mishra *et al.*, 2011), the same cannot be necessarily said of developing economies. For the developed economies, for instance, the interest rate channel of monetary transmission is perceived as the most effective, whereas the bank-lending channel is believed to work for developing economies (Mishra *et al.*, 2011). The bank-lending channel seems to be considered the route for effective monetary policy in developing countries because these economies are mostly bank dependent, while lacking the other frameworks, namely, bond markets, stock markets, etc., on which the other transmission mechanisms are deemed to work.

According to Mishra and Montiel (2013), though a significantly large literature has emerged in recent years with a focus on the empirical measurements of the effects of monetary policy on aggregate demand and price levels, the beneficiaries have been mostly advanced economies. They go on to intimate that most of these studies have tended to confirm the effectiveness of monetary policy in influencing aggregate demand and prices, but are quick to add that there are strong reasons to believe that similar effects may not necessarily hold for countries with fundamentally different financial structures. This general conclusion has kindled research interest into the determinants of monetary policy effectiveness as opposed to merely the identification of transmission mechanisms. Of the determinants in literature, levels of financial development have received significant attention.

2.2 Monetary policy effectiveness, financial development and institutional quality

The effectiveness of monetary policy, as a research agenda, has been around for some decades now. The focus of such studies, however, has been on identifying the most effective monetary transmission mechanism at work in (any) particular economy(ies). Over the years, it has emerged from most of these studies that traditional monetary transmission mechanisms such as the credit channel and the interest rate channel operate through the financial system (Carranza *et al.*, 2010). This suggests that the financial system is crucial to the effectiveness of the monetary transmission mechanism. Carranza *et al.* (2010) go on further to indicate that, this difference in pass-through notwithstanding, the theoretical and empirical literature has largely ignored the relationship between financial development and monetary policy effectiveness. This is even so in spite of the wide variations that have existed in the structures of financial systems across countries for decades now.

The proposition to determine the effects of the financial system on the monetary transmission mechanism, interestingly, seems to have been raised much earlier by Allen and Gale (1995) and Cottarelli and Kourelis (1994). Allen and Gale (1995) believed that insights into the financial structure of economies were of crucial importance because it had large potential effects on economic efficiency, in general, and monetary policy transmission, specifically. Cottarelli and Kourelis (1994) furthered this argument by also arguing that the effectiveness of monetary policy hinged on a "set of structural parameters not directly controlled by central banks," one of which was obviously the level of financial development. De Bondt (2000) later also buttressed this need to look into the relationship between financial development and monetary policy effectiveness by intimating that the imperfection of financial markets gives an essential role to the financial structure in the monetary transmission mechanism. Financial development *vis-à-vis* monetary transmission has only recently received the needed attention as a result of the need to identify means of enhancing the effectiveness of monetary policy.

The empirical literature, which has been far and in between, has mostly concluded that the level of financial development is crucial to the effectiveness of monetary policy. One of the pioneering works in this area was by Cottarelli and Kourelis (1994). They concluded that differences in interest rate pass-through in the Euro zone can be explained by differences in their financial structures: banking system competition, extent of developments in the money markets, ownership structure of banking institutions and barriers to foreign competition (Mojon, 2000). Cecchetti (1999) corroborated the significance of financial development in monetary policy effectiveness by also reporting that "countries with many small and less healthy banks with poorer access to direct capital displayed greater sensitivity to monetary policy changes than did countries with big healthy banks and deep well-developed capital markets."

In another study of 21 countries by Lastrapes and McMillin (2004), they found that where the financial markets were developed and allowed economic agents to easily rebalance their portfolios in reaction to monetary policy shocks, the liquidity effect of monetary policy was subsequently weaker. In a relatively larger study of 37 industrialized and developing economies by Krause and Rioja (2006), the finding was that a more developed financial market significantly contributed to a more effective monetary policy implementation, irrespective of whether the economy was a developed or a developing one. This finding is a contradiction to Cecchetti (1999) and Lastrapes and McMillin's (2004) negative relationship between financial development and monetary policy effectiveness. Sørensen and Werner (2006) also found that competition within the banking sector, a characteristic of developed financial markets, was positively significant in explaining a speedier pass-through for the policy interest rate. In a study by Carranza *et al.* (2010), it also emerged that while monetary policy has a larger cumulative impact when financial systems are less developed, there are

significant time lags between implementation and impact, while for developed economies, the experience was that of a speedier pass-through for monetary policy.

Some studies have also considered how financial uncertainty, including the possibility of crises may affect the effectiveness of monetary policy. For instance, Pellegrino (2021) reports that historical effectiveness of monetary policy shocks is inversely correlated with the level of uncertainty at the time of the shock, and that there is evidence of weaker real effects of monetary policy shocks during uncertain times compared to tranquil times. Lien *et al.* (2021) and Castelnuovo and Pellegrino (2018) document similar results, concluding that monetary policy is less effective when uncertainty is high than in normal times. The rationale is that high uncertainty causes agents to postpone decisions, awaiting more precise information or more pressing needs, and this cautiousness makes them less responsive to changes in the economic environment, including the interest rate (Aastveit *et al.*, 2017). In addition, Williams (2012) notes that crises impact the ability of monetary policymakers to achieve their objective of price stabilization, as they bring about additional shocks and factors, which affect inflation and output. In normal times, defaults and bank failures may be minimal, adequate liquidity is made available to businesses and monetary policy focuses on addressing shocks to inflation and output. But when crises occur, defaults and bank failures increase, liquidity dries up and shocks to the financial sector may affect the transmission of monetary policy. Even so, this dimension lies outside the scope of this study and may be considered in a future study.

On the issue of institutions, the economic benefits of stronger institutions have also been well-established in literature (Acemoglu *et al.*, 2001). Institutional quality affects overall economic growth by enhancing the underlying factors for economic activity. Developments in institutional economics suggest that institutions affect the conduct, transmission and cyclical properties of monetary policy that in turn affect overall economic activity (Huang and Wei, 2006; Ullah *et al.*, 2016). Similarly, Al-Marhubi (2000), using a cross-country regression, concludes that higher corruption corresponded with higher inflation levels, making monetary policies ineffective in achieving economic targets such as price stability. In a related study, Duncan (2014) also suggests that developed countries exhibit strong institutions and a positive output–interest rate correlation, while emerging market economies tend to show weak levels of institutional quality accompanied with negative (or zero) output–interest rate correlations. Contrary to the positive effect seen in some studies, other studies indicate that economies with better legal protection for shareholders and debtors generally have a less effective monetary transmission (Cecchetti, 1999; Djankov *et al.*, 2007). These arguments provide the motivation to test the moderating role of institutional quality on monetary policy effectiveness.

In general, the scant empirical literature definitely lends itself to the idea that financial development is key to determining the effectiveness of monetary policy. The impact, however, could be facilitative or dampening. In one dimension, a well-developed financial system provides the structures for the transmission of policy to the economy, thus contributing to effectiveness. In another dimension, well-developed financial markets could also provide insulation against monetary policy shocks by providing numerous media/innovations by which economic agents can counter the effects flowing from monetary policy shocks. This ambiguity in direction and the fact that most of these studies are limited to the advanced economies still leave open the question: how does financial development and institutional quality affect the effectiveness of monetary policy transmission, and in this particular case, for Africa?

3. Methodology and data

This section details the approach to this study. It touches on the empirical model, data types and sources as well as the model estimation.

3.1 Hypothesis and empirical model

The basic generalization from the literature presupposes that the efficacy of monetary policy, as a stabilization tool, is influenced in a large part by the strength and reliability of the linkage between instruments of monetary policy and the target economic variable. The strength and reliability of this linkage, according to Opolot and Nampewo (2014), is also in part dependent on the country's financial architecture: the size, the composition of the formal financial sector, the degree of development of money and capital markets and the quality of institutions. Based on the foregoing, this study seeks to test the idea that "the effectiveness of monetary policy is dependent on the financial development and institutional quality characteristics within an economy."

In testing for the efficacy of monetary policy in an economy, many studies have relied on the strength and speed of the traditional transmission mechanisms (Gigineishvili, 2011). The common feature of all the transmission channels is that they transmit policy decisions to aggregate demand and/or supply through financial markets. To test for the pass-through of monetary policy for the countries under study, a modified loanable funds theory and cost-of-funds approach are used. In following with Mojon's (2000) study on the varying impact of financial structure on the strength of the interest rate channel, this study models monetary policy effectiveness as also being dependent on financial development.

Data used in this study are primarily gathered from the World Development Indicators and the International Monetary Fund Database. The period is from 1990 to 2017 across 37 countries in Africa.

This study uses panel estimation techniques to assess the impact of the monetary policy pass-through via financial development and institutional quality on economic variables. The general panel framework is as follows:

$$Y_{i,t} = \alpha_{i,j} + BX_{i,t} + \gamma_{t,j} + \varepsilon_{i,t} \tag{1}$$

where subscript i denotes the cross-sectional dimension (country); $i = 1, \ldots .N$ and t denotes the time series dimension (time); $t = 1, \ldots, T$; and $Y_{i,t}$is the dependent variable. $\alpha_i$is scalar and constant for all periods (t) and specific to country fixed effect (i); B is a $k \times 1$ vector of parameters to be estimated on the explanatory variables or parameter estimates for the explanatory variables. $X_{i,t}$ is a $1 \times k$ vector of observations on the explanatory variables, which comprises of the input variables in the model, including control variables. $\gamma_{t,j}$ is the time fixed effect t. $\varepsilon_{i,t}$ is the error term.

3.2 Estimation strategy

This study uses panel data models to test the effectiveness of monetary policy on the cost of funding as follows:

$$lr_{i,t} = \beta_0 + \beta_1^{mp} MP_{i,t} + \beta_2^{fd} FD_{i,t} + \beta_3^{mpfd} (MP \times FD)_{i,t} + \beta_{1j}^{iq} IQ_{i,t} + \sum_{j=1}^{n} \beta_{1j}^{x} X_{i,t} + \varepsilon_{i,t}^{lr} \tag{2}$$

$$lr_{i,t} = \gamma_0 + \gamma_1^{mp} MP_{i,t} + \gamma_2^{fd} FD_{i,t} + \gamma_3^{iq} IQ_{i,t} + \gamma_4 (MP \times IQ)_{i,t} + \sum_{j=1}^{n} \gamma_{1j} X_{i,t} + \varepsilon_{i,t}^{lr} \tag{3}$$

where i indexes over countries and t over time; the βs and γs are coefficients. lr represents the lending rate or the cost of borrowing. MP, FD and IQ are measures of monetary policy,

financial development and institutional quality, respectively. Interaction terms are included in each model above to assess the moderating or pass-through effect of monetary policy on the cost of funds. X denotes the set of control variables. $\varepsilon_{i,t}$ is the error term, which can be decomposed to show both the time and country fixed effects.

3.3 Definition of variables

This subsection explains the variables used in this study. This shows the constituents of each variable and their likely impacts in the estimations.

3.3.1 Lending rates (lr). This is the dependent variable and is measured as the average annual bank lending rate in each economy. The effectiveness of monetary policy (MP) is reflected in the response of bank rates to changes in MP.

3.3.2 Monetary policy (MP). Measured by broad money (M2) in this study, monetary policies are fundamental to the determination of the cost of funds and payments of interests on deposits. Expansionary or contractionary monetary policies are shown in literature to influence major economic variables and the financial architecture of economies (Peersman, 2002). This measure of monetary policy is expected to have a negative relationship with lending rates. Literature shows that increased liquidity in the markets reduces the demand for credit thus reducing interest rates as a reaction to decreased demand (Ellingsen and Soderstrom, 2001).

3.3.3 Financial development (FD). Development in the financial sector better facilitates economic policies in reaching economic goals. Previous studies indicate that better financial structures insulate the economy against shocks. Our measures of financial development are credit to private sector as a percentage of gross domestic product (GDP) and other financial development indices. Depth, access and efficiency of financial institutions and markets are the various dimensions of financial development adopted in this study to measure their individual contribution to monetary policy effectiveness.

3.3.4 Institutional quality (IQ). Two indices of institutional quality are considered in this study. First is the International Country Risk Guide (ICRG) index, which focuses on government stability, socioeconomic conditions, investment profile, conflict, corruption, law and order and democratic accountability (Duncan, 2014). The study uses three proxies from the ICRG index: government stability, corruption and law and order, which are deemed to have a supportive conduit for monetary policy effectiveness. Second is the measures of institutional quality from the World Governance Indicators (WGI): control of corruption, political stability, regulatory quality, the rule of law and the voice of accountability are used. Following the literature (Agbloyor *et al.*, 2016; Chong and Calderon, 2000; Kunčič, 2014), the average of these indices is used to measure the quality of governance in the countries under study.

3.3.5 Control variables (X). Relevant to models specified in equations 2 and 3 above, other variables are included as control variables. These are meant to capture variations in defining the dependent variables that may not be explained by the main variables of interest. Following Sander and Kleimeier (2004) and Gigineishvili (2011), we control for GDP growth, exports to GDP and foreign direct investment (FDI). Growth in an economy is likely to affect the cost of loans due to increased demand for credit facilities. Exports measure economic openness, which in turn spurs the supply of credit at interest rates that improve returns for the supply side. The presence of FDI calls for changes in interest rates as funds are provided to support investments and thus a high expected return on loan facilities advanced.

4. Empirical results and discussions

This section presents the findings and discussions of this study. Table 1 is the summary statistics of the variables used in this study. The table shows an average lending rate of 22% across all countries. Financial development indices are mostly less than 0.5. These indicators, financial institutions: depth, access, efficiency; and financial market: depth, access and efficiency, equally averaged less than 0.5. Growth in the GDP averaged 4.2%, whereas the contribution of FDI to the overall GDP averaged 3.97%. The choice of economic openness from exports as a control variable shows a mean of 31.5% of GDP implying fairly open economies. Another variable of interest, institutional quality measured by the average of government quality indices from WGI: control of corruption, political stability, regulatory quality, the rule of law and the voice of accountability, is averaged as 30.69%. This measure of institutional quality is ranked in percentiles.

The study conducts a Pearson's correlation matrix that checks the existence and control of multicollinearity and is shown in Table A1 in the Appendix. Though some collinearity coefficients were seen as greater than 0.5, the results from the variance inflation factor (VIF) (Table A3 in Appendix) indicate the absence of multicollinearity that may render biases in the estimations of the models.

The study uses fixed effect estimations after carrying out the Hausman specification test (see Table A4 in the Appendix). Previous research indicates that there is a long-run relationship between lending rates and monetary policy rates. For this reason, we settle on the use of broad money as a proxy for monetary policy to avoid spurious regressions in the results from the model. Again, following Im *et al.* (2003), we perform cointegration tests to affirm the nonexistence of long-run relationship between lending rates and the choice of monetary policy variable for this study. These tests are presented in Table A2 of the Appendix. The null hypothesis of the existence of unit root is rejected for lending rates.

The results are presented in Tables 2 to 5. The results in Table 2 show the negative and significant effect of monetary policy, proxied by broad money, across various measures of financial development. The results here support existing literature that money supply reduces the demand for money through borrowing thus reducing the cost of loans (Mojon, 2000). The results further include and alternate the measures of financial development in their aggregate forms such as credit to private sector as a percentage of GDP and financial

Table 1.
Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
LNR	839	22.118	51.382	4.737	117.5
BroadMoneytoGDP	1309	34.619	27.93	2.857	251.618
FDIndex	1277	0.14	0.095	0.002	0.627
FinInstIndex	1277	0.234	0.127	0.003	0.739
FinMktIndex	1117	0.05	0.089	0	0.586
FinInstDepth	1277	0.111	0.157	0.002	0.884
FinInstAccess	1254	0.087	0.129	0.001	0.862
FinInstEfficy	1277	0.529	0.171	0.004	0.966
FinMktDepth	1117	0.064	0.108	0	0.83
FinMktAccess	497	0.106	0.171	0.001	0.628
FinMktEfficy	439	0.066	0.106	0	1
FinCrdPrv	1302	31.124	37.573	−72.994	219.539
GDPgrth	1346	4.214	8.143	−62.076	149.973
Fdi	1346	3.97	9.281	−82.892	145.202
Export	1348	31.509	20.078	0	158.266
AvIQ	931	30.698	18.604	1.182	77.48

development index. The estimates from these measures of financial development are inconclusive and insignificant. However, disaggregating the measure of financial development exhibits some significant results. The financial institutional development index covering depth, accessibility and efficiency shows a negative and significant effect on lending rates, whereas financial market indices were insignificant. This implies that financial institutional development in Africa is related more to interest rates than equity market development. This is expected, as financial intermediation in most African countries is bank based (Beck and Maimbo, 2012). From the foregoing, increased credit facilities, increased branches and ATM usage, which characterize access to financial institutions and improved efficiencies, allow financial institutions' lending rates to respond to monetary policies.

The results exhibited in Table 3 show mainly negative and significant effects of money supply on lending rates with various measures of institutional quality. The effectiveness of monetary policy in the presence of institutional quality and the various measures thereof are also evaluated in Table 3. Despite the scanty nature of literature among institutional quality, monetary policy and lending rates, these results throw some light on the relationships. The negative relationship depicted in literature between money supply and lending rates is replicated in Table 3. The effect of institutional quality on lending rates is predominantly seen as negative in this table. Improved law and order, political stability, the existence of the rule of law, regulatory quality and voice of accountability all prove to have a negative and significant relationship with lending rates. This is indicative of creditor and investor protection in economies with high levels of institutional quality as indicated in previous studies (Gani and Al-Muharrami, 2016; Kapounek, 2016).

Table 4 includes the interaction terms of monetary policy and measures of financial development. This captures the impact of financial development on the effectiveness of transmission of money supply on lending rates. The results indicate that monetary policy is more effective in determining lending rates in economies with the presence of financial sector development. The coefficients in models 22 and 24 in table 4 are positive and significant, whereas other models from the financial development and monetary policy interactions do not yield significant results. The interaction of money supply and aggregate financial institution index shows a positive and significant effect on lending rates. Also, the interaction of depth of financial institutions with the monetary policy measure yields a similar result. This is indicative of the argument that increased financial sector development would result in increased sensitivity of lending rates to changes in money supply.

The results are similar to what is indicated in previous literature (Carranza *et al.*, 2010). This finding is not exclusive to the development of financial institutions but could include equity market development as well, despite the insignificance of coefficients of interactions of disaggregated financial market indices. This implies that increases in the overall financial sector development can improve the effectiveness of monetary policy transmission in lending rates in the economies under study.

The pass-through effect of monetary policy via institutional quality is reported in Table 5. The marginal effect of improvement in the institutional quality on the monetary policy transmission to lending rates is seen as positive across various measures of institutional quality. From the results (models 28, 30, 31, 34 and 35), increased institutional quality will further help in the determination of lending rates from monetary policy changes. Government effectiveness, control of corruption, the rule of law and the voice of accountability are measures of institutional quality that provide positive interaction

Table 2.
Monetary policy effectiveness amid measures of financial development

Variables	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7	(8) Model 8	(9) Model 9	(10) Model 10
BroadMoneytoGDP	−0.149*	−0.249***	−0.209***	−0.339***	−0.508***	−0.140*	−0.246***	−0.355***	−0.182	−0.177***
	(0.0793)	(0.0773)	(0.0806)	(0.0757)	(0.0734)	(0.0772)	(0.0678)	(0.0775)	(0.186)	(0.0586)
FinCrdPrv	0.000449									
	(0.0363)									
AvIQ	−0.552***	−0.354***	−0.354***	−0.362***	−0.368***	−0.321***	−0.375***	−0.361***	−1.165***	−0.473***
	(0.152)	(0.0983)	(0.0981)	(0.107)	(0.0959)	(0.0973)	(0.0979)	(0.107)	(0.326)	(0.111)
GDPgrth	−0.190	0.149	0.140	0.146	0.141	0.0661	0.173	0.143	0.819**	0.0174
	(0.189)	(0.140)	(0.139)	(0.154)	(0.136)	(0.139)	(0.139)	(0.154)	(0.362)	(0.145)
Fdi	0.0357	0.373***	0.358***	0.387***	0.293***	0.314***	0.351***	0.380***	0.845***	0.196*
	(0.112)	(0.108)	(0.107)	(0.116)	(0.106)	(0.107)	(0.107)	(0.116)	(0.243)	(0.105)
Export	0.319***	0.241***	0.231***	0.247***	0.239***	0.214***	0.236***	0.242***	0.304***	−0.0170
	(0.0815)	(0.0541)	(0.0541)	(0.0595)	(0.0527)	(0.0537)	(0.0537)	(0.0595)	(0.114)	(0.0414)
FDIndex		−30.20								
		(20.54)								
FinInstIndex			−32.51**							
			(15.37)							
FinMktIndex				−0.181						
				(17.13)						
FinInstDepth					87.94***					
					(16.75)					
FinInstAccess						−51.41***				
						(12.98)				
FinInstEfficy							−19.97***			
							(6.597)			
FinMktDepth								6.783		
								(10.55)		
FinMktAccess									−13.23	
									(20.30)	
FinMktEfficy										−7.646
										(5.721)
Constant	32.06***	33.15***	35.71***	32.20***	25.13***	29.97***	40.01***	32.34***	49.38***	43.50***
	(6.519)	(4.773)	(5.051)	(4.963)	(4.412)	(4.346)	(5.395)	(4.958)	(12.55)	(4.954)
Observations	560	529	529	472	529	529	529	472	209	212
R-squared	0.068	0.142	0.146	0.143	0.184	0.165	0.154	0.144	0.214	0.156

Table 3. Monetary policy effectiveness amid measures of institutional quality

Variables	(1) Model 11	(2) Model 12	(3) Model 13	(4) Model 14	(5) Model 15	(6) Model 16	(7) Model 17	(8) Model 18	(9) Model 19
BroadMoneytoGDP	−0.136	−0.145	−0.168**	−0.157*	−0.160**	−0.172**	−0.171**	−0.151*	−0.0966
	(0.0908)	(0.0885)	(0.0838)	(0.0801)	(0.0801)	(0.0792)	(0.0799)	(0.0797)	(0.0824)
FinCrdPrv	0.0477	0.0477	0.0383	0.0180	0.0143	−0.00467	0.0177	0.0106	−0.00771
	(0.0399)	(0.0362)	(0.0360)	(0.0364)	(0.0365)	(0.0364)	(0.0362)	(0.0363)	(0.0372)
InstGovtStab (ICRG)	0.0934								
	(0.602)								
GDPgrth	−0.315	−0.355*	−0.277	−0.279	−0.278	−0.211	−0.286	−0.248	−0.219
	(0.230)	(0.189)	(0.189)	(0.190)	(0.190)	(0.188)	(0.188)	(0.189)	(0.190)
Fdi	0.190	0.147	0.179	0.0432	0.0334	0.0364	0.0586	0.0431	−0.0156
	(0.142)	(0.131)	(0.131)	(0.114)	(0.114)	(0.112)	(0.114)	(0.113)	(0.114)
Export	0.0878	0.125	0.137	0.320***	0.320***	0.312***	0.309***	0.324***	0.331***
	(0.0978)	(0.0903)	(0.0889)	(0.0824)	(0.0824)	(0.0814)	(0.0821)	(0.0819)	(0.0819)
InstCorr (ICRG)		−0.256							
		(1.274)							
InstLawOrd (ICRG)			−4.168***						
			(1.429)						
InstGovEff (WDI)				−0.159					
				(0.114)					
InstConCorr (WDI)					−0.141				
					(0.109)				
InstPolStab (WDI)						−0.292***			
						(0.0754)			
InstRegQual (WDI)							−0.289**		
							(0.115)		
InstRulofLaw (WDI)								−0.341***	
								(0.120)	
InstVoiAcc (WDI)									−0.407***
									(0.138)
Constant	20.79***	21.38***	34.18***	18.47***	18.61***	24.85***	23.85***	24.76***	26.54***
	(6.328)	(5.817)	(6.301)	(5.367)	(5.595)	(5.042)	(5.789)	(5.675)	(5.996)
Observations	517	575	577	560	560	560	560	560	560
R-squared	0.016	0.020	0.036	0.047	0.047	0.071	0.055	0.059	0.060

Table 4.
Interactions – financial development and monetary policy (M2/broad money)

Variables	(1) Model 20	(2) Model 21	(3) Model 22	(4) Model 23	(5) Model 24	(6) Model 25	(7) Model 26
BroadMoneytoGDP	−0.140	−0.342***	−0.337***	−0.350***	−0.350***	−0.232***	−0.203
	(0.106)	(0.0957)	(0.110)	(0.0842)	(0.0852)	(0.0843)	(0.142)
FinCrdPrv	0.00418						
	(0.0470)						
FDCRPRV_MP1	−0.000113						
	(0.000904)						
AvIQ	−0.550***	−0.345***	−0.341***	−0.362***	−0.344***	−0.356***	−0.357***
	(0.153)	(0.0983)	(0.0981)	(0.107)	(0.0977)	(0.0985)	(0.0987)
GDPgrth	−0.188	0.148	0.144	0.145	0.150	0.138	0.153
	(0.191)	(0.139)	(0.139)	(0.154)	(0.139)	(0.141)	(0.140)
Fdi	0.0355	0.380***	0.366***	0.391***	0.371***	0.365***	0.369***
	(0.113)	(0.108)	(0.107)	(0.116)	(0.107)	(0.109)	(0.108)
Export	0.319***	0.239***	0.229***	0.248***	0.243***	0.240***	0.240***
	(0.0816)	(0.0540)	(0.0540)	(0.0597)	(0.0537)	(0.0542)	(0.0542)
FDIndex		−72.72**			−61.36***	−24.55	−25.76
		(32.90)			(23.36)	(23.27)	(23.59)
FinInstIndex			−56.33***				
			(20.80)				
FI_MP1			0.438*				
			(0.259)				
FinMktIndex				−12.00			
				(41.09)			
FM_MP1				0.138			
				(0.435)			
FIDep_MP1					0.530***		
					(0.194)		
FIAcc_MP1						−0.0945	
						(0.182)	
FIEff_MP1							−0.0736
							(0.192)
Constant	31.70***	38.65***	40.97***	32.81***	37.47***	32.35***	32.54***
	(7.112)	(5.813)	(5.917)	(5.333)	(4.997)	(5.021)	(5.034)
Observations	560	529	529	472	529	529	529
R-squared	0.068	0.146	0.151	0.143	0.155	0.142	0.142

Variables	(1) Model 27	(2) Model 28	(3) Model 29	(4) Model 30	(5) Model 31	(6) Model 32	(7) Model 33	(8) Model 34	(9) Model 35
BroadMoneytoGDP	−0.234*	−0.381***	−0.357*	−0.412***	−0.447***	−0.170*	−0.206**	−0.400***	−0.369***
	(0.124)	(0.112)	(0.183)	(0.104)	(0.101)	(0.0969)	(0.0887)	(0.108)	(0.120)
FinInstIndex	−33.55	−40.34**	−29.28	−35.68**	−39.00**	−22.19**	−32.28**	−36.41**	−40.09**
	(21.67)	(19.57)	(20.18)	(15.28)	(15.26)	(15.39)	(15.64)	(15.35)	(15.91)
AvIQ	−0.669***	−0.627***	−0.654***	−0.507***	−0.521***	−0.314***	−0.350***	−0.507***	−0.407***
	(0.175)	(0.146)	(0.152)	(0.109)	(0.106)	(0.112)	(0.105)	(0.114)	(0.102)
InstGovtStab_MP1(I)	−0.00335								
	(0.00841)								
GDPgrth	0.379*	0.239	0.245	0.113	0.140	0.142	0.140	0.134	0.124
	(0.229)	(0.174)	(0.175)	(0.138)	(0.137)	(0.139)	(0.139)	(0.138)	(0.139)
Fdi	0.420**	0.374**	0.384**	0.340***	0.361***	0.355***	0.359***	0.350***	0.370***
	(0.171)	(0.152)	(0.153)	(0.107)	(0.106)	(0.108)	(0.108)	(0.107)	(0.107)
Export	0.235***	0.237***	0.236***	0.225***	0.212***	0.233***	0.231***	0.210***	0.216***
	(0.0733)	(0.0671)	(0.0681)	(0.0536)	(0.0536)	(0.0541)	(0.0541)	(0.0544)	(0.0546)
InstCorr_MP1(I)		0.0906***							
		(0.0330)							
InstLawOrd_MP1(I)			0.0329						
			(0.0442)						
InstGovtEff_MP1(W)				0.00529***					
				(0.00173)					
InstConCorr_MP1(W)					0.00694***				
					(0.00183)				
InstPolStabMP1(W)						−0.000994			
						(0.00135)			
InstRegQual_MP1(W)							−0.000123		
							(0.00145)		
InstRulofLaw_MP1(W)								0.00520***	
								(0.00199)	
InstVoiAcc_MP1(W)									0.00433*
									(0.00241)
Constant	47.11***	45.53***	45.56***	41.91***	41.87***	34.23***	35.60***	41.74***	39.29***
	(7.612)	(6.759)	(6.851)	(5.404)	(5.239)	(5.439)	(5.235)	(5.523)	(5.418)
Observations	363	399	399	529	529	529	529	529	529
R-squared	0.175	0.184	0.169	0.162	0.170	0.147	0.146	0.157	0.151

Table 5.
Interactions – institutional quality and monetary policy (M2/broad money)

coefficients with money supply. The ICRG measure of corruption shows a positive interaction coefficient as well. This implies that increased corrupt activities increase the monetary policy effect on lending rates, in essence, increasing the cost of funds. This shows that corruption erodes the goals of economic policies.

The control variables used in the models mostly exhibit positive and significant coefficients in relation to the lending rate. However, GDP growth in all the models but models 12 and 27 exhibited no significance. The implications deduced from this is that increased economic activities are avenues for an increase in the demand for loans for which the cost of funding is increased. In the presence of various financial sector development indices, FDIs are positive and significant through models 2 to 9. The coefficient of exports as well are positive and significant through most of the models. This implies that credit facilities sought after to support increased trade levels increase the cost of funds.

To confirm the findings of the fixed effect estimations, we use Prais–Winsten regression, correlated panels corrected standard errors (PCSEs) which accounts for heteroscedasticity, autocorrelation or cross-sectional correlation. The results (presented in Table A5 in the Appendix) show that monetary policy has a negative relationship with lending rates and more effective given the development of the financial sector.

For robustness checks, the study equally assesses the level of financial sector development as well as the quality of institutions that aid in the effectiveness of monetary policy. The study recreates a dummy variable that captures high and low financial sector development (presented in model 36) and high and low institutional quality (presented in model 37) in Table A6 of the Appendix. The results show that the effectiveness of monetary policy is largely seen in less financially developed economies. This is intuitive as economies with less developed financial sector are characterized as bank-based which is fundamental for the pass-through effect of monetary policies. The results from the robustness checks do not show the effect of the variation in the levels of institutional quality as significant. The findings are thus consistent, reliable and efficient.

5. Conclusions

The study sought to find the role of financial sector development and institutional quality in the effectiveness of monetary policy in Africa. The effectiveness of monetary policy was examined on the lending rates of the countries involved.

Using panel estimation techniques, the findings show a negative effect of monetary policy, measured by broad money or money supply on lending rates. This finding implies that increased supply of money by central banks reduces the demand for loans, which inadvertently pushes down the cost of funds. The findings also indicate that the overall growth in the financial institutions sector drive down lending rates. This is intuitive as fund seekers may have access to funding from other sources, with improved accessibility, depth and efficiency of financial institutions. This study again assesses the effects of the existence of institutional quality on lending rates in Africa. The results on this indicate that institutional quality improvements reduce lending rates in African economies.

The results of this study have important policy implications. This study has shown that improved financial institutions and institutional quality aid the effectiveness of monetary policy. Thus, the pursuit of improved financial sector development and institutional quality characterized by control of corruption, political stability, regulatory quality, rule of law and the voice of accountability is advised among regulators and policymakers to contribute to the reduction of cost for fund seekers. This subsequently affects the aggregate output of less developed economies spurring economic growth.

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Appendix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) LNR	1.000	–	–	–	–	–	–	–	–
(2) BroadMoneytoGDP	−0.175	1.000	–	–	–	–	–	–	–
(3) FDIndex	−0.215	0.662	1.000	–	–	–	–	–	–
(4) FinCrdPrv	0.004	0.590	0.680	1.000	–	–	–	–	–
(5) GDPgrth	−0.136	−0.078	−0.010	−0.096	1.000	–	–	–	–
(6) PerCgdp	−0.101	0.278	0.430	0.083	0.007	1.000	–	–	–
(7) Fdi	0.004	−0.068	−0.047	0.039	0.232	−0.011	1.000	–	–
(8) Export	0.084	0.101	0.218	−0.075	0.139	0.458	0.206	1.000	–
(9) AvIQ	−0.154	0.350	0.614	0.295	0.020	0.242	−0.046	0.085	1.000

Table A1. Pairwise correlations

Ho: All panels contain unit roots — Number of panels = 38
Ha: Some panels are stationary — Avg. number of periods = 22.08

AR parameter: Panel-specific — Asymptotics: T,N → Infinity
Panel means: Included sequentially
Time trend: Not included

ADF regressions: No lags included

	Fixed-N exact critical values				
	Statistic	p-value	1%	5%	10%
t-bar	−5.4439		(Not available)		
t-tilde-bar	−1.7891				
Z-t-tilde-bar	−3.1834	0.0007			

Table A2. Im-Pesaran-Shin unit-root test for lending rates

LNR	VIF	1/VIF
FDIndex	4.440	0.225
FinCrdPrv	2.940	0.341
BroadMoneytoGDP	2.450	0.408
AvIQ	1.720	0.583
Export	1.340	0.747
FDI	1.080	0.924
GDPgrth	1.050	0.955
Mean VIF	2.140	

Table A3. VIF

chi2(6) = (b − B)'[(V_b-V_B)^(−1)](b-B)	Coef.
Chi-square test value	5.926
P-value	0.431

Table A4. Hausman (1978) specification test

Table A5.
Prais–Winsten Regression, correlated PCSEs

LNR	Coef.	Std. Err.	*t*-value	*p*-value	[95% Conf	Interval]	Sig
BroadMoneytoGDP	−0.363	0.089	−4.09	0	−0.537	−0.189	***
FDIndex	−38.734	21.512	−1.80	0.072	−80.896	3.429	*
c.BroadMoneytoGDP#∼x	0.859	0.32	2.68	0.007	0.231	1.486	***
AvIQ	−0.298	0.086	−3.46	0.001	−0.467	−0.129	***
GDPgrth	0.117	0.153	0.76	0.446	−0.184	0.417	
Fdi	0.164	0.202	0.81	0.416	−0.232	0.561	
Export	0.375	0.102	3.69	0	0.176	0.574	***
Constant	31.308	2.568	12.19	0	26.275	36.34	***

Mean dependent var	16.356	SD dependent var	14.725
R-squared	0.491	Number of obs	529.000
Chi-square	143.529	Prob > chi2	0.000

Notes: ***$p < 0.01$, **$p < 0.05$ and *$p < 0.1$

Table A6.
Policy effectiveness in high and less developed financial sector and institutional quality

Variables	(1) Model 36	(2) Model 37
BroadMoneytoGDP	−0.103	−0.170
	(0.101)	(0.128)
1.lessdevelopedfd	9.693**	
	(3.693)	
0b.lessdevelopedfd#co.BroadMoneyofGDP	0	
	(0)	
1.lessdevelopedfd#c.BroadMoneyofGDP	−0.211*	
	(0.107)	
FDIndex	−47.77**	−46.62**
	(20.00)	(19.12)
GDPgrth	0.0162	0.0737
	(0.344)	(0.360)
Fdi	0.479	0.445
	(0.319)	(0.319)
Export	0.0353	0.0356
	(0.0712)	(0.0618)
1.highIQ		3.388
		(3.067)
0b.highIQ#co.BroadMoneytoGDP		0
		(0)
1.highIQ#c.BroadMoneytoGDP		0.0247
		(0.0827)
Constant	23.86***	25.96***
	(2.672)	(4.224)
Observations	694	694
R-squared	0.075	0.079