

RESEARCH ARTICLE

WILEY

Does informal banking influence monetary policy transmission? Some empirical evidence for Ghana

Richard Kwabi Ayisi 

Economics, University of Ghana College of Humanities, Accra, Ghana

Correspondence

Richard Kwabi Ayisi, Economics, University of Ghana College of Humanities, Accra, Ghana.
Email: ayisi0@gmail.com

Abstract

Informal banking activities have been increasing in many economies in recent times. These activities, though are interrelated with the formal banking activities, fall within a different regulatory framework within which the central bank conducts monetary policy. This has a potential effect on monetary transmission. The study, thus, investigated this issue in the Ghanaian perspective using the local projection approach. Using data sourced from the World Bank and Bank of Ghana databases, the study estimated an incomplete monetary pass-through for Ghana. Notwithstanding this, informal banking further weakens the pass-through. Other factors such as non-performing loans, excess liquidity and the level of financial development were identified to weaken the pass-through. These findings highlight the need for a prudent monetary framework that can address the challenge informal banking bring forth in monetary policy implementation.

KEYWORDS

Ghana, informal banking, interest rate pass-through

JEL CLASSIFICATION

E52; E54; G210

1 | INTRODUCTION

Monetary policy, following the pioneer work of Friedman and Schwartz (1963), has remained an integral part of modern theoretical and empirical economic research. Particularly because, monetary policy remains the major tool used by government of various countries to achieve their economic objectives of growth, stable general price level, favourable interest rate and exchange rate. Its importance in developing economies stabilization policy is more immersed since it remains the only viable policy instrument especially when the alternative—fiscal policy—is found often to represent a source of macroeconomic shocks, which aggravate the effect of exogenous shocks (Mishra, Montiel, & Spilimbergo, 2010).

The Banking sector is integral in the conduct of monetary policy. Particularly because, the banking sector serve as the mediator that transmits monetary impulses from the policymaker to the real economy. Banks play this role through their relationship with the real sector, and the central bank via regulatory frameworks such as the capital requirement and reserve requirements among others. The banking sector, in recent times however, has evolved into two types of institutions—the formal bank type that relates with the central bank on the reserve framework and the informal bank type which does not.

There are evidences of formal¹ banks co-existing with large informal banks in African, Asia and other part of the world. Studies show that the informal financial sector is large and growing (Chipeta and Mkandawire (1991); African development report (1994); Aryeetey (1994);

Chipeta (1998)). The pace of growth of the informal sector even outweighs that of the formal sector. This is established by field surveys carried out in Malawi by Chipeta and Mkandawire (1991), in Ghana by Aryeetey (1994), and in Nigeria by Soyibo (1997). The informal sector growth is also reflected in its share of total credit intermediation, which constitute about 40% of the total financial system (IMF Financial Stability Board, 2014 report).

Although data is sparse, anecdotal evidences suggest similar trend in Ghana. For example, the amount of loans extended by Non-Bank Financial Institutions (NBFIs) increased from GHc70.63 million in 2003 to GHc72.85 million in 2004, suggesting 3.1% growth. In 2006, a total of GHc160.47 million was extended to clients, which represents 48.8% higher than the previous year's total loans and advances granted by these micro-finance institutions. The upward-trend of NBFI's credits to individuals, small businesses, groups and others indicate marked improvements in the level of micro-finance and the gradual growth in total financial assets in the country. Overall, figures from Bank of Ghana indicate that the share of micro-finance loans and advances as a percentage of total assets of banks and NBFI loans and advances has increased from 4.8% in 2008 to 9.8% in 2013.

The share and size of informal banking, and their interaction with formal banking, may cause formal bank response to policy actions from the central bank to be non-trivial, with the consequent effect on economic activities not obviously determined. The response may vary depending on whether informal banks are autonomous or reactive to formal banks (Rahman (1992); Rahman (1994)); whether the two sub-sectors exist as complementary or competitive; and whether the nature of their interaction frustrates or strengthens monetary policy. Unfortunately, the literature is silent on the role of informal banking in the monetary transmission process. An important question that remain unanswered is does informal banking activities mar or ease monetary transmission?

Ngalawa and Vieg (2013) attempted to answer the above question, however theoretically. The study investigated the interaction of formal and informal financial markets and their impact on economic activity in quasi-emerging market economies. Using a DSGE model, the study showed that interest rates in the formal and informal financial sectors do not always change together in the same direction to a response to policy. The study demonstrated that in some instances, interest rates in the two sectors change in diametrically opposed directions with the implication that the informal financial sector may frustrate monetary policy, the extent of which depends on the size of the informal financial sector.

Thus, the larger the size of the informal financial sector the lower the likely impact of monetary policy on economic activity. The findings from this study suggest that informal banking activities may frustrate monetary transmission. In spite of this revelation, this phenomenon has not been investigated empirically. Therefore, this paper contributes to the literature on monetary transmission by empirically investigating the effect of informal banking activities on monetary transmission.

Using the local projection approach, the study revealed a low pass-through suggesting that monetary transmission is very weak in Ghana. This notwithstanding, the study established that informal banking activities further dampens the pass-through estimates. The findings of the study suggest that informal banking is a potential threat to effective monetary policy.

Following this introduction, the rest of the paper is structured as follows. Section 2 presents the financial structure of Ghana and discusses its implication for the conduct of effective monetary policy in Ghana. Sections 3, 4, 5, and 6 present the conceptual framework, empirical strategy, results and discussion, and conclusion and policy recommendation for the study respectively.

2 | THE STRUCTURE OF THE GHANAIAN BANKING SYSTEM AND ITS IMPLICATION FOR THE ROLE OF BANKS IN MONETARY TRANSMISSION

The Ghanaian banking industry consists of two main institutions: deposit and non-deposit taking institutions, as shown in Figure 7. The deposit taking institutions are allowed to both collect deposits in the form of savings from surplus spending agents and similarly advance credit facilities to deficit spending agents in the economy. This category of institution include the universal banks (commercial banks), non-bank financial institutions (NBFIs), rural and community banks (RCBs) and savings and loans companies and some micro-finance institutions.

The non-deposit taking institutions do not have the privilege to accumulate deposit from surplus spending agents, rather they only provide financial services that extends credit facilities to deficit spending agents in the economy. These institutional categories include the finance houses, leasing companies, forex bureau, credit bureau and some micro-finance.

Financial services are provided either in a formal or informal channel. By the formal channel, financial services are provided through the universal banking activities, thereby, corroborating our definition of the universal

bank as the formal sector. On the other hand, the micro-financing institutions provide financial services informally in the economy, hence constituting the informal sector. The micro-finance is further categorized into formal, semi-formal and informal. The formal sector comprises of Rural Banks, Savings and Loan (S&L) companies and Credit Unions. Rural Banks are public companies owned by communities (with capitalization assistance from the BOG), registered and licensed as unit banks. They, however, do not have branching privileges under the provisions of the Banking Law. Their operations are also limited to a well-defined geographical (rural) area and are permitted to offer banking services limited to loans and to chequing, savings and time deposits.

The savings and loans Companies are registered and licensed under the NBFi Law and are permitted to offer banking services limited to loans, savings and time deposits and unlike the Rural Banks, they have branching privileges.

The informal sector is mainly made of money lenders and Susu collectors.² The susu collectors provide safe-keeping services for the savings collected and they are not allowed to provide loan services from the money collected. However, clients are able to access “loans” from their own Susu collectors in the form of “advance draw-downs” against the total amount of savings they have contracted to deposit weekly for a set period. In most cases, these advances have been made possible by commercial and development banks, rural banks, and S&L companies with which the Susu collectors deposit the saving funds they collect and manage. The Susu collec-

tors help mobilize the savings for the clients and form an integral part of the financial system in Ghana. Money-lenders, rotating savings and credit associations (ROSCAs) and accumulating savings and credit associations (ASCAs) also constitute the informal segment of the market for micro-finance in Ghana.

The banking industry has seen significant developments over the last few years. Evolving from just three main banks at independence, the banking system as at end of March 2016 comprised the Bank of Ghana, 29 Universal banks, 139 rural and community banks (RCBs), 61 NBFIs, and 555 MFIs. Table 1 shows the developments of the respective banks between the period 2012 and 2016. As evident from the table, the industry has witnessed phenomenal growth, and also the emergence and significant growth of the micro-finance industry.

The industry has not only increased in number of institution, but also in total assets. Total assets of the industry at the end of March 2016, was GHc76.27 billion, up by 18.8% over the period of March 2015 level of GHc64.16 billion. Within the period, total assets of the universal banks formed 84.7%, the NBFIs held 10.1% while the RCBs took up 3.5% and MFIs 1.7% of the industry assets. Tables 2 and 3 shows the statistics.

The composition and development in the assets of the banking industry signals favourable inter and intra sector competitions. The increase in the number and assets of banks signal some level of competition among banks. The degree of market concentration as measured by assets of the top five banks has fallen steadily overtime. The total advances held by the top five banks have also fallen. Figures from the BoG database suggests that the

TABLE 1 Classification of the banking industry

Type	March-2016	March-2015	March-2014	March-2013	March-2012
Banks	29	27	27	27	27
NBFIs	61	57	57	52	50
RCBs	139	139	140	136	135
MFIs	555	337	135	-	-
TOTALS	784	560	560	214	212

TABLE 2 Asset classification of the banking industry

Type	March-2016 GHc million	March-2015 GHc million	March-2014 GHc million	March-2013 GHc million	March-2012 GHc million
BANKS	64,556.76	55,087.22	39,128.47	27,996.11	22,935.56
NBFIs	7,722.92	5,803.23	4,236.20	2,768.55	1,914.19
RCBs	2,672.53	2,160.59	1,832.89	1,559.38	1,149.20
MFIs	1,316.19	1,113.87	342.47		
TOTAL	76,268.39	64,164.91	45,520.24	32,324.04	25,998.96

Type	March-2016 Share (%)	March-2015 Share (%)	March-2014 Share (%)	March-2013 Share (%)	March-2012 Share (%)
BANKs	84.7	85.9	86.0	86.6	88.2
NBFIs	10.1	9.0	9.2	8.6	7.4
RCBs	3.5	3.4	4.0	4.8	4.4
MFIs	1.7	1.7	0.8		
TOTAL	100	100	100	100	100

Source: Bank of Ghana database.

TABLE 3 Share classification of the banking industry

total advances of the top five have declined marginally from 42.5% in 2010 to 41.5% in 2013. Deposits, however, have increased from 46.7% to 48.2%.

Although competition in the banking sector has improved over the years, there are several reasons to question the extent to which banks actually compete. While bank concentration appears to be moderate by the sub-region's standards, market power still concentrates among few dominant banks. Competition between banks in Ghana can be said to be very low, because more than 60% of the assets of the banking sector are owned by at most four banks. In 2003, the three largest commercial banks accounted for 55% of total assets of the banking sector.

By the year 2008, the dominant state-owned bank (GCB) enjoyed a substantial market power, with 20% of total deposits and 44% of total branches—a situation that may influence price setting among banks and distort competition. This situation changed after the takeover of The Trust Bank (TTB) by Ecobank Ghana. However, the top five banks still hold about 45% of the industry's assets.

Empirical studies conducted on the level of competition in the banking sector confirm low level of competitions with the possible existence of monopolistic behaviour. Buchs and Mathisen (2005) found evidence of non-competitive market structure in the Ghana banking system. This evidence was further confirmed by Biekpe (2011). The study identified very high overhead cost and economic of scale among the key factors which indirectly serves as barriers to entry, hence hampering competition among banks.

Though the banks compete marginally among themselves, recent trends as showed in Tables 2 and 3 indicate increasing competition between banks and non-bank financial institutions. The increase in micro-finance institution in the country over the years is reflected in the share of micro-finance loans in both the loan and deposit market. From Table 3, the share of micro-finance loans and advances as a percentage of total assets of banks and NBFI has been increasing. From a percentage share of 4.8% in 2008, the share of (NBFI, RCBs, & MFIs) loans

and advances have increased to 15.3% as the end March 2016. This trend indicates that MFI intermediation is gaining momentum in Ghana.

The above discussions conclude on low level of intra-sector competition among the universal banks with few major banks holding unto the industry's assets. However, the universal banks face some competition from the micro-finance sector, as indicated in the increasing share of micro-finance credit the total bank assets.

3 | CONCEPTUAL FRAMEWORK

3.1 | Some conjectures on the role of informal banks in monetary policy transmission

We hypothesize that the structure of the Ghanaian banking industry as described in Section 2 is likely to influence the response of formal banks' interest pricing to monetary policy.

Relevant to the pricing decision of banks is competition. Intra-sector competition among banks engenders efficiency, causing banks to respond to monetary signals from the central bank. This consequently leads to smooth monetary transmission. From the descriptions in the above section, the development in the banking industry is likely to enhance competition. Hence, banks are likely to respond favourably to monetary signals from the central bank, thereby enhancing monetary transmission.

Even though, competition in industry is required and good, given the different regulatory environment the various institutions operate, inter-sector competition is likely to affect the pricing decisions of the banking sector. As noted, the formal banking sector operates under a legal framework different from that of the non-banks and micro-finance institutions.

In the provisions of the Non-bank Financial Institutions Act, 2008 (Act 774) and the Banking Act, 2004 (Act 673) as amended by Act 738, the universal banks are required to keep reserves with central bank, whereas NBFI and MFIs are not mandated to do so. Not

withstanding this, both universal banks and NBFIs are deposit taking institutions, with no clear defined market segment for them.

Therefore, the inter-sector competition (i.e., competition between universal banks and NBFIs in the deposit and loan market) has the tendency to influence how universal banks respond to monetary signals from the central bank. This is because, when the central bank raises its policy rate, it does not affect informal interest rate directly. Therefore, borrowers can switch credit demand to the informal banks in response to potential higher interest rates in the formal system. The potential shift in credit demand from formal bank to informal banks could cause retail interest rates in the formal system to be less responsive to policy rate, consequently affecting the interest rate transmission.

Therefore, we hypothesize from the aforementioned that the rivalry between the formal and informal banks in the credit market affects how interest rates responds to policy change. How valid would this assertion be is the focus of this study.

4 | EMPIRICAL STRATEGY

The Vector Auto-Regression (VAR) and Auto-Regression Distributed Lag (ARDL) modelling approaches remain the techniques used in the literature to identify structural shocks and simultaneously recover corresponding impulse response (IR) that estimate pass-through. However, the local projection (LP) by Jordà (2005) has increased in popularity due to its non-parametric IR estimation approach.

This study used the LP approach to estimate the pass-through because, the method does not impose any underlying dynamics on the variables in the system as in the case for the VAR. This confers a number of advantages, such as, a technique that is more robust to mis-specification, does not suffer from the curse of dimensionality inherent to VARs, and can more easily accommodate nonlinearities,

In its basic formulation, the LP approach consists in running a sequence of predictive regressions of a variable of interest on a structural shock for different prediction horizons. The IR is then given by the sequence of regression coefficients of the structural shock.

To begin, a VAR model specified as a dynamic of Y_t is defined by a transition equation given by

$$\omega(L)Y_t = c + v_t \quad (1)$$

where v_t is a vector of noise, c a constant term, Y_t is an $M \times 1$ vector of retail rates and the policy rate, and $\omega(L)$ is a conformable lag polynomials of finite order d .

The Wold representation helps derive the impulse response functions which is estimated iteratively by rewriting VAR(p) into its companion form (i.e., a VAR(1)):

$$\begin{aligned} IR(0) &= \omega^{-1} \\ IR(0) &= \Phi^1 \omega^{-1} \\ IR(0) &= \Phi^2 \omega^{-1} \\ &\dots \end{aligned}$$

where the matrix Φ contains the coefficients of the VAR(1).

According to Jordà (2005) the impulse response can be estimated with the ordinary least squares (OLS) regressions for each forecast horizon:

$$Y_{t+k} = \alpha^k + \gamma_1^k Y_{t-1} + \dots + \gamma_p^k Y_{t-p} + \varepsilon_{t+k}^k, k = 0, 1, \dots, K-1, \quad (2)$$

where α^k is a vector of constants, and γ_i^k are parameter matrices for lag p and forecast horizon k . The vector elements ε_{t+k}^k are autocorrelated and/or heteroscedastic disturbances. The collection of all regressions of Equation (2) are the LPs.

To estimate the pass-through coefficients, the lending rate is modelled as a function of its own regressors and the lag of the policy rate. The model is given as

$$\begin{pmatrix} 1 & 0 \\ \delta_1^0 & 1 \end{pmatrix} \begin{pmatrix} \Delta i_t \\ \Delta r_t \end{pmatrix} = \sum_0^t \begin{pmatrix} w_{11} & w_{12} \\ \delta_{11}^1 & \delta_{12}^1 \end{pmatrix} \begin{pmatrix} \Delta i_{t-1} \\ \Delta r_{t-1} \end{pmatrix} + \begin{pmatrix} v_t \\ u_t \end{pmatrix} \quad (3)$$

$$\delta_{pq}^1 = \alpha_{pq}^1 + \theta_{pq}^1 X_t. \quad (4)$$

i_t is the policy rate, and r_t is the retail rate. The estimated pass-through coefficients are generated from the local projection approach.

4.1 | Data

The study used monthly data points sampled over the period 2005 to 2013 for two endogenous and five exogenous variables. The endogenous variables are the monetary policy rate (MPR) and the commercial base rate (BR)—representing the retail lending rate of the formal banks. Following the objective of the study, we used the Share of micro-finance and non-bank loans to the total bank and non-bank loans (hereafter NBLR) as the ratio that captures the proportion of informal credit

TABLE 4 Data description

Variable	Frequency	Proxy	Source
Monetary policy rate (MPR)	Monthly	Policy rate	BoG
Commercial base rate (BR)	Monthly	Retail lending rate	BoG
Non-performing loans (NPLR)	Annual	Asset quality	WDI
Liquidity reserve (LR)	Annual	Liquidity ratio	WDI
Private credit to GDP (DCP)	Annual	Financial development	WDI
Share of MFI and NBF loans to Total Bank and NBF loans (NBLR)	Annual	Informal intermediation	BoG

intermediation in total credit intermediation. This ratio represents the effect of informal banking activities in the credit market. The other exogenous variables are the private credit to GDP, liquidity ratio and non-performing loan which are used as proxies for financial development, liquidity reserves and asset quality respectively. The sources of data are from Bank of Ghana and World Bank databases.

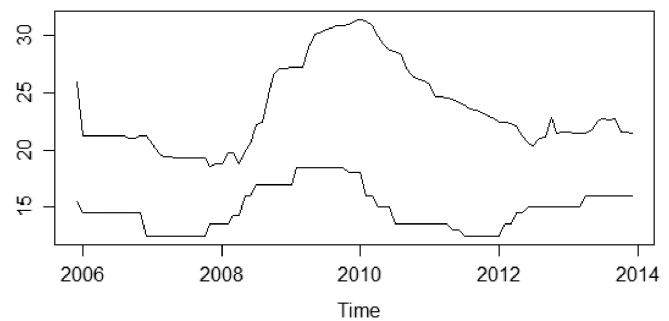
We sourced the MPR and BR at monthly frequency and the structural characteristics at annual frequency, because, the structural variables are only available at annual frequency. However, the annual data were linearly interpolated to monthly frequency.³ We acknowledge that, though the interpolation could have some potential influence on the estimates, we guide against this by ensuring that the variance in the data structure is minimized, and also, the time series properties of the data is not immensely affected. The description of the data is further explained in Table 4.

5 | RESULTS AND DISCUSSION

5.1 | Exploratory analysis

We began by showing the variations in the endogenous variables—the monetary policy rate and retail lending rate. Figure 1 shows the series are not static, rather changing overtime in response to the dynamics of the economy. The graph shows a co-movement between the policy rate and the retail, which corroborates the significant positive correlation coefficient of 60% presented Table 5.

We further decomposed the policy rate changes into positive and negative changes representing an increase and decrease in policy rate respectively.⁴ Table 5 shows that the correlation between the retail rate and positive policy rate change is greater than that of a negative change. Also, while the correlation with a positive change is statistically significantly, that of a negative change is insignificant. This

**FIGURE 1** Graph of series**TABLE 5** Covariance analysis

Policy rate		Retail lending rate
Default MPR_t	Covariance	4.1645
	Correlation	0.5981
	<i>p</i> -value	.0000***
Negative change MPR_t^-	Covariance	−0.1567
	Correlation	−0.0135
	<i>p</i> -value	.8953
Positive change MPR_t^+	Covariance	4.3212
	Correlation	0.3557
	<i>p</i> -value	.0003***

***Indicates $p > 1\%$ for H_0 no correlation.

suggests that the policy rate only contributes to an increase in interest rate but not a decrease. Thereby, suggesting that interest rates are rigid downwards in Ghana and that, monetary authorities cannot reduce the high interest rates with policy rate. The section that follows presents the formal econometric analysis.

5.2 | Estimating the pass-through

To ascertain the pass-through estimates, the study estimated an LP with a lag length of four.⁵ The LP is used to

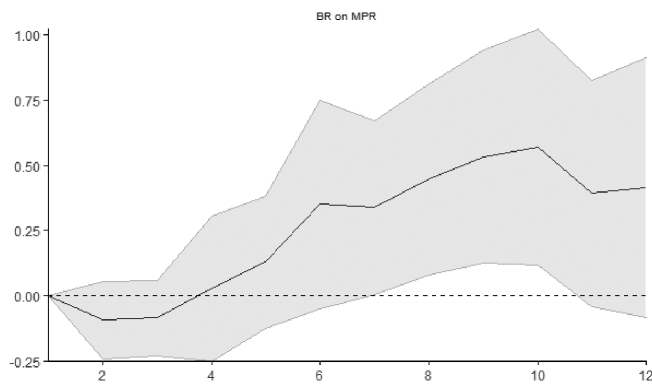


FIGURE 2 IRF of retail lending rate to policy rate

generate an impulse response function identified using the Choleski ordering. Figure 2 shows the impulse response function to one standard deviation shock with 95% confidence bandwidth drawn around the point estimates. The long pass-through is estimated at 0.56. The full long-run pass-through materializes after about the tenth months (approximately three quarters) with about 90% of the estimates materializing after 8 months.

The estimated long-run pass-through shows incomplete pass-through. This is consistent with other empirical studies that focused on developing economies.⁶ The estimate is consistent with the estimated values for countries that share similar characteristics with Ghana. The incomplete long-run pass-through gives indications that the central bank of Ghana has weak influence on the retail pricing of commercial banks.

5.3 | Determinants of pass-through

To identify the determinants of pass-through, the model in Equation (3) is estimated separately by adding to set X_t , one at a time, the economic characteristics postulated to influence pass-through. By this specification, the conditional coefficient estimates imply that the retail rate is not only a function of its own lags and the policy rate, but also, it includes the interaction terms between all these regressors and the structural characteristic in set X_t . Thus, the transmission from the policy rate to the lending rate is a function of the structural characteristics X_t .

To assess the impact of the respective characteristic on the pass-through estimates, the study contrasts the impulse response function generated from the simple model without the structural characteristics with that of the model with the structural characteristic. The IRF is then evaluated to identify whether the pass-through increases, decreases or remains unchanged with the introduction of the structural characteristic.

Figure 3 shows the IRFs for both the unrestricted and fully-restricted model.⁷ The figure shows that the

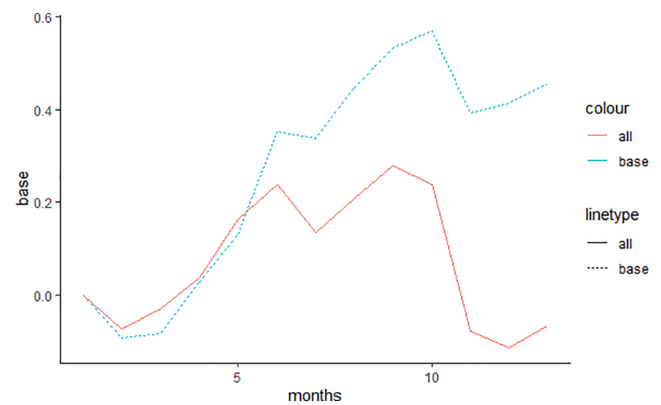


FIGURE 3 IRF: Variations with all determinants. ^a “base” is the IRF generated for the fully restricted model while “all” is the IRF of the fully unrestricted model [Colour figure can be viewed at wileyonlinelibrary.com]

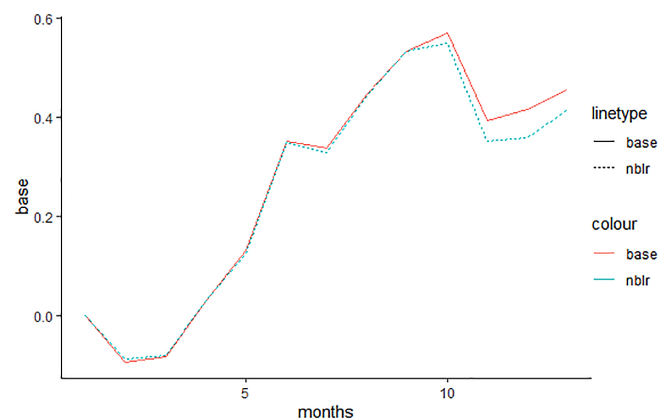


FIGURE 4 IRF: Variation with informal intermediation. ^aThe figure “base” is the IRF generated for only the endogenous variable while the figure “nblr” is the IRF of the unrestricted model with informal credit intermediation [Colour figure can be viewed at wileyonlinelibrary.com]

combined effect of informal credit, financial development, and liquidity ratio reduce pass-through estimates by 0.32, decreasing the pass-through estimate from 0.56 to 0.24. The graph shows that whereas it takes approximately 10 months for the long run estimates to fully materialize in the restricted model, it takes about 8 months for the unrestricted model. This suggests that the pass-through is weakened by the presence of these characteristics.

The assessment of the individual characteristics as suggested by the results is thus espoused below:

5.3.1 | Informal credit intermediation

The main goal of the study is to investigate informal banking activities as a potential determinant of pass-

through with its possible impact on monetary transmission. As hypothesized in the conceptual framework, the potential rivalry between formal and informal credit in a consumer's credit basket can affect pass-through. That is, informal credit serving as an alternative to formal credits, creates real, or potential competition between informal banks and formal banks. This real or potential competition restricts formal banks to respond to policy rate changes. This is because, rather than passing on the full burden of cost (increase in policy rate) to customers in the form of higher retail prices, formal banks accommodate proportional amount due to the fear that consumer will shift to informal banks who provide similar services. By means of this, informal banking reduces pass-through estimates. The share of MFI and NBF loans to total bank and NBF loans (NBLR) is used to capture the rivalry between the types of credit facing the consumer.

Figure 4 presents the IRF contrasting the fully restricted model to an unrestricted model with proxy for informal banking as the only structural characteristics in the set X_t . As showed in Figure 4, informal banking reduces long-run pass-through estimates from 0.56 to 0.53. This shows that informal intermediation restrict formal banks to fully pass on policy shock to retail prices, however, the extent is marginally.

The above result is, however, plausible for a policy rate increase. On the contrary, a decrease policy rate might not have the same effect. When policy rate decreases, formal banks can decrease the lending rate to gain a competitive advantage over informal banks. This is because, they are privileged to extra funds from the central bank. By implication, a policy rate decrease should result in higher pass-through than a policy rate increase.

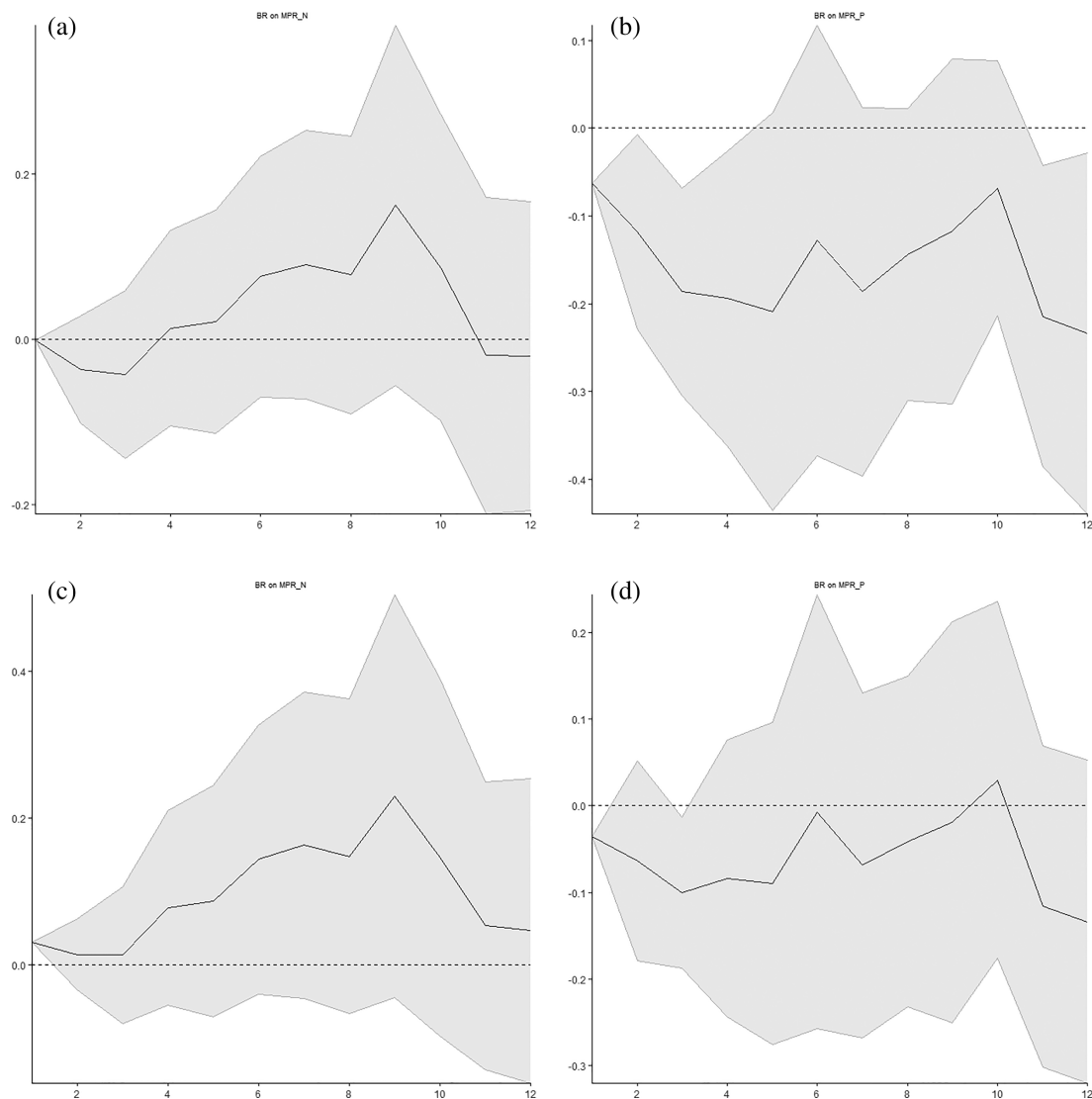


FIGURE 5 Asymmetry IRFs. ^aFigure (a) is the IRF generated for negative changes while (b) is the IRF generated for a positive change

To investigate this asymmetry, the study decomposed the policy rate into positive change and negative change representing increase and decrease in policy rate respectively. The study then estimated the pass-through for each change and analysed the effect of informal banking on the respective pass-through estimate. Figure 5 presents the IRF for the asymmetry model.

The study estimated the pass-through to be 0.029 and 0.23 respectively for a positive change and

negative change. The results further revealed that whereas informal banking reduces the pass-through estimates by 0.07 to 0.16 for a negative policy change, the effect on a positive policy change is 0.09. This finding contrasts the theoretical expectation that the presence of informal banking should cause pass-through to change by greater margin for a negative change than a positive change. Following a negative policy change, the formal banks with competitive advantage are

FIGURE 6 IRF variation with structural characteristics.
^aThe figure “base” is the IRF generated for the model with only endogenous variable while the figure “dcp” is the IRF of the model with financial development. ^bThe figure “base” is the IRF generated for the model with only endogenous variable while the figure “nplr” is the IRF of the model with Asset Quality. ^cThe figure “base” is the IRF generated for the model with only endogenous variable while the figure “lr” is the IRF of the model with liquidity ratio [Colour figure can be viewed at wileyonlinelibrary.com]

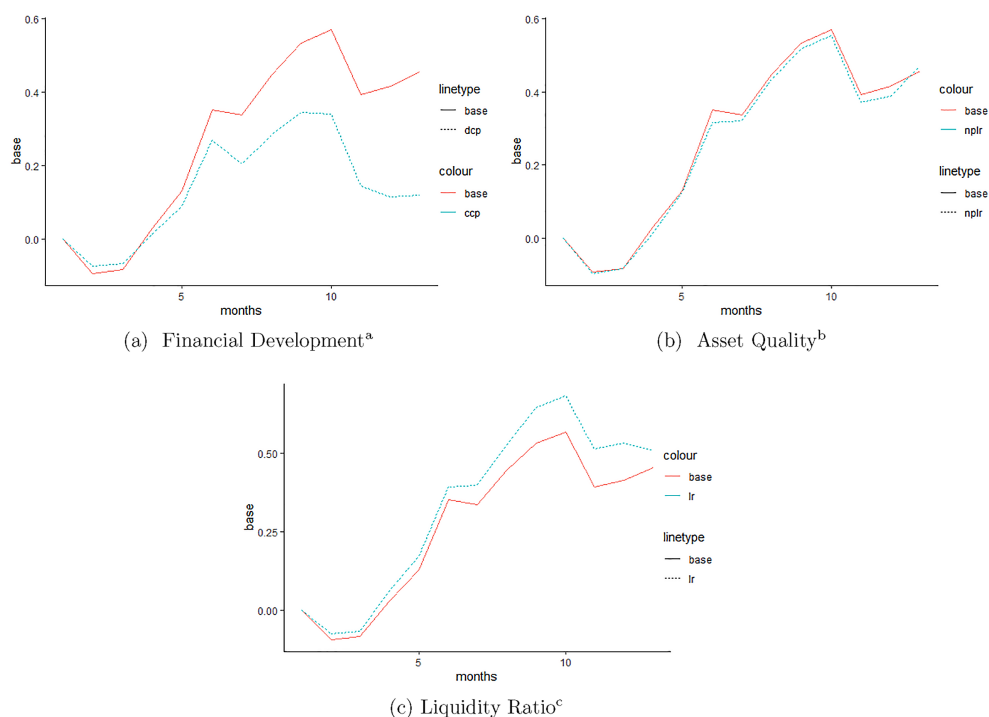
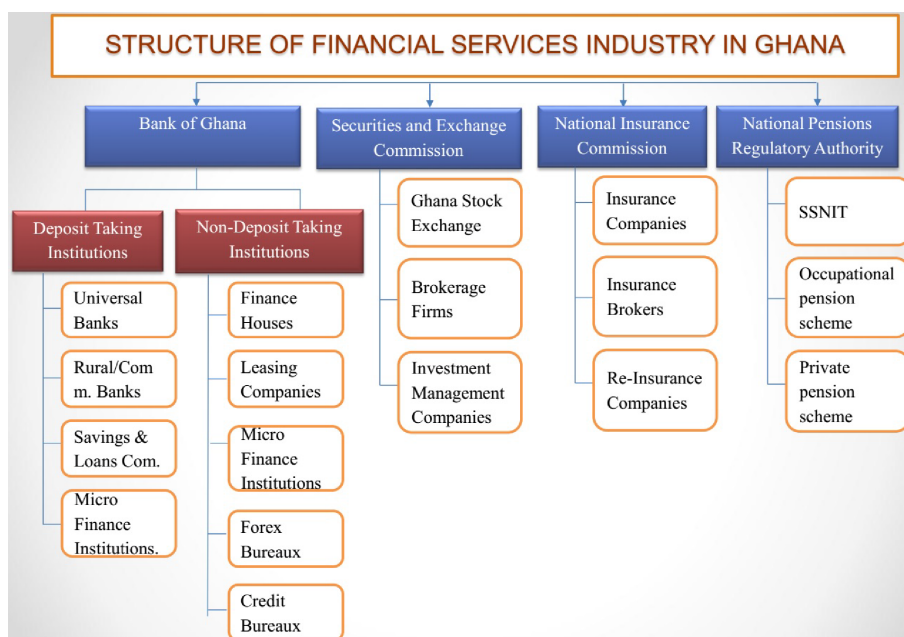


FIGURE 7 Structure of financial sector of Ghana. Source: Bank of Ghana ((BoG) website [Colour figure can be viewed at wileyonlinelibrary.com]



expected to explore the negative policy change to their advantage.

The evidence from the result is, however, not surprising because, the exploratory analysis in Table 5 showed that while there exist a significant correlation between interest rate and positive policy change, there is no significant correlation between interest rate and negative policy rate change. The reason could be the profits of formal banks depend mainly on interest income.⁸ As a result, banks easily increase the retail rate when policy rate increases but are reluctant to decrease them in order not to cut down on interest income. Also, the counter phenomenon might be due to low competition and inefficient in the formal sector which prevents banks to take advantage of policy rate fall.

5.3.2 | Other determinants

We investigated the effect of other economic variables on the pass-through. Following theory, we explored the effect of financial development, asset quality, and liquidity ratio on the pass-through estimate. Figure 6a, b, c shows the IRF generated for the model contrasting variations with indicators for financial development, asset quality, and liquidity respectively. While we observed that financial development and liquidity ratio have significant adverse effect on the pass-through, we did not observe any significant effect for asset quality.

6 | CONCLUSION AND POLICY RECOMMENDATION

In conclusion, the study found weak pass-through for Ghana. Estimated average pass-through is approximately 50%, which is comparable to developing economies with similar characteristics like Ghana. The weak pass-through shows that monetary policy is very weak in Ghana. This indicates that The BoG have limited control on interest rates. The weak pass-through is further dampened by factors such as excess liquidity ratio and non-performing loans as the study identified them to adversely influence transmission process. Informal banking is found to adversely affect monetary transmission, however with minimal impact. Though, the impact of informal banking on monetary transmission is small, the possibility of the effect exacerbating cannot be underestimated given that the size of the informal financial market keeps increasing.

The findings of the study have a number of policy implication for the conduct of monetary policy in developing economies, particularly Ghana. Generally, the weak pass-through cast doubt on the effectiveness of the hitherto approach of

implementing monetary policy in Ghana. The effectiveness of the traditional framework relies on the ability of the central bank to influence the intermediate target (i.e., interest rates). The inability to control interest rates limit the ability to influence the real economy. This, thus warrants a new approach that can circumvent the intermediate target. To achieve this, the central bank can adopt some unconventional approaches that bypass the intermediate targets.

Also, the findings of the study beget some revelations that require further interrogation. The asymmetry results suggest that the effect of informal intermediation on pass-through change for policy rate fall is very low compared to that of a policy rate rise. This counter phenomenon might be due to low efficiency in the financial sector or possible behavioural characteristics of the banks that support it. This requires an interrogation into the financial structure of Ghana amidst the development of informal credit activities to produce a policy framework that will ensure monetary effectiveness.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study were obtained from two different sources: the world-bank database openly available at <http://datatopics.worldbank.org/world-development-indicators/>, and data from the Bank of Ghana resources, which are available upon request.

ORCID

Richard Kwabi Ayisi  <https://orcid.org/0000-0001-7437-6412>

ENDNOTES

¹ The term formal is used to capture universal banks that are required by law to keep reserves with the central bank. On the other hand, informal credit is used in this study to refer to banking activities that take place outside universal banking, and are not directly amenable to the required reserve regulation of the central bank. In Ghana, encompassed in this definition are the Non-Bank Financial Institutions (NBFIs), Rural and Community Banks (RCB), rotating savings and credit associations (ROSCAs), micro-finance institutions, among others.

² Susu means savings collection and is a system that offers products to help clients accumulate their own savings over periods ranging from a month to 2 years. Susu is collected in the form of clubs or cooperative scheme. The clubs are smaller units engaging in funds mobilization. The cooperative susu collectors, through regulations have incorporated susu methodology into formal financial institution. The co-operative association was formed and registered under co-operative societies degree, 1968 (NLCD 252) with the name Ghana Cooperative Susu Collectors Association (GCSCA)

³ Saborowski and Weber (2013) interpolated lower frequency data for similar analysis. Also, the World Development Indicator (WDI) data by the World Bank is often interpolated to fill the data

gap for countries whose data are not available at the required frequency. The interpolation were conducted gauging against any distortion that will affect the time series properties of the data.

- ⁴ We used the partial sum process to decompose the policy rate MPR_t into positive and negative changes as

$$MPR_t^+ = \sum_{j=1}^t \Delta MPR_j^+ = \sum_{j=1}^t \text{Max}(\Delta MPR_j, 0)$$

$$MPR_t^- = \sum_{j=1}^t \Delta MPR_j^- = \sum_{j=1}^t \text{Min}(\Delta MPR_j, 0)$$

- ⁵ The optimal lag length of four was chosen based on the Akaike and Schwarz information criteria

- ⁶ See for example; Wu, Luca, and Jeon (2007), Chandan (2005) for Mauritius, and Samba and Yan (2009) for Central Africa Economic and Monetary Community. Mishra and Montiel (2013) use a sample of 94 countries and find that the correlation between policy rates and lending rates in the long term is 0.35 for advanced economies, 0.61 for emerging economies and 0.29 for LDCs.

- ⁷ The unrestricted model is the estimated model with all the potential determinant in set X_t , while the fully-restricted model is the model with only the endogenous variables.

- ⁸ See various issues of BoG financial stability reports

REFERENCES

- African development report, A. (1994). African development report.
- Aryeetey, E. (1994). *Financial integration and development in sub-saharan africa: A study of informal finance in Ghana*, England: Overseas Development Institute.
- Board, I. F. S. (2014). Global shadow banking monitoring report 2014, 30 october.
- Chandan, J. K. (2005). Nonlinearities in the adjustments of commercial banks' retail rates to interbank rates: The case of Mauritius. *The IUP Journal of Financial Economics*, 3(3), 37–53.
- Chipeta, C. (1998). *Improving the intermediation role of the informal financial sector in Africa*, Asia: United Nations Asia.
- Chipeta, C., & Mkandawire, M. L. C. (1991). *Informal financial sector and macroeconomic adjustment in Malawi*. Nairobi: Africa Economic Research Consortium (AERC); 4.
- Friedman, M., & Schwartz, A. (1963). *A monetary history of the United States*. Princeton, NJ: Princeton University Press.
- Jordà, Ò. (2005). Estimation and inference of impulse responses by local projections. *American Economic Review*, 95(1), 161–182.
- Mishra, P., & Montiel, P. (2013). How effective is monetary transmission in low-income countries? A survey of the empirical evidence. *Economic Systems*, 37(2), 187–216.
- Montiel, M. P., Spilimbergo, M. A., & Mishra, P. (2010). *Monetary transmission in low income countries (No. 10-223)*. Washington, DC: International Monetary Fund.
- Ngalawa, H., & Vieg, N. (2013). Interaction of formal and informal financial markets in quasi-emerging market economies. *Economic Modelling*, 31, 614–624.
- Rahman, A. (1992). The informal financial sector in Bangladesh: An appraisal of its role in development. *Development and Change*, 23(1), 147–168.
- Rahman, A. (1994). The informal financial sector in Bangladesh: An appraisal of its role in development—A reply. *Development and Change*, 25(3), 641–643.
- Saborowski, C., & Weber, M. S. (2013). *Assessing the determinants of interest rate transmission through conditional impulse response functions (No. 13–23)*, Washington, DC: International Monetary Fund.
- Samba, M. C., & Yan, Y. (2009). Interest rate pass-through in the central african economic and monetary community (caemc) area: Evidence from an adrl analysis. *International Journal of Business and Management*, 5(1), 31.
- Soyibo, A. (1997). The informal financial sector in Nigeria: Characteristics and relationship with the formal sector. *Development Policy Review*, 15(1), 5–22.
- Wu, J., Luca, A., & Jeon, B. (2007). Transmission of monetary policy via domestic and foreign banks in emerging economies: Evidence from bank-level data. *Journal of International Money and Finance*, 30(6), 1128–1156.

How to cite this article: Ayisi RK. Does informal banking influence monetary policy transmission? Some empirical evidence for Ghana. *Int J Fin Econ*. 2022;27:2345–2355. <https://doi.org/10.1002/ijfe.2276>