UNIVERSITY OF CAPE COAST

EFFECTIVENESS OF MONETARY POLICY IN WEST AFRICA

MONETARY ZONE

BY

CHRISTOPHER QUAIDOO

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DECLARATION

Candidates Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature ………………………… Date ………………………

Name: Christopher Quaidoo

Supervisors' Declaration

We hereby declare that the preparation and presentation of this thesis were supervised in accordance with the guidelines on the supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature……………… Date ………………………

Name: Prof. Vijay Bhasin

Co-Supervisor's Signature…………………… Date ………………………

Name: Dr. William Gabriel Brafu-Insaidoo

ABSTRACT

One of the important primary macroeconomic convergence criteria of the West African Monetary Zone (WAMZ) is the attainment of single-digit inflation. Available data show that but for The Gambia, none of the member states has achieved this objective on sustained basis. This raises concerns about the effectiveness of monetary policy transmission mechanism in controlling inflation in the Zone. This thesis addressed three policy relevant issues: (1) investigated the effectiveness of monetary policy transmission mechanisms, (2) explored the opinions of experts on the conduct of monetary policy in Ghana, and (3) assessed the role of fiscal dominance in constraining the conduct of monetary policy. The thesis employed the mixed method. The results showed that the channels of monetary policy transmission differ across the WAMZ member states. While the interest rate channel remains ineffective for the various WAMZ countries, the bank lending channel was only effective in Ghana and The Gambia. Also, the results of the study found evidence of exchange rate channel in Nigeria. On the other hand, the qualitative study on Ghana revealed that the independent status of the CB has enhanced the conduct of monetary policy in achieving price stability. Finally, the results showed that fiscal dominance complements the inflationary effect of money supply. The study recommended that various CBs in the WAMZ countries should deepen their financial markets in order to boost financial intermediation with the view to improving monetary policy transmission in achieving price stability in the Zone.

KEYWORDS

Central Bank Independence

Structural Vector Autoregression

Inflation Targeting

Monetary Transmission Mechanism

West African Monetary Zone

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DEDICATION

To my wife, Irene Quaidoo and daughter, Esi Kwegyirba Quaidoo

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LIST OF ABBREVIATIONS AND ACRONYMS

ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
ARLD	Autoregressive Distributed Lag
BoG	Bank of Ghana
BRICS	Brazil, Russia, India, China, and South Africa
BSL	Bank of Sierra Leone
BVAR	Bayesian Vector Autoregression
CB	Central Bank
CBG	Central Bank of The Gambia
CBI	Central Bank Independence
CPS	Credit to private sector
CWN	Cukierman, Webb and Neyapti
DMBs	Deposit Money Banks
DOLS	Dynamic OLS
EAMU	East Africa Monetary Zone
ECOWAS	Economic Community of West African States
EMCP	ECOWAS Monetary Cooperation Programme
EMT	Economic Management Team
FEVD	Forecast Error Variance Decomposition
FINSAP	Financial Sector Adjustment Programme
FMOLS	Fully Modified OLS
FPE	Final Prediction Error
FTPL	Fiscal Theory of the Price Level
GDP	Gross Domestic Product

GMT	Grilli, Masciandaro and Tabellini
GMM	Genearlised Methods of Moments
HQ	Hannan-Quinn
IMF	International Monetary Fund
IPS	Im-Pesaran-Shin
IRFs	Impulse Response Functions
IT	Inflation Targeting
LR	Lending Rate
MoF	Ministry of Finance
MPC	Monetary Policy Committee
MPR	Monetary Policy Rate
MW	Maddala and Wu
NER	Nominal Exchange rate
NKM	New Keynesian Model
NKPC	New Keynesian Phillips curve
OECD	Organisation of Economic Cooperation Development
OLS	Ordinary Least Square
OMO	Open Market Operations
PP	Philips-Perron
PPP	Purchasing Power Parity
SSA	Sub-Saharan African
SVAR	Structural Vector Autoregression
SVECM	Structural Vector Error Correction Model
TOR	Turnover Rate
VAR	Vector Autoregression

VEC	Vector Error Correction
VECM	Vector Error Correction Model
WAEMU	West African Economic and Monetary Union
WAMA	West African Monetary Agency
WAMI	West African Monetary Institute
WAMZ	West Africa Monetary Zone

CHAPTER ONE

INTRODUCTION

Since the launch of the West African Monetary Zone (WAMZ) in December 2000, none of the member states has achieved the single digit inflation criterion on a sustained basis apart from The Gambia. Between the period of 2001 and 2014, Sierra Leone recorded an inflation rate of 10.9 per cent while Nigeria, Ghana and Guinea registered inflation rates of 12.7, 14.1 and 17.1 per cent, respectively. Which factor(s) could be accounting for the difficulty of the WAMZ member states in achieving the single digit inflation criterion? Could it be that the single digit inflation target is not feasible, or is it due to the ineffectiveness of monetary policy in influencing price level and real output in the WAMZ? This thesis therefore aims to investigate the effectiveness of monetary policy in the WAMZ member states. This would help to ascertain whether the challenge is due to monetary policy ineffectiveness or otherwise.

Background to the Study

The desire to create a common monetary union and introduce a single currency to promote economic growth and development in the West African sub-region has been on the drawing board of Economic Community of West African States (ECOWAS) since its establishment in 1975. It was expected that the introduction of a single currency in the sub-region would among others boost intra-regional trade, reduce transaction costs, eliminate exchange rate risks and promote investment. On the global front, ECOWAS as a sub-regional trade bloc, can be considered as a stepping stone to negotiate for better multilateral trade agreement.

To expedite the ECOWAS economic and monetary integration programme, the Heads of States and Governments adopted ECOWAS Monetary Cooperation Programme (EMCP) in 1987 with the long-term goal to establish ECOWAS monetary union and a common central bank (CB) to issue a common currency (Bentum-Ennim, 2014). The member states were required to comply with a set of macroeconomic convergence criteria (including inflation rate of 5 per cent or less and budget deficit/GDP ratio excluding grants of 4 per cent or less) meant to create a stable macroeconomic environment for the establishment of a single monetary zone (Fwangkwal, 2014). However, due to certain obstacles such as lack of commitment, political will and, policy coordination and harmonisation between the West African Economic and Monetary Union (WAEMU) and non-WAEMU countries that confronted the ECOWAS, the long-term goal of the EMCP was not achieved (Ashinze, 2003).

Consequently, the ECOWAS in December 1999 at its 22nd Summit held in Lome, Togo adopted two "fast-track" approaches with the view to reviving and accelerating the monetary integration process in the sub-region. The first "fast-track" approach involved the establishment of a second monetary union by the Anglophone West African countries. The second "fast-track" approach on the other hand envisaged the ultimate merging of WAMZ and WAEMU to form a common monetary zone to issue a single ECOWAS currency, the Eco, in 2004 (Ashinze, 2003; Fwangkwal, 2014).

Furthermore, the Heads of States and Governments of five ECOWAS countries comprising Nigeria, Ghana, The Gambia, Sierra Leone and Guinea officially signed a treaty in December 2000 to form the WAMZ. They also

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committed themselves to meet four primary convergence criteria complemented with other six secondary criteria within a timeline as a prelude to the implementation of the WAMZ by 2003. These primary convergence criteria are: a single digit inflation rate; fiscal deficit/GDP of 4 per cent or less; CB lending to government of 10 per cent or less of the previous year's fiscal receipts, and foreign exchange reserves of 3 months or more of import cover. To achieve the objective of the WAMZ, the West African Monetary Institute (WAMI) was also established in January 2001 to undertake all the technical preparatory works for the creation of a common CB and introduction of a single currency (Ashinze, 2003; Fwangkwal, 2014).

However, none of the member countries has achieved all the four primary convergence criteria on a sustained basis since the launch of the WAMZ in 2000 (Fwangkwal, 2014; Harvey & Cushing, 2014). Generally, the WAMZ member states have had difficulties in achieving the single digit inflation and fiscal deficit to GDP targets. The non-compliance to the single digit inflation benchmark has been attributed to two reasons. First, internal country-specific economic difficulties, such as excessive deficits financing, and overdependence on imported commodities. Second, external shocks such as commodity price shocks and terms of trade shocks. These shocks put pressure on domestic currencies to generate inflationary pressures in the member states (Ahortor, Adenekan & Ohemeng, 2012; Itsede, 2003).

To comply with the single digit inflation target, the CBs of WAMZ member states have made the pursuit of price stability as the ultimate objective of monetary policy without losing focus on economic growth (Itsede, 2003; Tarawalie, Sissoho, Conte & Ahortor, 2013). Monetary policy

involves the use of various policy instruments or measures by the monetary authorities to influence the supply of money, availability and cost of credit in achieving certain macroeconomic goals of an economy. The main objectives or goals of monetary policy include price stability, financial stability, sustainable economic growth, exchange rate stability, creation of employment and maintenance of balance of payments equilibrium (Quartey & Afful-Mensah, 2014). CBs use various monetary policy tools or instruments such as rediscount rate, open market operations and reserve requirements to influence macroeconomic variables in order to achieve their targets or goals.

Moreover, as part of the broad financial reforms in the WAMZ states, the various CBs were granted operational independence which allows them to deploy monetary policy instruments to achieve price stability and stimulate economic growth. Nonetheless, a study by the International Monetary Fund (IMF) (2010) in Sub-Saharan Africa including WAMZ member states, identified the following reasons as the major constraints to the effectiveness of monetary policy in stabilising prices and output: high level of excess reserves in the financial system, underdeveloped financial markets, poor institutional quality and fiscal dominance.

The effectiveness of monetary policy is tied to the ability of the policy instruments used by the monetary authorities to significantly affect price level, real output and other macroeconomic variables in an economy. The effectiveness of monetary policy is dependent on how changes in monetary policy instruments are transmitted to the targets. The process through which changes in monetary policy instrument (either monetary aggregate or short-term interest rate) affect the ultimate goals such as price level and real output

is referred to as monetary transmission mechanism. Monetary policy transmission mechanism works through various channels including interest rate, credit, exchange rate and asset price (Bernanke & Gertler, 1995; Loazya & Schmidt-Hebbel, 2002; Mishkin, 1995).

Given that CBs in the WAMZ operate different monetary frameworks (monetary and inflation targeting as well as exchange rate targeting for Liberia), successful implementation of the WAMZ to some extent would depend on effective harmonisation of existing monetary policies across member countries to arrive at a common monetary policy framework. This would require a clear understanding of the monetary transmission mechanism since any potential significant heterogeneity in the transmission mechanisms of monetary policies across the participating countries would hamper harmonisation of monetary policies and design of appropriate common monetary policy for implementation by the union (Davoodi, Dixi & Pinter, 2013; Ehrmann, 2000).

Moreover, it has been documented that the degree of CB independence improves the conduct of monetary policy in achieving a lower, stable inflation. It is believed that CBs that are shielded from direct political interference have a stronger mandate to pursue price stability and reduce inflation bias (Jacome & Vazquez, 2008; Kydland & Prescott, 1977; Mishra, Montiel & Spilimbergo, 2012; Rogoff, 1985; Walsh, 1995). The implication is that the operational independence granted the various CBs in the WAMZ should enhance the conduct of monetary policy in achieving price stability in the member countries.

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Furthermore, the effectives of monetary policy and channels of monetary transmission of the WAMZ member states is also influenced by the fiscal dominance emanating from substantial monetary financing of fiscal deficits (IMF, 2010; Itsede, 2003). The upsurge in fiscal deficits tends to increase the stock of government debt, both domestic and external, which affects the conduct of monetary policy in achieving price stability (Bildirici & Ersin, 2007). Hence, there is the need for strong policy coordination between the monetary and fiscal authorities in the management of various WAMZ economies to achieve price stability and sustainable economic growth.

Unlike the advanced economies, not much studies have been conducted to investigate the effectiveness of monetary policy in the presence of fiscal dominance in the WAMZ. Some of the previous studies on monetary transmission in the WAMZ focused on the pass-through of monetary policy changes to lending rates without exploring the channels through which monetary policy shocks are transmitted to prices and real output (Kovanen, 2011; Sakyi, Mensah & Obeng, 2017). Other studies that investigated the channels of transmission used few observations compared with the number of variables for empirical analyses, which raise questions about the degrees of freedom and reliability of the results (Abradu-Otoo, Amoah & Bawumia, 2003; Adenekan & Ahortor, 2013; Ogun & Akinlo, 2010). In addition to the above-mentioned gaps in the literature, a qualitative assessment of experts' opinion on the conduct of monetary policy within the WAMZ is absent.

Motivated by the above, this thesis adopted mixed method to analyse the effectiveness of monetary policies in the WAMZ. Specifically, this study using quantitative approach sought to investigate the effectiveness of

monetary policy with emphasis on the channels of monetary policy transmission in the presence of fiscal dominance in the WAMZ countries. In addition, the study adopted a qualitative approach to investigate the operational independence of the CB in achieving price stability by exploring the perceptions of experts on the conduct of monetary policy in the WAMZ with emphasis on Ghana. The choice of Ghana as a case study is conditioned on the fact that it is the only country operating inflation targeting framework, which would be adopted by the future CB of the WAMZ, West African Central Bank (Itsede, 2003).

Statement of the Problem

The establishment of a common monetary union and introduction of a single currency for the sub-region has been the long-term goal of the ECOWAS and the WAMZ member states. One of the key requirements for the creation of a common monetary union and use of a single currency by the WAMZ member states is the attainment of price stability fostered by effective monetary policies of all member countries. However, the achievement of this goal has eluded the member states and has partly contributed to the postponement of introduction of the common currency since 2003 for four conservative times.

The difficulty in achieving the single digit target raises several questions on the effectiveness of country-specific monetary policies, country-specific economic conditions such as excessive deficits financing (Ahortor *et al.*, 2012; Itsede, 2003), and the independence of CBs in the member states. While the above issues may prove crucial in the attainment of single digit inflation within the WAMZ, the roles of monetary policy effectiveness,

economic conditions such as fiscal dominance, and CB independency remain an under researched area especially within the WAMZ. More specifically, the effectiveness of monetary policy may be conditioned on the degree of independence and fiscal state of the economy (IMF, 2010; Itsede, 2003). For example, in the case, where excessive fiscal deficit financing is channelled into consumption expenditure instead of investment, inflation may result. This may inhibit the effectiveness of monetary policy in controlling price levels.

Furthermore, it has been argued that the degree of CB (operational) independence will enhance the conduct of monetary policy effectiveness in achieving price stability (Jacome & Vazquez, 2008; Mishra *et al.,* 2012; Rogoff, 1985; Walsh, 1995). The implication is that CBs that are shielded from direct political interference have a stronger mandate to pursue price stability and reduce inflation bias. As to whether this is the case for the WAMZ member states is an empirical question.

Following the above arguments, this thesis addressed the following questions:

1. What is the relative importance of the channels of monetary policy transmission mechanism in the WAMZ member states?

2. Does the operational independence of the CB improve the conduct of monetary policy in achieving price stability?

3. To what extent does the fiscal dominance compromise the conduct of monetary policy in achieving price stability?

Answers to these questions would enhance understanding of the effectiveness of monetary policy in transmitting monetary impulses to price level and real output in WAMZ countries.

Purpose of the Study

The main objective of the study was to investigate the effectiveness of monetary policy in the WAMZ. In specifics, the study sought to:

1. Investigate the effectiveness of channels of monetary policy transmission in influencing price level and real output;

2. Explore experts' perception on the conduct of monetary policy in Ghana.

3. To ascertain the extent to which domestic debt contributes to monetary policy ineffectiveness in influencing price level.

Research Hypotheses

The research hypotheses which guided the study are stated as follows:

1. H_0: The interest rate channel of monetary policy transmission is ineffective on price level and real output.

   H_1: The interest rate channel of monetary policy transmission is effective on price level and real output.

2. H_0: The exchange rate channel of monetary policy transmission is ineffective on price level and real output.

   H_1: The exchange rate channel of monetary policy transmission is effective on price level and real output.

3. H_0: The credit (bank lending) channel of monetary policy transmission is ineffective on price level and real output.

   H_1: The credit channel (bank lending) channel of monetary policy transmission is effective on price level and real output.

4. H_0: Domestic debt does not contribute to monetary policy ineffectiveness in influencing price level.

H$_1$: Domestic debt contributes to monetary policy ineffectiveness in influencing price level.

Research Questions

The qualitative study sought to address the following questions:

1. How has the operational independent status of the CB enhanced the conduct of monetary policy in Ghana?

2. What is the level of policy coordination between the monetary and fiscal authorities?

3. In what ways has the communication strategy of the CB enhanced transparency and accountability of monetary policy process in Ghana?

4. What are the factors causing weak monetary policy transmission mechanism in Ghana?

5. What are the major challenges facing inflation targeting framework in Ghana?

Significance of the Study

The consensus among economists is that monetary policy affects real economic activity in the short-run and inflation in the long-run. Mishkin (1995) argued that successful implementation of monetary policy requires an accurate assessment of the timing and effects of the monetary policy changes on the economy. This requires a clear understanding of the mechanisms and for that matter, the channels through which monetary policy actions affect real economic activity and inflation.

Results of the study will provide a better understanding of the real effects of monetary policy on inflation and real economic activity in the WAMZ member states. This, in turn, will provide better information that may

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help the various CBs within the WAMZ to formulate suitable monetary policies in influencing inflation and real output in their respective countries.

In addition, a good knowledge and a clear understanding of the degree of heterogeneity in transmission mechanisms across the WAMZ countries will provide valuable information to the various CBs in general and WAMI in particular. This valuable information may be useful to the WAMZ member states in the design and effective conduct of a common monetary policy framework for the union.

Although various country-specific studies have been conducted to investigate the effectiveness of monetary policy transmission mechanism in the WAMZ, such empirical studies have certain flaws that warrant further studies. Some of these country-specific studies focused on exploring the policy rate pass-through to retail market rates while others have issues with few degrees of freedom which affect the reliability of the results. The study improves upon the previous studies by employing structural vector autoregression (SVAR) model which performs better than the standard vector autoregression model, using monthly and quarterly data sets spanning 2001 to 2014. Moreover, none of the studies employed a qualitative approach in assessing experts' opinion on the conduct of monetary policy within the WAMZ. The study therefore provides more insight into the conduct of monetary policy in the WAMZ countries.

Furthermore, the findings from the qualitative study in assessing the performance of the Central Bank of Ghana in the conduct of monetary policy Ghana may be useful to the Bank of Ghana (BoG) in different ways. For instance, the findings may be useful to the BoG in designing appropriate

policies and programmes to improve the communication strategy, monetary transmission mechanism and minimise the high interest rate spread.

Finally, the study contributes to the literature on monetary transmission mechanism and the fiscal theory of the price level in the WAMZ which may be useful for future studies. The findings of the qualitative research will also serve as basis for further qualitative studies into the conduct monetary policy in other WAMZ member states.

CHAPTER TWO

OVERVIEW OF WAMZ ECONOMIES

Introduction

Chapter Two is devoted to an overview of five WAMZ economies considered for the study. The chapter begins with the overview of the evolution of the WAMZ and concludes with the overview of monetary policy frameworks operated by the various WAMZ countries. The chapter also highlights the economic structure of WAMZ and presents a trend analysis of the primary macroeconomic convergence criteria of WAMZ countries from 2001 to 2014.

Evolution of WAMZ

The consideration for the introduction of a monetary zone and a common currency in the sub-region has remained a central focus and a major point of deliberation among the member states of ECOWAS since the establishment of ECOWAS in 1975. Prior to the establishment of the ECOWAS in 1975, there were two monetary unions in West Africa administered by the colonial masters, British and France (Soyibo, 1998). Under the British colonial rule, Anglophone West African countries comprising Ghana, The Gambia, British Cameroon, Nigeria and Sierra Leone used a common currency, the British West African pound managed by the West African Currency Board.

However, Ghana and Nigeria, upon attaining independence established their respective CBs to issue local currencies to replace the British West African pound. The British West African pound eventually collapsed when the other members issued their own currencies. In contrast, the Francophone

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West African countries made up of Benin, Burkina Faso, Côte d'Ivoire, Mali, Niger, Senegal, and Togo continued to use a common currency, the CFA franc inherited from France after achieving their independence. The Francophone West African counties consequently established a monetary union, the West African Economic and Monetary Union in 1994 with a single CB, Banque Centrale des Etats de l'Afrique de l'Ouest and a common currency (CFA) which was fully convertible within the French franc zone (Harvey & Cushing, 2014; Soyibo,1998).

In line with globalisation and to expedite the ECOWAS economic and monetary integration programme, the Heads of States and Governments of ECOWAS adopted EMCP in 1987 with the specific objectives of improving and strengthening the sub-regional payments systems under the West African Clearing House (West African Monetary Agency) and introducing limited currency convertibility within the short to medium term. The long-term goal of EMCP was to establish ECOWAS monetary union and a common CB to issue a common currency (Bentum-Ennin, 2014).

To achieve these objectives, the ECOWAS member states were to comply with a set of primary and secondary macroeconomic convergence criteria (Fwangkwal, 2014). The primary macroeconomic convergence criteria under the EMCP comprise the following:

1. inflation rate of 5 per cent or less;

2. Budget deficit/GDP ratio (excluding grants) of 4 per cent or less;

3. CB financing of budget deficit of 10 per cent or less of the previous year's tax revenue and

4. Gross external reserves of at least 6 months of imports cover. On the other hand, the six secondary convergence criteria are outlined below:

1. Prohibition of new arrears and liquidation of all outstanding ones;

2. Tax receipts/GDP ratio of 20 per cent or more;

3. Salary mass/total tax receipts ratio of 35 per cent or less;

4. Public investments financed from internal resources/tax receipts ratio of 20 per cent or more;

5. Positive real interest rates; and

6. Real exchange rate stability.

However, due to certain challenges facing the sub-region as alluded to earlier, the EMPC could not achieve its long-term mandate as expected. As a result, the ECOWAS in December 1999 adopted a two-"fast-track" approach to introduce a common currency to be known as the Eco in the sub-region. The first "fast-track" approach involved the establishment of a second monetary union by the non-WAEMU countries by the year 2003. The second "fast-track" approach envisaged the ultimate merging of WAMZ and WAEMU to form a common monetary zone with a single ECOWAS currency in 2004 (Ashinze, 2003).

Consequently, the Heads of States and Governments of five ECOWAS countries comprising Nigeria, Ghana, the Gambia, Sierra Leone and Guinea officially signed a treaty in December 2000 to form the WAMZ. Liberia later joined the WAMZ in 2010. Similar to the EMCP, the WAMZ member states were required to comply with four primary and six secondary macroeconomic convergence criteria prior to the implementation of WAMZ by 2003. The primary convergence criteria comprise the following:

1. A single digit inflation rate;

2. Fiscal deficit/GDP of 4 per cent or less;

3. CB lending to government of 10 per cent or less of the previous year's fiscal receipts and

4. Foreign exchange reserves of 3 months or more of import cover.

The six secondary macroeconomic convergences are also outlined below:

1. Prohibition of new domestic arrears and liquidation of existing ones;

2. Tax revenue to GDP ratio equal to or greater than 20 per cent;

3. Wage bill (salary mass) to tax revenue ratio equal to or less than 35 per cent;

4. Public (domestic) investment to tax revenue equal to or greater than 20 per cent;

5. Maintain real exchange rate stability ($\pm$ 15 %) and

6. Positive real interest rate.

To achieve the objective of the WAMZ, the West African Monetary Institute (WAMI) was established in 2001 with headquarters in Accra, to coordinate and supervise the implementation of the WAMZ programme (Fwangkwal, 2014). Nonetheless, the WAMZ project has been postponed on four consecutive times due to non-compliance to all the primary convergence criteria by the member countries on sustained basis. This has cast doubts about the possibility of a successful introduction of a common currency in the WAMZ (Fwangkwal, 2014; Harvey & Cushing, 2014).

Economic Structure of WAMZ

The dominant economy in the WAMZ is Nigeria, with over 85.6 per cent of the zones' gross domestic product (GDP) (WAMI, undated). The second largest economy is Ghana which accounts for 14 per cent of the zones' overall output. Generally, the economy of WAMZ has been dominated by the service sector over the period under review. The real sector performance of individual countries is presented below.

Nigeria's Real Sector

The sectoral contribution to output and real GDP growth in Nigerian real sector is displayed in Figure 1. The real GDP growth experienced some slight fluctuations over the period. Nigeria recorded the highest growth of 9.58 in 2003 compared to the 3.59 per cent registered in 2008 due to the global financial crisis. The overall average growth of 5.8 per cent over the period as compared to the WAMZ's average growth rate of 5.8 per cent shows

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Service	25.4	20.9	20.5	23.7	23.7	26.1	26.6	25.7	28.7	54.1	52.9	54.3	57	60.4
Industry	40.9	30.5	36.8	42.1	43.5	41.9	40.7	41.5	34.2	22	24.8	23.7	21.9	18.4
Agric	33.8	48.6	42.7	34.2	32.8	31.9	32.7	32.9	37.1	23.9	22.3	22.1	20.9	21.2
Growth Rate	4.4	4.62	9.58	6.57	6.51	6.03	6.44	5.98	7	3.59	5.3	4.2	5.48	6.22
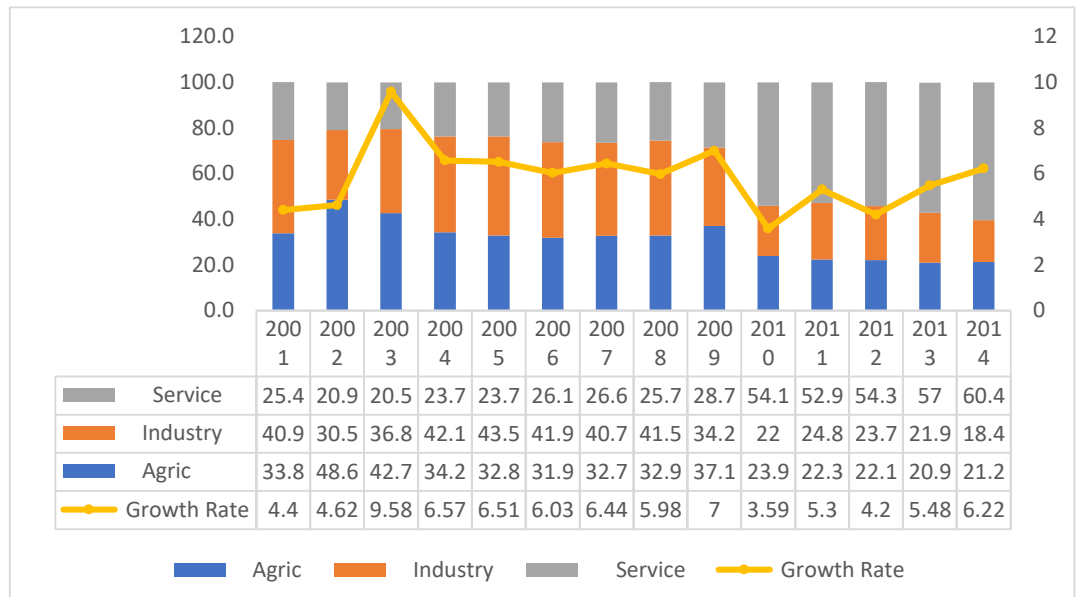
Figure 1: Nigeria - Trends in Sectoral Contribution to GDP and Real GDP Growth
 Source: Author (2018).

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that the Nigerian economy performed fairly well. Over the 14-year period, the service sector contributed 35.7 per cent to GDP compared to 33.1 per cent and 31.2 per cent by the industrial sector and the agriculture sector, respectively.

This compares favourably to the zone's respective sectoral average growth of 33.5 per cent, 23.6 per cent and 42.8 per cent by the agriculture sector, industrial sector and service sector. In all, Figure 1 shows that there has been a significant shift in the sectoral contribution to GDP from the agricultural sector to the service sector.

Ghana's Real Sector

The performance of the Ghanaian economy over the study period is shown in Figure 2. Like Nigeria, Ghana witnessed a significant shift in the sectoral contribution to GDP from the agricultural sector to the service sector. Ghana experienced steady growth in real GDP between 2001 and 2008 as real GDP growth increased from 4.2 to 7.3 per cent averaging 5.65 per cent. The real GDP, however, fell sharply to 4.2 per cent in 2009 due mainly to the

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Service	32.5	32.6	32	31.4	31.6	48.8	50.2	48.6	49.2	51.1	49.1	48.4	49.6	51.4
Industry	28.1	28.2	27.8	27.1	27.5	20.8	20.7	20.4	18.9	19.1	25.6	28.6	28.5	27.6
Agric	39.3	39.2	40.2	41.5	40.9	30.4	29.1	30.9	31.8	29.8	25.3	22.9	21.9	21
Growth Rate	4.2	4.5	5.2	5.6	5.9	6.2	6.3	7.3	4	7.7	14.1	8.8	7.6	4
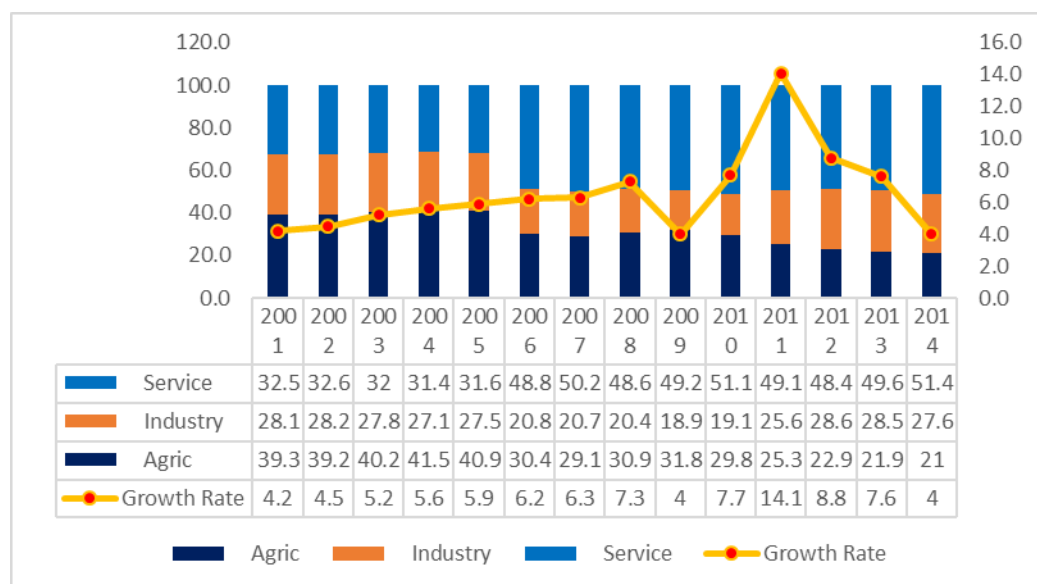
Figure 2: Ghana - Trend in Sectoral Contribution to GDP and Real GDP Growth
Source: Author (2018).

aftermath of global economic meltdown but registered the highest growth rate of 14.1 per cent in 2011 before tumbling to 4.0 per cent in 2014. The increase in real GDP growth rate in 2011 is attributed mainly to the addition of crude oil to the county's total output while supply side constraints adversely affected economic activity resulting in a sharp fall in the real GDP growth rate registered in 2014. The country's average growth of 6.5 per cent over the period as compared to the WAMZ's average growth rate of 5.8 per cent shows that the Ghanaian economy has performed better.

Over the 14-year period, the service sector contributed 43.3per cent to GDP compared to 24.9 per cent and 31.7 per cent by the industrial sector and agricultural sector, respectively. This compares to the WAMZ's respective average sectoral growth of 33.5per cent, 23.6 per cent and 42.8 per cent by the agriculture sector, industrial sector and service sector.

Guinea's Real Sector

Guinea, on the other hand, experienced significant fluctuations in real output growth from 2001 to 2014. Guinea registered its highest growth rate of 5.1 per cent in 2002 and a negative growth rate of 0.2 per cent in 2009 due

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Service	42.8	42.7	43.6	42.2	41.1	36.3	35.1	32.7	33.8	33.2	33.1	37.7	42.1	50.3
Industry	33.9	33.9	34.1	32.8	34.8	39.9	39.5	42.4	40.3	44.8	44.8	41.7	37.7	32.4
Agric	23.2	23.4	22.3	25.1	24.2	23.8	25.3	24.9	25.8	22	22.1	20.5	20.2	17.3
Growth Rate	3.6	5.1	1.2	2.3	3	2.5	1.8	4.9	-0.2	1.9	3.8	3.9	2.2	1
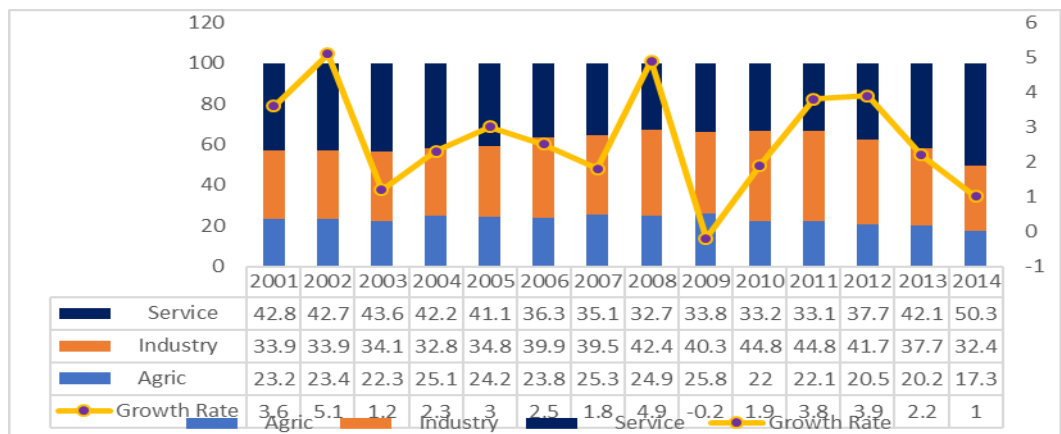
Figure 3: Guinea - Trends in Sectoral Contribution to GDP and Real GDP Growth
Source: Author (2018).

partly to the spillover effect of the global economic meltdown. The real GDP growth rate inched up significantly to 3.9 per cent in 2012 before declining to 1.0 per cent in 2014. The country's average growth of 2.6 per cent over the review period as compared to the WAMZ's 5.8 per cent shows that the Guinean economy performed abysmally.

In terms of sectoral distribution, the industrial sector contributed 38.1 per cent to GDP compared to 39.1 per cent and 22.9 per cent by the service sector and agricultural sector respectively. This compares to the WAMZ's respective average sectoral growth of 33.5 per cent, 23.6 per cent and 42.8 per cent by the agriculture sector, industrial sector and service sector. In sum, there has not been a significant change or shift in the sectoral contribution to GDP.

The Gambia's Real Sector

The Gambian economy experienced significant fluctuations in real GDP growth over the 14-year period. The real GDP growth rate ranges from a negative growth rate of 4.3 to a peak of 7.1 per cent in 2004. The negative real
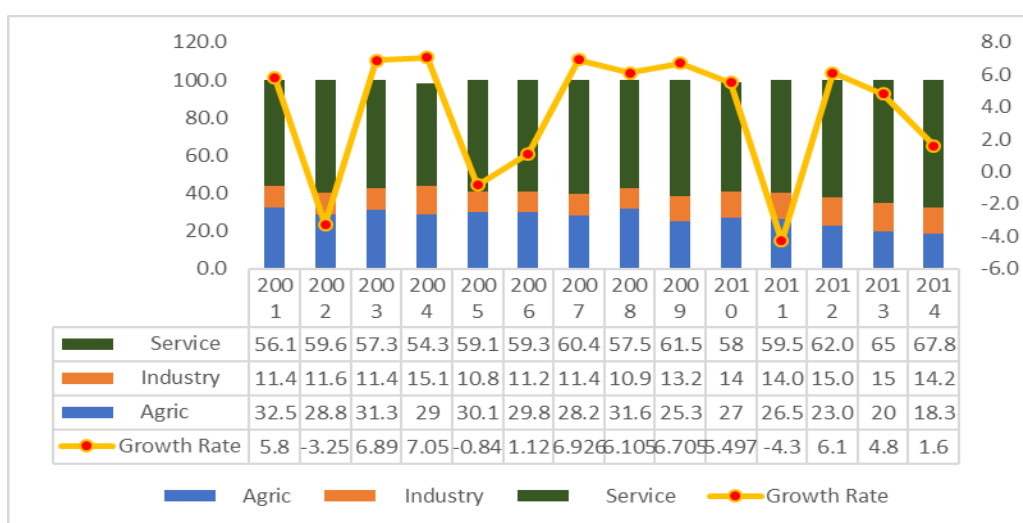
Figure 4: The Gambia - Trends in Sectoral Contribution to GDP and Real GDP Growth
Source: Author (2018).

GDP growth recorded is partly due to the adverse effects of the global economic crisis and largely to crop failure resulting from erratic rainfall. The real GDP picked up to 6.1 per cent in 2012 but could not be sustained in the subsequent years as it declined to 1.6 per cent. The Gambia's real GDP growth rate of 1.6 per cent recorded in 2014 represented a considerable deterioration from 4.8 per cent recorded in 2013 (WAMI, 2014). The slow real GDP growth recorded in 2013 and 2014 was due to the downturn in the agriculture and the service sector, particularly, tourism sub-sector. The overall average growth of rate of 3.6 per cent over the review period as compared to WAMZ's 5.8 per cent shows that The Gambian economy is struggling to spur growth.

In addition, over the review period, agricultural sector contributed 27.2 per cent to GDP compared to 59.8 per cent and 12.8 per cent by the service sector and the industrial sector respectively. This compares to the WAMZ's respective average sectoral growth of 33.5 per cent, 23.6 per cent and 42.8 per cent by agricultural sector, industrial sector and service sector. In sum, there has not been a momentous change or shift in the sectoral contribution to GDP.

Sierra Leone's Real Sector

The Sierra Leonean economy recorded a high economic growth between 2001 and 2003 peaking at 21.6 per cent in 2003. In contrast, the economy experienced a continuous decline in the GDP growth rate to 3.1 per cent, which coincided with the global economic meltdown in 2009. The real sector accelerated to a peak of 20.1 per cent driven by the development in mining, agriculture and services, but slumped to 7.1 per cent in 2014 due to the outbreak of the Ebola Virus Disease which disrupted economic activities

(WAMI, 2014). The country's average growth of 10.8 per cent over the 14-year period as compared to the WAMZ's 5.8 per cent shows that the Sierra Leonean economy performed better.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Service	42.7	40.9	39.3	35.6	35.6	36	35.1	35.4	34.9	35.7	34.9	34.6	32.6	34.9
Industry	8.5	9.5	11.1	12.6	11.9	11.1	10.1	8.2	6.9	8.2	7.9	8.6	7.9	4.6
Agric	48.7	49.6	49.6	51.8	52.5	52.9	54.8	56.3	58.2	56	57.1	56.7	59.5	60.5
Growth Rate	18.2	18.8	21.6	9.6	7.5	7.5	6.4	4.3	3.2	5.349	5.962	15.212	20.12	7.1
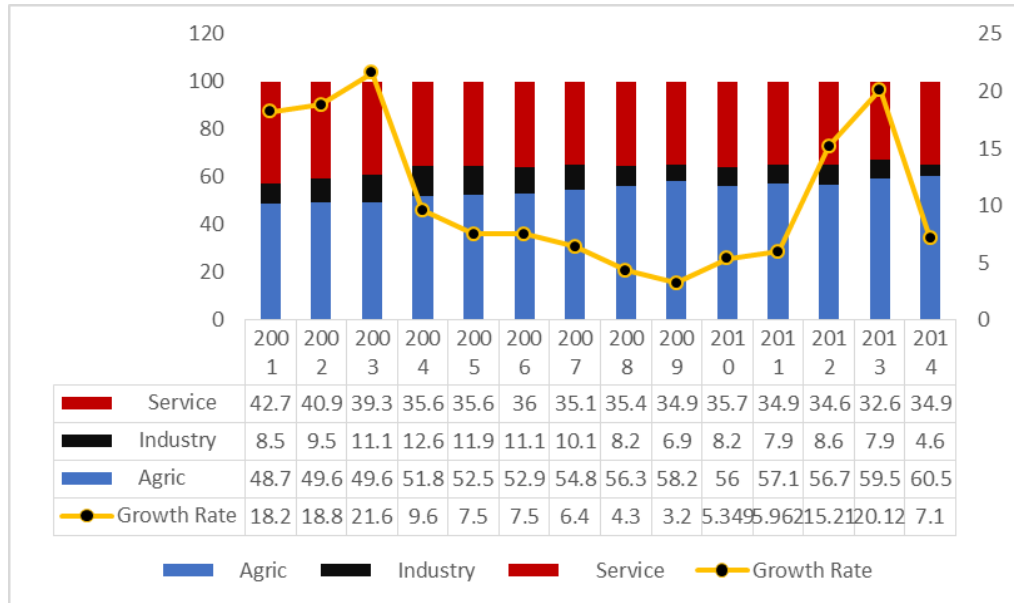
Figure 5: Trend in Sectoral Contribution to GDP and Real GDP growth in Sierra Leone
Source: Author (2018).

Over the same period, the agriculture sector contributed 54.6 per cent to GDP compared to 36.3 per cent and 9.1 per cent by the service sector and industrial sector respectively. This compares to the WAMZ's respective average sectoral growth of 33.5 per cent, 23.6 per cent and 42.8 per cent by the agriculture sector, industrial sector and service sector.

Macroeconomic Convergence Indicators (2001–2014)

Price stability (inflation)

The performance of WAMZ member states in relation to the first criterion of a single digit inflation is represented in the graph by the horizontal green line. The trend shows evidence of high inflation rates in the member states with the exception of The Gambia. Particularly, Guinea recorded a steady rise in the inflation rate of approximately 15 per cent in 2003 to 39 per

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cent in 2006. With the exception of The Gambia that has satisfied the criterion at least from 2004 to 2014, all the other member countries missed the inflation target for most part of the study period.
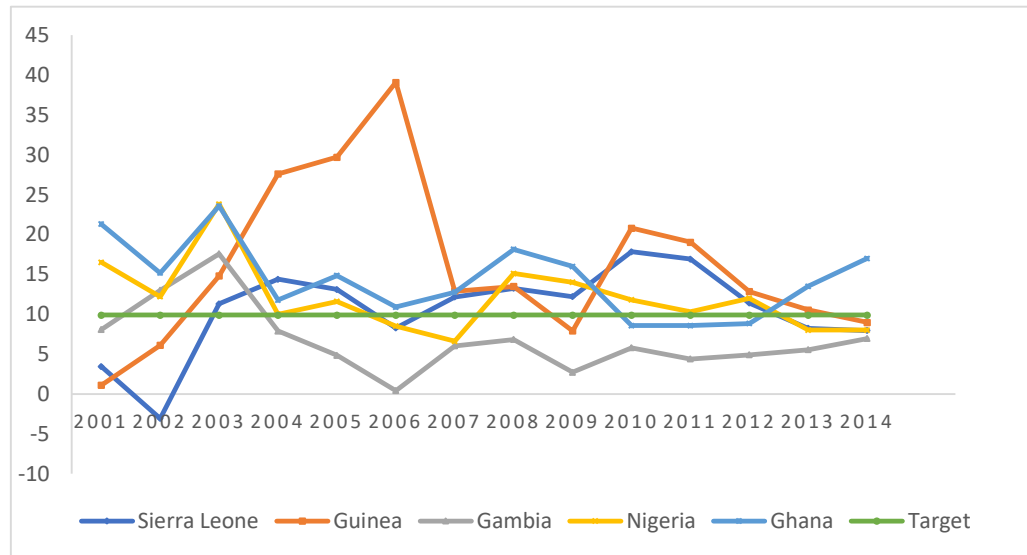
Figure 6: Trend of inflation in WAMZ Member States (2001–2014)
Source: Author (2018).

The statistical data demonstrates that, but for The Gambia, all the other member countries have recorded unstable oscillation of inflation rates from the 9.99 per cent to the 'red and blue lines' with inflation close to 20 per cent. Nonetheless, in the last four years, the trends of inflation rates among the member states except for Ghana moved closer to the 9.99 per cent.

Fiscal Deficit to GDP

Fiscal Deficit is one of the primary indicators of fiscal discipline or prudent management. As depicted in Appendix A, only Nigeria can boast of meeting the criterion satisfactorily as it has consistently spent within its budget over the study period. Though Guinea has in most part of the study period met the target, it missed the criterion in 2009 and 2010, a period that coincided with the heat of the Global Financial Crisis. Regrettably, Sierra Leone, Ghana and The Gambia have all performed poorly as they barely

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satisfy the criterion. Specifically, the best Sierra Leone has done over the 14-year period is the -5 per cent and -4 per cent deficits recorded in 2007 and 2013 respectively. Also, Ghana has shown evidence of fiscal indiscipline with its best performing years being 2005 and 2006 in which a deficit of 7 per cent in each year was recorded. Though The Gambia met the criterion in the period 2006 to 2008, it has been the worst performing member state at least for the last half of the study period.

Central Bank Financing of Fiscal Deficit

This convergence criterion requires that member states limit the financing of government deficits by their national CBs. This brings to the fore the need for various fiscal authorities to mobilize resources for financing deficits other than resorting to seigniorage or borrowing from the CBs. As per the data in Appendix A, except for 2003, Nigeria has satisfactorily met the criterion for the entire 14-year period. Though other member states have chalked some successes more effort is needed in order to meet the criterion.

External Reserves

This convergence rule is meant to secure the prices of national currencies through the foreign reserves the states hold individually. This criterion is pegged at three months of the imports value in each fiscal year. The best performing country is Nigeria as it has not failed to meet the rule in any of the 14-year period. Also, Ghana, Sierra Leone and The Gambia satisfied the criterion from 2004 to 2014, except in 2011 when Sierra Leone missed the target. This leaves Guinea as the only member state which is struggling to cope with the requirement. The data shows that Guinea has since 2004 failed to meet the rule.

Monetary Policy Frameworks of the WAMZ Countries

The monetary policy frameworks of the WAMZ member states under study have evolved from direct control monetary management to indirect market- based monetary policy framework since the independence. It is imperative to note that The Gambia, Guinea, Nigeria and Sierra Leone have monetary targeting as the framework for their monetary policy while Ghana operates inflation targeting regime. This section provides a brief overview of monetary policy frameworks of WAMZ member states from 1992 to 2015.

Conduct of Monetary Policy in Nigeria

The Central Bank of Nigeria (CBN) has operated different monetary policy frameworks over the years from the direct controlled monetary targeting to indirect monetary targeting framework as part of the financial sector reforms. The CBN adopted direct controlled monetary management between 1974 to 1992 with the main objective of promoting rapid and sustainable economic growth (Nnanna, 2001). During this period, the monetary authority administratively set the interest rates and directed credit allocation to prioritised sectors of the economy (Nnanna, 2001).

As part of the financial sector reforms, the CBN after 1992, adopted market-based monetary targeting framework using indirect monetary policy instruments with the base money and broad money as operational and intermediate targets. With The primary monetary instrument under the indirect market-based regime is Open Market Operations (OMO) which is complemented by other policy instruments such as the discount window operations, reserve requirements and minimum rediscount rate (MRR) used as indicative policy rate (Adenekan & Ahortor, 2013).

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The CBN was granted operational independence in 2007 by the CBN Act of 2007 with the pursuit of price stability as its ultimate objective in conducting monetary policy (Adenekan & Ahortor, 2013). The CBN replaced MRR with monetary policy rate as monetary policy instrument in December 2006 to signal monetary policy stance and anchor market interest rates as well as inflationary expectation. In addition, monetary policy committee (MPC) was constituted in 2007 to review economic performance and formulate policies that would ensure price and exchange rate stability. The current monetary policy practice of CBN, though considered as a monetary targeting, could be described as an implicit form of inflation targeting (Ononugbo, 2012).

Conduct of Monetary Policy in The Gambia

The Central Bank of The Gambia (CBG) adopted indirect monetary targeting policy framework after the financial reforms in 1986 with the objective of achieving price stability. It uses base money and broad money as the operating and intermediate targets. The monetary policy instruments used by the CBG include OMO, monetary policy rate and reserve requirements.

The CBG was granted operational independence in 2005 to conduct of monetary policy with price stability as the main objective of the Bank. Moreover, MPC was formed to oversee monetary policy formulation and implementation in order to achieve price stability including stability of the exchange rate (Tarawalie *et al.,* 2013). The CBG primarily uses OMO to manage liquidity in the banking system while monetary policy rate is used to signal the Bank's monetary policy stance and to serve as anchor for inflation expectation as well as all money market rates.

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Conduct of Monetary Policy in Sierra Leone

The ultimate policy objective of the Bank of Sierra Leone (BSL) is to achieve price stability. The BSL operated direct control monetary management prior to 1992. The BSL in 1992 adopted indirect market-based monetary targeting framework using OMO as the key monetary policy instrument complemented by reserve requirements (Ogunkola & Tarawalie, 2008; Tarawalie *et al.,* 2013).

The BSL uses monetary base as its operating target and broad money as its intermediate target. The BSL, in its quest to enhance the conduct of monetary policy, introduced monetary policy rate in February 2011 to signal the CB's monetary policy stance and anchor other money market rates as well as inflation expectation (BSL, 2011). Also, BSL established MPC to oversee monetary policy formulation and implementation in order to achieve price stability

Conduct of Monetary Policy in Guinea

The objective of monetary policy of the Central Bank of Guinea is price stability. Prior to 1993, the CB of Guinea implemented direct control monetary management. The CB of Guinea operates indirect market-based monetary targeting framework using reserve requirements, OMO and monetary policy rate as policy instruments. The Central Bank of Guinea has operational independence as enshrined in the Central Bank Act of 1995 (Tarawalie, *et al.*, 2013).

The CB of Guinea officially introduced monetary policy rate in 2010 to signal the Bank's monetary policy stance and to serve as anchor for inflation expectation as well as all market rates. The MPC has been formed to

formulate and implement monetary policy decisions of the CB of Guinea with the ultimate objective of achieving price stability.

Conduct of Monetary Policy in Ghana

The establishment of the BoG takes its roots to the Bank of the Gold Coast which laid the foundation for central banking in Ghana. The BoG was officially established on 4th March, 1957 by the BoG Ordinance (No. 34) of 1957, passed by the British Parliament. The BoG Ordinance (No. 34) of 1957 has since been amended severally over the years culminating in the passage of the Bank of Ghana Act 612 (2002). The CB's monetary policy objective is to ensure price stability–low inflation–without comprising the Government's economic objectives of promoting economic growth and employment. The BoG performs several functions including the formulation and implementation of monetary policy aimed at achieving the objects of the Bank as well as the regulation and supervision of the financial system to ensure smooth operation of the financial sector.

The CB of Ghana prior to 1992, operated direct controlled monetary management characterised by the use of direct intervention instruments such as interest rate controls, credit ceilings and directed lending including fixed exchange rate system (Abradu-Otoo *et al.,* 2003; Bawumia, 2010; Quartey & Afful-Mensah, 2014). The failure of the direct control monetary policy in achieving the desired macroeconomic objectives necessitated the adoption of market-based monetary regime in 1992 using indirect monetary policy instruments (Abradu-Otoo *et al.,* 2003; Bawumia, 2010). The shift to indirect market based monetary policy was introduced as part of the Financial Sector

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Adjustment Programme (FINSAP) that began in 1988 (Bawumia, Amoah & Mumuni, 2008).

The monetary targeting approach could not achieve desirable results as money supply and inflation targets were both missed (Kwakye, 2012) and characterised by persistent high inflation rate. Fiscal dominance and unstable money demand function due to continuous structural reforms and deregulation of the financial sector rendered monetary targeting framework ineffective in achieving the objective of price stability (Bawumia, 2010; Quartey & Afful-Mensah, 2014).

In 2002, a new bill, Bank of Ghana Act 612 (2002) was passed which granted operational independence to the CB and this culminated in the adoption of implicit inflation targeting monetary policy framework in 2002 (Bawumia, 2010). The Bank of Ghana Act 612 (2002) mandates the CB to maintain price stability as its ultimate objective. Monetary policy committee was also formed to formulate and implement monetary policy decisions. During the same period, the monetary policy rate was introduced as the main monetary policy instrument to signal the Bank's monetary policy stance and to anchor inflation expectation as well as money market rates. Ghana, in May 2007, officially became the second country in Sub-Saharan Africa to adopt inflation targeting framework after South Africa. Since the adoption of the inflation targeting framework, changes in inflation rate has been slower compared to the monetary targeting regime.

Conclusion

Chapter Two provided an overview of the WAMZ countries on the real sector, convergence criteria and monetary policy frameworks. The

overview shows that the service sector accounts for a greater contribution to the real output while real GDP on the average grew by 5.8 per cent for the five participating countries. Moreover, most of the countries missed fiscal deficit-to-GDP and single digit inflation criteria on several occasions. This is a challenge to successful implementation of the WAMZ.

CHAPTER THREE

LITERATURE REVIEW

Introduction

Theoretical and empirical literature which guided the study have been discussed in this chapter. The chapter is divided into two parts. Part one reviews theoretical literature on monetary policy transmission mechanism, conceptual issues relating to CB performance and theories on price level determination. Part two also discusses empirical studies relevant to the channels of monetary transmission, central bank independence (CBI) and effect of domestic debt on price level.

Theoretical Literature

Monetary Policy Transmission Mechanism

The effect of monetary policy in affecting real variables such as real output in an economy has long been debated in academic literature among the Classicals, Monetarists, Keynesians and the post-Keynesians. Recent literature has focused on the monetary policy transmission mechanism, the processes through which changes in monetary policy affect the ultimate objectives such as inflation and real output. This section, however, reviews relevant literature on stages of monetary policy transmission, factors that influence the effectiveness of monetary policy transmission mechanism, the choice of policy indicator and identification restrictions.

The monetary transmission mechanism operates through two main stages (Abradu-Otoo et al., 2003; Loayza & Schimdt-Hebbel, 2002). The first stage involves the transmission of changes in monetary policy instruments through the financial system or financial markets (money and asset markets)

affecting the lending rates, exchange rates, stock and bond prices. The second stage of monetary transmission mechanism involves the propagation of monetary impulses from the financial system to the real economy. This affects households and firms' spending decisions, and eventually prices and aggregate demand or output.

Channels of monetary transmission mechanism

The transmission mechanism according to Loazya and Schmidt-Hebbel (2002) works through various channels in affecting different macroeconomic variables and financial markets at different speed and different intensity. Five main channels of monetary transmission have been identified in the literature comprising interest rate channel, credit channel, exchange rate channel, assets channel and expectation channel (Loazya & Schmidt-Hebbel, 2002; Mishkin, 1995).

Interest rate channel

The interest rate channel has been the traditional channel of monetary policy transmission in the standard Keynesian IS-LM framework and the new Keynesian macroeconomic models (Clarida, Gali & Gertler, 2000). A contractionary monetary policy, either through an increase in policy rate or reduction in money supply, will lead to an increase in real interest rate due to price rigidities thereby increasing the cost of capital and a decline in investment spending including expenditure on consumer durable goods. This will result in a decrease in aggregate demand reflecting in a fall in output and prices (Mishkin, 1995). Taylor (1995) emphasised more on the interest rate channel of monetary transmission in an economy since it may have a

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significant impact on investment spending or decisions by both businesses and consumers.

The credit channel

Bernanke and Gertler (1995), on the other hand, stressed the important role of credit channel as an alternative channel of monetary transmission to the traditional interest rate channel due to information asymmetry which creates problems of moral hazards and adverse selection in financial markets. The credit channel is categorised into two: bank lending channel and balance sheet channel.

The bank lending channel works primarily through the supply of credit to firms; especially, the small firms where the problems of information asymmetry is high and also they cannot access credit through stock and bonds markets. A contractionary monetary policy reduces bank reserves and bank deposits, and consequently the amount of credit available to bank-dependent borrowers resulting in a fall in investment spending and a decrease in output. This implies that monetary policy will have a greater effect on expenditure by smaller firms, which are more dependent on bank loans compared to large firms, which can access credits through stock and bond markets.

In contrast, the balance sheet channel is linked to the role of collateral in reducing adverse selection and moral hazards. A contractionary monetary policy reduces equity prices (in the balance sheets) and net-worth of firms through their cash flows, the value of collateral and creditworthiness, thereby increasing the adverse selection and moral hazard problems. This reduces the level of loans available to the firms resulting in a decline investment and output.

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Exchange rate channel

The exchange rate channel of monetary policy transmission works through interest rate effects via uncovered interest rate parity. For instance, a decrease in real interest rate would make domestic currency deposits less attractive relative to foreign currency deposits. This would lead to a fall in demand for domestic currency and result in a depreciation of domestic currency. The depreciation of domestic currency is expected to make domestic goods cheaper compared to foreign goods and boost net exports and output (Mishkin, 1995; Obstfeld & Rogoff, 1995). On the other hand, monetary policy can influence the exchange rate through direct intervention in the foreign exchange market or inflationary expectations as noted by Dabla-Norris and Floerkemeier (2006). Changes in exchange rates also affect aggregate demand and the price level through their influence on the cost of imported goods, cost of production and investment.

Asset price channel

The asset price channel operates through the impact of monetary policy on asset prices and real wealth of firms and households. Mishkin (1995) identified two main mechanisms through which monetary policy shocks are transmitted to equity prices based on the Tobin's q and Modigliani's life-cycle model. Firstly, a contractionary monetary policy reduces equity prices which leads to lower q and a decline in investment spending. This reduces aggregate demand and output as well as prices. Secondly, a contractionary monetary policy resulting in a decrease in stock prices reduces households' wealth leading to a fall in consumption and aggregate demand. This will cause a fall in general price level.

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Expectation channel

Monetary policy actions may affect the economy through their impact on the expectations of economic agents about the future outlook of the economy (Dabla-Norris & Floerkemeier, 2006). For example, expectations about future changes in the policy rate can affect medium and long-term interest rates. Similarly, monetary policy actions can guide economic agents' expectations of future inflation and thus influence price developments (Davoodi *et al.*, 2013). Generally, expectation channel operates effectively in developed economies with well-functioning and deep financial markets.

Factors influencing monetary transmission mechanism

The effectiveness of monetary policy and the channels of monetary transmission are strongly influenced by the depth of financial structure and openness of the economy (Loaza & Scmidt-Hebbel, 2002; Mishra, Montiel, Pedroni & Spilimbergo, 2014) and the financial structure varies significantly across countries (Checetti, 1999). Loaza and Scmidt-Hebbel (2002) argued that a well-diversified financial system in terms of financial products and institutions facilitates timely propagation of changes in monetary policy to the money market interest rate. Moreover, the size of an economy and its openness to the external sector determine the importance of the exchange rate channel. The strength of the exchange rate channel depends on the type of exchange rate regime.

In the case of Sub-Saharan African countries, high level of excess liquidity in the financial system, underdeveloped financial markets, and substantial monetary financing of fiscal deficits (fiscal dominance) have been identified as the major constraints to monetary transmission mechanism (IMF,

2010). Mishra and Montriel (2013) also considered limited competition in the banking sector and a sharply rising marginal cost of lending as other factors limiting monetary transmission mechanism in the low-income countries.

Choice of monetary policy indicators

The effectiveness of monetary transmission mechanism is also dependent on the choice of appropriate monetary policy indicator for the empirical study (Mishra & Montiel, 2013). The policy indicators used for empirical study in monetary transmission mechanism include short-term interest rate, monetary aggregates or exchange rate depending partly on the type of monetary policy framework and how informative the monetary policy indicator is in affecting the aggregate demand. Walsh (2003) observed that how monetary policy is measured could significantly affect the outcome of the empirical results. The implication is that applying different monetary policy indicators to the same dataset would produce different empirical results.

Regarding the choice of appropriate indicator, Bernanke and Mihov (1998), Leeper, Sims and Zha (1996), and Bernanke and Blinder (1992) made a case for the choice of short-term interest rate as the appropriate policy indicator compared to monetary aggregates. This is because the growth rate of monetary aggregates is affected by other non-policy variables. In contrast, Bagliano and Favero (1998) preferred the long-term interest rate as the appropriate indicator of monetary policy. On the other hand, other authors such as Strongin and (1995), Christiano and Eichenbaum (1992) and Eichenbaum (1992) chose non-borrowed reserves as monetary policy indicator.

Identification restrictions of monetary policy shocks

There are two main strategies which are mostly used in analysing monetary policy transmission mechanisms. These are the recursive vector autoregression (VAR) and non-recursive VAR identifying restrictions or assumptions (Mishra & Montiel, 2013). The recursive VAR does not impose restrictions on the contemporaneous relationship among the endogenous variables although the ordering of the variables is motivated by economic theory. The endogenous variables are ordered based on the Cholesky decomposition by putting the most endogenous variable last, while each variable does not contemporaneously affect the preceding variables. Generally, the non-policy variables are ordered first before the policy variables with the assumption that the non-policy variables respond to the policy variables with a lag (Bernanke & Blinder, 1992; Bernanke & Gertler, 1995; Peersman & Smets, 2001).

Unlike the recursive VAR, the non-recursive VAR/SVAR assumes a reciprocal causation among the variables and that the residuals are correlated. The non-recursive VARs or SVARs impose restrictions on the contemporaneous relationships among the endogenous variables based on economic intuition/theory and institutional structure of the economy to recover the structural shocks and parameters using reduced-form estimation. Various forms of SVARs have been employed by authors such as Kim and Roubini (2000), Bernanke and Blinder (1998), and Sims and Zha (1998) in analysing monetary policy transmission mechanisms. The main limitation of SVAR is that wrong assumption about the structure will produce misleading

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impulse responses. Hence, proper identification of the structural shocks is very important.

Related to identification restrictions in SVAR is the short-run and long-run restrictions. Amisano and Giannini (1997) proposed AB model to impose short-run restrictions. For AB model, the residuals are assumed to have a linear relationship with the structural shocks, $(\mathcal{E}_t,)$ such that $\nu_t = B\mathcal{E}_t,$

where B is (nxn) diagonal matrix. Blanchard and Quah (1989), on the other hand, introduced long-run restrictions in examining the joint behaviour of output, employment, prices and wages on aggregate demand and supply in the United States. Both short-run and long-run restrictions are used in SVAR models by various authors to suit their purpose of the study.

The Theoretical Basis for Central Bank Independence

The degree of CBI plays important role in delivering low and stable inflation. Issing (2006) defined CBI as 'institutional independence, implying a set of legal provisions that guarantee that the CB carries out its tasks and duties without political, and more generally, external interference" (p.67). The theoretical case for CBI in the conduct of monetary policy stemmed from the desire to counter inflationary bias resulting from the problem of time or dynamic inconsistency (Barro & Gordon, 1983a, 1983b; Kydland & Prescott, 1977).

The time inconsistent theory argues that a discretionary monetary policy pursued by monetary authority which is politically dependent on the government may lead to inflationary bias. According to the literature, governments have a strong incentive to create inflation by exploiting the short-run trade-off between unemployment and inflation predicted by the

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Philips curve by increasing employment rate so as to win the favour of the electorate as pointed out by Fischer (2015), Polillo and Guilen (2005), and Fuhrer (1997).

To address the inflationary bias of dynamic inconsistency, Barro and Gordon (1983b), and Kydland and Prescott (1977) proposed that monetary policy should be determined by rules rather than discretion to avoid inflationary bias. In contrast, two main approaches that have been suggested in the literature to eliminate inflationary bias are the conservative banker approach of Rogoff (1985) and the principal-agent approach of Walsh (1995) and Persson and Tabellini (1993) as pointed out by Fischer (1995).

Rogoff (1985) suggested that inflationary bias could be reduced by appointing an independent and conservative central banker, with a greater dislike for inflation than the general public. Walsh (1995), alternatively, proposed incentive-compatible contract for central banker that ties remuneration to inflation performance as a solution to inflationary bias problem. In this case, a penalty is imposed on the central banker when he fails to achieve the inflation target or deviates from the optimal level.

On the contrary, other authors including Forder (1996) and McCallum (1995) have cast doubts on the claim that CBI may lower inflation. McCallum (1995) criticised both approaches proposed as inappropriate means of eliminating inflationary bias of time inconsistency. He argued that rules are not necessarily needed for proper policy behaviour in eliminating inflation bias, but rather a strong determination to "do the right thing", as Fuhrer (1997, p. 21) put it, is all that is needed to avoid inflationary bias. He further pointed

out that the incentive-compatible contract approach cannot overcome the time inconsistency problem since it is reallocated to the government.

Types of central bank independence

Different types of CBI have been defined in the literature. These include legal independence, goal independence (political independence) and instrument or operational independence (economic independence). Legal independence relates to the laws conferred on the CB as an independent institution by the legislators in the conduct of monetary policy. Political independence, on the other hand, is defined as the ability of the CB to choose the ultimate goals of monetary policy. Economic independence refers to the capacity to choose monetary policy instruments to achieve the final goals without government restrictions (Bade & Prkins, 1982; Grilli, Masciandaro & Tabellini, 1991).

In contrast, Debelle and Fischer (1995) made a distinction between goal and instrument independence. The goal independence allows CB to set its own ultimate goal(s) while the instrument independence allows the CB to deploy monetary policy instruments to achieve its ultimate goal(s). The consensus in the literature is that the CBs should not have goal independence. Thus, the goals of monetary policy should be determined by the fiscal authorities; the CBs should deploy policy instruments to achieve the ultimate goals in order to ensure accountability and transparency for their actions (Bernanke, 2010; Debelle & Fischer, 1995; Fischer, 1995).

Monetary and Fiscal Policy Coordination

Policy coordination between monetary and fiscal authorities is paramount in ensuring price stability and sustainable economic growth. The

ultimate objective of monetary and fiscal policies is to achieve a stable and non-inflationary economic growth including favourable external accounts (Hasan & Isgut, 2009; Laurens & De la Piedra, 1998). The attainment of price stability and economic growth therefore depends on the level of coordination between monetary and fiscal authorities in the management of an economy.

Furthermore, the need for effective corroboration between fiscal and monetary policies in the pursuit of their policy objectives arises from the fact that individual policy instruments have an impact on more than one policy target Hasan and Isgut (2009). This suggests that the achievement of a desired target by the fiscal authority may have undesired effects on the achievement of other policy targets by the monetary authority thereby creating macroeconomic distortions. The interdependence between fiscal and monetary authorities in implementing their respective policy objectives necessarily requires a strong policy coordination in order to maximize society's welfare (Andlib, Khan, & Haq, 2012; Tarawalie *et al.,* 2013).

On the other hand, lack of effective policy coordination may have deleterious effects on the economy resulting in high interest rates, exchange rate depreciation, high cost of debt servicing and poor economic growth. Blinder (1982) argued that lack of policy coordination between fiscal and monetary authorities could be attributed to either one or a combination of three causes namely: (i) different objectives of both fiscal and monetary authorities towards the economy; (ii) different opinions of both fiscal and monetary authorities about the possible effects of their actions emanating from different economic theories and (iii) different forecasts about the state of the economy made by the two authorities in the absence of policy intervention.

Monetary and policy coordination takes different forms depending on the institutional setting in which monetary and fiscal policies take place (Hasan & Isgut, 2009; Laurens & De La Pieddra, 1998). Laurens and De La Pieddra (1998) described how monetary and fiscal policy coordination works in four stages of financial market development. During the early stages of financial market development or in an underdeveloped financial market where there is no market for government debt and the CB finances almost entirely the fiscal deficits, the monetary policy tends to be subservient to fiscal policy. To achieve policy coordination under this circumstance, formal rules in a form of broad money programming framework must be set to constrain excessive expansion of domestic credit.

In a relatively developed financial market where interest rates signalling role increase in the economy and the CB has less control over broad money, policy coordination will be achieved through rules set out in a reserve money programming framework. Finally, when the financial market is fully developed coupled with secondary market for government debt instruments, fiscal deficits impact interest rates and economic growth as observed by Tarawalie *et al.* (2013). The policy coordination under this circumstance will be to reduce the high interest rate and costs of government debt as well as maintain credible and stable market conditions. Policy coordination in this environment becomes market-driven with no formal rules as the monetary and fiscal authorities seek to achieve credibility in the economy.

According to Hanif and Arby (2008, p.3), monetary and fiscal policy coordination aims at achieving the following interrelated objectives:

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a. To set internally consistent and mutually agreed targets of monetary and fiscal policies with a view to achieve non-inflationary stable growth.

b. To facilitate effective implementation of policy decisions to achieve the set targets of monetary and fiscal policies efficiently through mutually supportive information sharing and purposeful discussions.

c. To compel both the CB and government to adopt a sustainable policy.

Nonetheless, various countries have institutional arrangements in place, which provide platforms to fiscal and monetary authorities for broader discussions and consultations on fiscal and monetary policies with the view to achieving better macroeconomic performance. For example, in Ghana, although there is no formalised policy coordination, there are some platforms for broad policy discussions and consultations between the fiscal and monetary authorities. The key committees whose functions have some coordination elements include the Economic Management Team (EMT), Monetary Policy Committee (MPC) and the Treasury Committee as noted by Tarawalie *et al.* (2013).

Central Bank Communication, Transparency and Accountability

CB communication is widely accepted as an important tool to shape and anchor the public's inflationary expectations towards achieving price stability including financial stability. Effective communication with the public about monetary policy decision making process is expected to keep the public well informed and help influence their market expectations of future short-

term rates, which, in turn, influence long-term rates, inflation and output (Bawumia, 2010; Blinder, Fratzscher, De Haan & Jansen, 2008).

Moreover, Blinder *et al.* (2008, p.10) defined CB communication as "the provision of information by the CB to the general public regarding such matters as the objectives of monetary policies, the policy strategy, the economic outlook and the outlook for future policy decision". The literature shows that CB communication has improved significantly over the past two and half decades, especially, after the global financial crises and the emergence of new technology and social media (Bascand, 2013; Born, Ehrmann & Fratzscher, 2011; Kedan & Staurt, 2014).

Nevertheless, there is no optimal communication strategy by CBs and therefore different approaches are adopted by various CBs in communicating monetary policy decisions to the public. The main communication channels used by CBs include conferences, press releases, speeches, publication of monetary policy committee (MPC) minutes, forecasts, bulletins and transcripts (Blinder *et al.,* 2008; De Haan, Eijffinger & Rybiński, 2007; Kedan & Staurt, 2014).

According to Woodford (2005), CBs communicate at least about four broad classes of issues encompassing:

   a. Economic conditions including the CB's view of the outlook for the future;

   b. Policy decisions made by the CB about the operating targets;

   c. Strategy that guides policy decisions;

   d. Outlook for the future policy.

Furthermore, Naghadiyev (2011), drawing from Bernanke (2007), distinguished between the main objective and intermediate objectives of CBs in relation to the final objective of CB communication. Naghadiyev (2011) suggested that the main objective of the CB communication should focus on formulation of adequate expectations of the public with respect to the decisions taken by policymakers. The intermediate objectives of the CB communication comprise transparency, accountability and credibility. The credibility is considered the most vital aspect of CB communication without which formulation of adequate public expectations would be difficult to achieve.

Prior to 1990s, the CBs were less opened in disclosing vital information about their operations to the public; their activities were shrouded in secrecy (Blinder *et al.,* 2008; De Haan *et al.,* 2007). Mishkin (2004) attributed the opaque nature of CB communications to the desire of bureaucracy to maximise prestige and power and to avoid accountability. However, transparency of CB decision-making has improved significantly in recent times with the adoption of inflation targeting (IT) framework (Blinder *et al.,* 2008; De Haan *et al.,* 2007). The broad consensus in the literature is that transparency may enhance monetary policy effectiveness (Bernanke *et al.* 1999) and improve the predictability of monetary policy decisions (Blinder *et al.,* 2008).

Transparency has been defined by Walsh (2003) as the ability to monitor the central's performance. Eijffinger and Geraats (2006, p.3), on the other hand, defined transparency "as the extent to which CBs disclose information that is related to the policymaking process". The general notion of

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transparency implies a reduction or elimination of information asymmetries between the CBs and the private sector. The case for increased transparency of CB is premised on the requirement for greater accountability of the independent CBs (Blinder *et al.,* 2008; De Haan *et al.,* 2007; Eijffinger & Geraats, 2006).

In addition, Geraats (2002) distinguished five aspects of transparency comprising political, economic, procedural, policy and operational transparencies.

a. Political transparency refers to the openness about formal objectives of monetary policy including qualitative targets which is enhanced by institutional arrangement.

b. Economic transparency relates to economic information that CB uses for monetary policy. This includes the data, policy models and the internal forecasts.

c. Procedural transparency concerns how policy decisions are taken and the procedure (strategy, release of minutes and voting records) through which the policies are being implemented.

d. Policy transparency deals with a prompt announcement of policy decision, explanation of decision and policy inclination.

e. Operational transparency relates to the implementation of CB's policy actions. It involves a discussion of error control, monetary transmission shocks and the policy outcome.

However, there is no consensus on what constitutes optimal transparency of CB (Geraats, 2002). There are divergent views on the effect of greater CB transparency on the economic welfare. A number of studies argued

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that greater CB transparency enhances economic welfare as it reduces inflation bias while other strand of literature argued that greater transparency beyond certain threshold is deleterious to monetary policy and reduces welfare (Blinder *et al.,* 2008; Cukierman, 2009).

The proponents of CB transparency have argued that greater CB transparency boost the effectiveness of monetary policy. For instance, Bernanke *et al.* (1999) emphasised the role of transparency in enhancing monetary policy effectiveness while Blinder *et al.* (2008) noted that CB transparency may increase the predictability of monetary policy decisions. According to Cukierman (2009), CB transparency enhances the democratic accountability of the CB and control of the public's inflation expectations. The literature also suggests that transparency may reduce uncertainty in financial markets (Chortareas, Stasavage & Sterne, 2002), increase the credibility of the CB and result in less inflation persistence (De Haan *et al.,* 2007).

In contrast, other authors who cast doubt on full transparency argued that greater levels of transparency are deleterious to CB objective of achieving price stability and have negative effect on welfare (Cukierman, 2009; Geraats, 2007). Cukierman (2009, p.15), for instance, argued that "*beyond a certain threshold, high levels of transparency may make it easier for political authorities to exert political influence on the CB and complicate the achievement of price stability"*. Geraats (2007) also showed that the tendency for political authorities to override the CB's decisions is less likely to be enforced when they do not have sufficient information about the economic environment. Therefore, certain level of opacity on the part of the CB would

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help maintain its independence and shield the economy from excessive inflation (Cukierman, 2009).

Furthermore, the advent of the IT framework has improved the accountability of monetary policy through effective communication strategy and transparency of the CB. The operational independence of the CB requires that the monetary authorities account for their policy actions to the government or the public (De Haan & Oosterloo, 2007; Siklos, 2003). Accountability of the CB largely thrives on transparency (De Haan & Oosterloo, 2007; Eijffinger & Hoeberichts, 2002).

Moreover, there are certain features that guide CB accountability to the public. Geraats (undated) observed that the accountability relates to the functions and objectives of the CB as well as the use of its resources. She identified three characteristics of accountability comprising:

a. scrutiny by others;

b. regular accounting for one's actions; and

c. the risk of negative repercussions, if performance is considered unsatisfactory.

Eijffinger and Hoeberichts (2002), on their part, distinguished between three main features of CB accountability:

1. decisions about the explicit definition and ranking of objectives of monetary policy.

2. transparency of actual monetary policy

3. who bears final responsibility with respect to monetary policy?

Accountability, therefore, centres on an evaluation of performance of the CBs policy actions (Geraats, undated). Generally, CBs are required to

report regularly to the public on their past performance and future plans for monetary policy through speeches, press conferences, publication of minutes among others (Eijffinger & Hoeberichts, 2002). In certain jurisdictions, particularly, in developed inflation targeting countries such New Zealand, UK and Norway, the governor of the CB is mandated by law to appear before the parliament to explain the policy actions or write an open letter or a report when targets are missed.

Theories on Price Level Determination

Monetarist view of price level determination

The monetarist view which is rooted in the quantity theory of money asserts that only "money matters" in the determination of prices. That is, changes in the general price level are caused by changes in money supply given a constant velocity of money and nominal income. This forms the basis of the monetarist statement, "inflation is always and everywhere a monetary phenomenon" (Friedman, 1970, p.11). The implication of the monetarist theory of determination of price level is that the monetary authority should have control over prices and that it should be independent of fiscal authority to achieve price stability.

The Keynesian view of price level determination

The Keynesians emphasise the increase in aggregate demand as the source of demand-pull inflation. According to the Keynesian view, inflation occurs when aggregate demand for final goods and services exceeds the aggregate output at full employment level. The increase in aggregate demand results from the expansion in government spending, household consumption,

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exports and investment expenditure. The larger the gap between aggregate demand and aggregate supply, the more rapid is the inflation (Keynes, 1936).

The Structuralist view of price level determination

The Structuralists, on the other hand, argue that structural and institutional factors play significant role in inflation dynamics in developing countries. They emphasise supply-side sources of inflation arising from rising costs of production which emanate from rising labour cost and input prices as the sources of inflation in developing countries (Bernanke, 2005). In particular, inelastic food supply, inadequate infrastructural facilities, which adversely affect distribution of output, lack of financial resources and low export receipts, which lead to foreign exchange shortages, in developing countries have been identified as factors that fuel inflation (London, 1989).

The fiscal theory of price level

The fiscal theory of the price level (FTPL) developed by Cochrane (1998, 2000), Woodford (1994, 1995, 1998), Sims (1994) and Leeper (1991) among others sought to explain another channel through which fiscal policy determines price level in an economy. Sargent and Wallace (1981), in their seminal paper, showed that tighter monetary policy could lead to higher inflation under certain circumstances where monetary policy is under the fiscal pressure and budget deficits monetised after certain threshold. The conclusion of the paper is that the ability of the monetary authority to curb inflation depends critically on its coordination with the fiscal authority.

In contrast to the monetarists view, the proponents of the FTPL argued that in an economy where fiscal policy is dominant (a non-Ricardian regime), the price level is determined through the inter-temporal government budget

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constraint. That is, prices are determined by the level of public debt (Woodford, 2001). Under such circumstance, government may not adjust its primary surpluses to guarantee the solvency of the public sector debt. Therefore, any increase in nominal public debt to finance persistent budget deficits would be perceived by the private agents as an increase in nominal wealth. Hence, increase in demand for goods and services will put pressure on prices (Kwon, Mcfarlane & Robinson, 2009). An increase in price level will erode the real value of public debt and in turn, the real value of financial wealth until demand equals supply. Hence, the inflation becomes a fiscal phenomenon (Baldini & Poplawski-Ribeiro, 2011).

The thrust of the FTPL is that attainment of price stability in an economy dominated by fiscal policy, a non-Ricardian regime, is impossible regardless of the independence of the CB unless government intertemporal solvency is guaranteed. Hence, for independent CBs to achieve price stability, they must convince the fiscal authorities to adopt appropriate fiscal policy (Christiano & Fitzgerald, 2000; Fialho & Portugal, 2005). This therefore calls for a strong policy coordination and collaboration between the monetary and fiscal authorities.

Empirical Literature

This section focuses on a review of empirical literature on monetary transmission mechanism and CBI. It also reviews empirical studies on CB communication and transparency. The section concludes with a review of empirical studies on price level determination.

Monetary Transmission Mechanism

This section is devoted to review studies on monetary transmission mechanism with emphasis on the West African Monetary Zone. For instance, Mishra *et al.* (2014) studied the transmission of monetary policy shocks to lending rates in a large sample of 132 countries over the period 1978 to 2013. Mishra *et al.* (2014) used a heterogeneous structural panel VAR approach and long-run restrictions to identify the shocks. The study provided evidence of wide variation in the response of bank lending rates to a monetary policy innovation across countries. The results showed that monetary policy shocks affected bank lending rates in the theoretically expected direction in countries that have better institutional frameworks, more developed financial structures, and less concentrated banking systems. The study also found that low-income countries exhibited much weaker transmission of monetary policy shocks to bank lending rates than the advanced and emerging economies.

Furthermore, Mallick and Sousa (2011) investigated the real effect of monetary policy transmission for five key emerging market economies comprising Brazil, Russia, India, China, and South Africa (BRICS) using quarterly time series data for the period 1990:1 to 2008:4. Mallick and Sousa (2011) considered short-term interest rate as monetary policy instrument and applied both Bayesian SVAR along with sign restrictions approach and Panel Vector Autoregression framework for the analysis. They reported that contractionary monetary policy has a strong and negative effect on output. The results also showed that contractionary monetary policy shocks stabilise inflation in those countries in the short term while producing a strongly persistent negative effect on real equity prices.

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Moreover, other studies including Krušec (2011) and Star (2006) focused on the analysis monetary transmission mechanism in Eastern European countries. For instance, Krušec (2011) estimated the monetary transmission policy mechanisms for four inflation-targeting new EU members consisting of the Czech Republic, Hungary, Slovakia and Poland using monthly time series data between 1994:1 and 2009:10, and structural vector error-correction model. Krušec (2011) found that a restrictive monetary policy shock has a significant negative effect on the inflation rate in all the four countries. Krušec (2011) concluded that inflation targeting was likely to be an effective strategy for the candidate countries to join the European Monetary Union.

In addition, Rafig and Mallick (2008) examined the effect of monetary policy shocks on output in the three largest euro area economies comprising Germany, France and Italy using quarterly time series data from 1980Q1 to 2005Q4 and applying sign restriction VAR approach. Narrow money (M1) was used as monetary policy indicator along with the real effective exchange rate for the study. Rafiq and Mallick (2008) found that monetary policy innovations through interest rate are most potent in influencing output in Germany, but had a modest effect on output in France and Portugal. They concluded that the differences in magnitude and timing of the dynamic responses of output across the EMU indicate heterogeneity in the transmission mechanism of monetary policy.

Moreover, studies in advanced economies such as the US and Western Europe by Boivin and Giannani (2006), Bernanke, Boivin and Eliaz. (2005), Bernanke and Mihov (1998), and Bernanke and Blinder (1992) have

established that changes in monetary policy have significant positive effects on real output and inflation. Interest rate channel has also been found to be the most important channel of monetary transmission in the developed economies.

On the other hand, empirical findings on the effectiveness of monetary policy Sub-Sahara Africa are mixed. Works including Davoodi *et al.* (2013), Montiel (2013), Montiel, Adam Mbowe and O'Connell (2012), Mugume (2011), Ngalawa and Viegi (2011) have provided empirical findings in the proposed East African Monetary Union (EAMU). In Uganda, Montiel (2013) examined the strength of monetary transmission using monthly data from 2001:12 to 2011:6 and VAR method. The study found that shocks to monetary base, a proxy of monetary policy, has statistically significant effects on the exchange rate, bank lending rate and the price level consistent with economic theory, but did not have any significant impact on aggregate demand.

Davoodi *et al.* (2013) also examined the effectiveness of channels of monetary transmission in the proposed EAMU using monthly data from 2000 to 2010 and recursive SVAR complemented with BVAR and factor-augmented VAR approaches. The study, using base money and treasury bill rate as monetary policy instruments reported that the channels of monetary transmission were generally weak and their relevance varies across countries. The study also provided evidence that suggests that the two monetary policy instruments, reserve money and treasury bill rate, used in the Community sometimes move in opposite directions that exert offsetting expansionary and contractionary effects on inflation which may pose challenges to harmonisation of monetary policies across the East African Community.

Moreover, Mugume (2011) examined monetary policy transmission in Uganda in the light of the Bank of Uganda's preparation towards adoption of inflation targeting regime over the medium-term using quarterly time series data and SVAR approach. The study using treasury bill rate as a monetary policy indicator, found interest rate channel to be weak even though there was strong evidence of transmission of changes in the treasury bill rate to lending interest rate. The findings of the study concluded that the exchange rate and credit channels appeared to be ineffective.

Furthermore, a study by IMF (2010) on Sub-Sahara Africa reports that monetary policy is somehow more effective than is commonly believed. The study, based on a panel vector autoregression on a sample of Sub-Saharan African countries between 2000 and 2009, showed that a contractionary monetary policy as defined by either a decrease in reserve money growth or an increase in CB's discount rates induced a significant decrease in output and inflation. The results also indicated that an increase in the discount rate although has a significant impact on inflation surprisingly resulted in a rise in inflation.

With regard to the WAMZ countries, most of the studies that have been conducted in Nigeria and Ghana had inconclusive results, especially, in Nigeria. Concerning Nigeria, Adenekan and Ahortor (2013) investigated monetary transmission mechanism using quarterly data from 2000 to 2009 and VAR approach. Using broad money as a monetary policy instrument, Adenekan and Ahortor (2013) found the credit, interest and exchange rate channels to be weak, which according to them, was an indicative of weak and shallow financial system. The study, however, found broad money to be more

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robust and stronger in influencing price movement in Nigeria. In addition, Ogun and Akinlo (2010) using quarterly data from 1986 to 2006 and applying SVAR technique, tested the effectiveness of bank credit channel of monetary transmission with the adoption of deregulatory measures in Nigeria. The study found bank credit channel to be ineffective in Nigeria.

Again, Chuku (2009) using quarterly data from 1986:1 to 2008:4 and recursive SVAR approach, examined the effects of monetary policy shocks proxied by broad money (M2), minimum rediscount rate and the real effective exchange rate on output and price level in Nigeria. The study found that monetary aggregates had modest effects on output and price level with a fast speed of adjustment. However, interest rate and real effective exchange rate had insignificant effect on price level and output.

In contrast, Mbutor (2009) examined the channels of monetary policy transmission using quarterly data from 1998 to 2006 and VAR. Mbutor (2009) found lending rate channel as the strongest and thus, the dominant channel in propagating monetary impulses in Nigeria. The limitation of Mbutor's (2009) study is that it may suffer from degrees of freedom due to the few observations coupled with the seven variables used for estimation. Again, the study did not provide any confidence bounds to judge the statistical significance of the impulse responses.

With respect to Sierra Leone, Ogunkola and Tarawalie (2008) investigated the channels of monetary transmission using quarterly data for the period 1990:1 to 2006:2 and a vector error correction (VEC) model. Ogunkola and Tarawalie (2008) found that monetary policy instrument affects domestic prices and output as expected and evidence of bank lending channel

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in Sierra Leone. The limitation of the study is that no confidence interval was provided to judge the significance of the impulse responses. Also, the study did not provide the impulse responses that established the response of price and real output to innovations in credit.

Regarding The Gambia, Touray (2013) examined the monetary policy transmission mechanism using quarterly data from 1991:1 to 2012:2 and VAR approach. using rediscount rate and monetary base as monetary policy instruments, the study showed that real output and price responded to innovations in monetary policy consistent with economic theory. However, only rediscount policy rate had significant effect on real output. Moreover, the study revealed that shocks to monetary base resulted in depreciation of domestic currency while changes in rediscount rate had moderate pass-through to lending rate.

In the case of Ghana, some studies have been undertaken to evaluate the effectiveness of monetary transmission under inflation targeting regime. Some of these studies focused on interest rate pass-through from policy rate to the retail market interest rate (Acheampong, 2005; Kovanen, 2011; Sakyi *et al.*, 2017) while others investigated the channels of monetary transmission mechanism (Abradu-Otoo *et al.,* 2003).

For instance, in a more recent study, Sakyi, *et al.* (2017 examined the transmission of changes in policy rate to retail lending and deposit interest rates under inflation targeting regime using monthly data over the period 2002:1 to 2016:3. In applying Johansen and Hansen parameter instability cointegration, the FMOLS and DOLS estimation procedures, Sakyi *et al.* (2017) found that, in the long run, policy rate pass-through to commercial

banks' lending and deposit rates was incomplete. The short-run adjustment showed relatively slow transmission of the prime rate to the retail lending and deposit interest rates.

In addition, Loloh (2014) estimated the pass-through impact of exchange rate movements on domestic prices using monthly data over the period 1994:1 to 2012:12 and a recursive VAR. the results showed that the effect of a nominal exchange rate shock on domestic prices is incomplete, broadly modest and decays within 18-24 months. The study also found evidence in support of Taylor's hypothesis that the exchange rate pass-through is positively correlated with the level of inflation.

Similarly, Kovanen (2011) analysed the interest rate pass-through in Ghana using both monthly wholesale market interest rates and quarterly bank-specific interest rates from 2005:1 to 2010:1. The results showed that wholesale market rates responded gradually to changes in monetary policy rate. The study also established that, in the retail market, the pass-through to deposit and lending interest rates was protracted and incomplete.

Acheampong (2005), on the other hand, investigated the pass-through of monetary policy rate proxied by treasury bill rate to commercial banks' lending and deposit rates using monthly data from 1994:9 to 2004:2 and error correction model. The study found that interest rates responded sluggishly to changes in the money market rates. However, the policy shift has some impact on the lending rate decisions of the banks but no significant effect on the borrowing rate.

Furthermore, Abrade-Otoo *et al.* (2003) employed quarterly data for the period 1969:4 to 2002:4 and structural vector error correction model

(SVECM) to investigate the channel of monetary transmission in Ghana. The study used both broad money and treasury bill rate as indicators of monetary policy and generalised impulse response functions for analysis of dynamic relationships among the variables. The study found that none of the policy variables had a significant effect on inflation and real output even though some had expected signs. In addition, all the channels of monetary transmission were weak although exchange rate channel appeared to have had a positive effect on inflation and real output.

Central Bank Independence and Inflation

This section is devoted to the review of empirical literature on CBI and inflation in developed and developing countries. While most of the earlier studies found a significant relationship between CBI and inflation others found no evidence of robust relationship between them with the inclusion of control variables. However, some studies have established that the negative relationship between CBI and inflation remains robust, even with the inclusion of control variables.

Firstly, Agoba, Abor, Osei and Sa-Aadu (2017) examined the effects of financial systems and the quality of political institutions on the effectiveness of CBI in achieving lower inflation for a sample of 48 African countries between 1972 and 2012 using Two Stage Least Squares instrumental variables procedure. The study used legal CBI index computed by Garriga (2016) based on CWN (1992) index for 182 countries over the period of 1970 to 2014 and controlled for several factors including openness, GDP per capita, exchange rate regime, fiscal deficit and indicators of financial development and institutional quality. They reported that, unlike developed countries, CBI

is not enough in achieving lower inflation in Africa and developing countries. However, higher CBI was found to be more effective in lowering inflation in the presence of high levels of banking sector development and institutional quality for both developed and developing countries including Africa which is consistent with the earlier findings of Hielscher and Markwardt (2012).

Moreover, Hielscher and Markwardt (2012) investigated the impact of the quality of political institutions on the link between CBI and inflation for 69 countries for the period 1980 to 1989. CBI was measured by legal independence while institutional quality was proxied by a number of factors comprising democratic accountability, political stability, government effectiveness, regulatory quality, corruption, rule of law and freedom of press. The results found no evidence of a significant linear relationship between changes in CBI and changes in inflation, but a nonlinear relationship between the variables. They found strong evidence which suggests that institutional quality has a significant impact on the relationship between CBI and inflation. They also showed that granting a CB more autonomy does not necessarily lead to better inflation performance. However, sufficiently large change in CBI and high quality of political institutions are the conditions that must be fulfilled to ensure lower inflation.

Furthermore, Kasseeah, Weng and Moheeput (2011) analysed the relationship CBI and inflation for a sample of 20 African countries over the period 1988 to 2007 using panel regression methods. The results indicated that CBI proxied by TOR reduces inflation rate in Africa While controlling for changes in exchange rate, real GDP per capita, trade openness and unemployment rate. They, however, maintained that CBI is not a sufficient

condition to resolve the problem of inflation in African and that other conditions including fiscal discipline are required to ensure effectiveness of CBI in reducing inflation.

In addition, Klomp and De Haan (2010) re-examined the relationship between CBI, proxied by TOR and an indicator based on CB laws in place, and inflation using a dynamic random coefficient model with the Hildreth-Houck estimator for 120 countries for the period 1980 to 2005. Controlling for openness, political stability, real per capita GDP, exchange rate regime and the debt burden they found no robust negative relationship between the indicators of CBI and inflation. In contrast, CBI has a significant effect on inflation for less than 20 per cent of the countries. They concluded that a heterogeneous model is the appropriate model for estimating the relationship between CBI and inflation compared to the pooled OLS estimation techniques used in previous studies.

Also, Jacome and Vazquez (2008) using both GMT legal index and extended CWN index incorporating a measure of CB accountability examined the effect of CBI on inflation in a sample of 24 Latin American and Caribbean countries during 1985–2002. They employed Feasible Generalized Least Squares, Generalized Two-Stage Least Squares and Error Correction Two-Stage Least Squares panel regression methods. The results showed a negative relationship between CBI and inflation for three alternative measures of legal CBI and a positive relationship with TOR, a measure of effective CBI at 1 per cent significant level after controlling for international inflation, financial reforms banking crisis and exchange rate regimes. The result, on the contrary,

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was found to be not entirely robust after the inclusion of an indicator of structural reforms that typically accompany changes in CB legislation.

On the other hand, most of the early studies in the late 1980s and 1990s established a negative relationship between CBI and inflation which suggests that more independent CBs are associated with lower levels of inflation. Among them are the studies by Alesina and Summers (1993), Cukierman (1992), Cukierman, Webb and Neyapti (1992), Grilli *et al.* (1991), and Bade and Parkin (1988).

For instance, Cukierman *et al.* (1992) examined the relationship between CBI and inflation for 72 countries comprising 21 developed and 52 developing countries using four measures of CBI including legal independence and TOR. They found a negative relationship between legal independence and inflation for industrial countries, but no similar result for developing countries. They attributed this to the gap between the law and actual practice particularly in developing countries. In contrast, the results established a strong positive relationship between governor's turnover and inflation in developing countries. They concluded that in developing countries the actual frequency of change of the governor is a better proxy for CBI.

In contrast to the evidence of significant negative relationship between CBI and inflation reported in the earlier studies, other authors including Klomp and De Haan (2010), Bouwman, A-Pin and De Haan (2005), Campillo and Miron (1997), Fuhrer (1997) and Possen (1995) did not find evidence of robust relationship between CBI and inflation. They contested the earlier findings of negative relationship between CBI and inflation mainly on the grounds of omitted variable bias. They argued that once other control

variables are included the statistical significance of the CBI on inflation disappears.

With regard to CB communication and transparency, the empirical literature showed that various CBs communication approaches have different impacts on financial markets and inflation. For instance, Ekor, Adeniyi and Saka (2013) examined the impact of CB communication on monetary policy in Nigeria by applying the standard deviation measure of volatility and VAR approach. The results showed that inflation and markets volatilities reduced during the period of improved CB communication. The results also showed that money market responded positively to CB communication and reverted faster to equilibrium compared with the stock market.

Furthermore, Bonn *et al.* (2011) provided an empirical assessment of the reactions of stock markets to financial stability reports (FSRs), speeches and interviews on financial markets by 37 CBs from 1996 to 2009. They found that FSRs have a significant and potentially long-lasting effect on stock market returns and reduced market volatility. Speeches and interviews, in contrast, have little effect on market returns and do not generate a volatility reduction during tranquil times, but have had a substantial effect during the 2007-2010 financial crisis.

On the other hand, most of the empirical studies on CB transparency focused on the effect of changes in information disclosure practices on certain financial and economic variables while other studies investigated the extent of transparency among a sample of CBs using a single metric index. Empirical studies on CB transparency have established that the level of transparency reduces inflation and improves economic welfare.

Weber (2016), in particular, analysed the relationship between CB transparency and inflation using annual data with information on the Eijffinger-Geraats CB transparency index. The study employed GARCH and other estimation techniques while controlling for a number of variables including GDP growth, real interest rate, money growth an exchange rate. The results showed that transparency reduces inflation expectations. The results were robust even after controlling for other determinants of inflation as results showed that CB transparency seemed to reduce inflation uncertainty. The study, nonetheless, concluded that CB transparency alone is not sufficient to produce stable prices.

Furthermore, Ehrmann, Eijffinger and Fratzscher (2010) determined whether enhanced CB transparency lowers dispersion among professional forecasters of key economic variables in a sample of 12 advanced economies. They found evidence of a significant effect of CB transparency in lowering forecast dispersion. In contrast, the study reported that there is a limit to CB transparency with a decreasing marginal return to enhancing transparency.

Moreover, Chortareas *et al.* (2002) examined the effect of transparency on inflation and output in a cross-section of 87 countries over the period 1995-1999 using on a new data set based on a survey conducted by Fry, Julius, Mahadeva, Roger and Sterne (2000). The results showed that a higher degree of transparency is associated with lower inflation in both inflation targeting and monetary targeting countries. They did not find evidence in support of the proposition that a high degree of transparency is associated with higher output volatility.

In contrast, Egbuna *et al.* (2014) examined the disclosure of explicit information among the CBs in the WAMZ using the transparency index proposed by Ejiffinger and Geraats (2006) and Malik and Din (2008). A weighted transparency index of five key performance indicators (political, economic, procedural, policy and operational) was measured for each country. They reported that The Gambia, Ghana and Nigeria are relatively transparent with overall weighted indexes of 9.5, 11 and 11.5. On the other hand, transparency appeared to be weak in Guinea, Liberia and Sierra Leone with indexes of 5.5, 2.0 and 6.0. They advocated for enhanced CB transparency in the WAMZ countries.

Determinants of Price Level

Different empirical studies had been conducted on the effect of fiscal policy on price level. This empirical literature focuses mainly on the review of related literature on the effect of domestic debt on price level. Nguyen (2016) empirically investigated the relationship between public debt proxied by debt-to-GDP ratio and inflation for 60 developing countries in Asia, Latin America and Africa over the period 1990–2014 using difference panel GMM Arellano-Bond estimation technique. The results showed that public debt has a significant positive effect on inflation in the countries sampled for the study.

Chuku (2014), on the other hand, used quarterly data and a state-space Markov-switching VAR model to analyse the interactions between monetary and fiscal policies in Nigeria between 1970 and 2008. The analysis of impulse response functions generated from VAR model provided evidence of a non-Ricardian fiscal policy in Nigeria. The results indicated that monetary and fiscal policies in Nigeria have interacted in a counteractive manner for most of

the sample period (1980-1994). However, between 1998 and 2008, some form of accommodativeness could be inferred. The overall results suggested that the two policy regimes have been weak strategic substitutes during the post 1970 (Civil War) period. The findings also indicated that inflation predominantly results from fiscal dominance other than lack of monetary controls.

Furthermore, Ahmad *et al.* (2012) investigated the effect of domestic debt on inflation in Pakistan for the period 1972 to 2009 using times series data and OLS estimation technique. The study found that domestic debt and domestic debt servicing had a significant positive effect on price level in Pakistan. They indicated that high cost of domestic borrowing is one of the major reasons for budget deficit in Pakistan.

Moreover, Baldini and Poplawski-Ribeiro (2011) examined the relative importance of fiscal and monetary determinants of inflation for 22 Sub-Saharan African countries using VAR model over the period 1980 to 2005. The results showed that 11 of the SSA countries were characterised by lack of clear anti-inflationary monetary and fiscal policies. The study also found that changes in nominal public debt affect price variability via aggregate demand effects in other countries, suggesting that fiscal outcomes could be a direct source of inflation variability, as predicted by the fiscal theory of the price level.

Kwon *et al.* (2009) in a similar study examined the effect of public debt measured by debt-to-GDP ratio on inflation using panel data spanning 71 countries from 1963 to 2004 and employing dynamic GMM estimator and FMOLS estimation technique. They found evidence of a significant positive

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relationship between public debt and inflation in highly indebted developing countries compared to the developed economies. The study suggested that the risk of a debt-inflation trap is significant in highly indebted countries and that pure money-based stabilisation is unlikely to be effective over the medium term.

In addition, Bildirici and Ersin (2007) investigated the relationship between domestic debt proxied by debt-to-GDP ratio and inflation for a sample of nine countries from 1980 to 2004 using fully modified OLS, dynamic OLS and VECM estimation techniques. The results showed that the emerging countries that experienced high inflation borrowed at higher cost with lower maturity rates. They attributed the increasing cost of borrowing to non-Ricardian fiscal policies. They concluded that it is not the rate of domestic debt/GDP ratio but the cost of borrowing and active fiscal regimes that lessens the immunity of emerging economies to the economic crises.

Apart from effect of fiscal policy, domestic debt or fiscal deficit on price level determination, some studies also looked at other determinants of inflation. For instance, examining the long-run relationships between exchange rate, broad money supply, gross domestic product, interest rate, financial instability, oil price and inflation, Dahiru and Sulong (2017) employed an Autoregressive Distributed Lag (ARDL) technique on annual time series data from year 1970 to 2014. Dahiru and Sulong (2017) found the existence of a long run relationship between exchange rate, broad money supply, oil price, financial instability, interest rate, gross domestic product and inflation.

Furthermore, using monthly data from 2000:1 to 2009:12, Durevall, Loening and Birru (2013) estimated models of inflation to identify important factors contributing to CPI inflation and three of its major components: cereal prices, food prices, and non-food prices in Ethiopia. The general-to-specific modelling and single-equation error correction models were employed for the study. Durevall *et al.* (2013) found that movements in international food and goods prices determined the long-run evolution of domestic prices. In the short run, however, agricultural supply shocks were found to affect food inflation, causing large deviations from long-run price trends. The study recommended the inclusion of world food prices and domestic agricultural production in analysing inflation in developing economies with a large composition of food in consumer price index.

Tarawalie *et al.* (2012) also investigated the effect of changes in the exchange rate on output growth and inflation in the WAMZ economies using quarterly data from 1981 to 2010. The study used vector Autoregressive model to estimate the impulse response and variance decomposition for the variables. The results revealed that real exchange rate depreciation generates inflationary pressures and impact significantly on output growth. In addition, inflation in the zone was found to be partly driven by structural factors.

Moreover, Adu and Marbuah (2011) used quarterly data for the period 1960 to 2009 and ARDL bounds testing approach to cointegration to examine determinants of inflation in Ghana. They found that real output, nominal exchange rate, broad money supply, nominal interest rate and fiscal deficit play a dominant role in the inflationary process in Ghana.

In a more comprehensive study, Thornton (2008) examined the long-run money-inflation relation for 36 African countries using cross-section and panel data analysis. Thornton (2008) observed a weak long-run relation between money growth and inflation for countries when money growth and inflation are below 10 per cent, and a strong relation between money growth and inflation for countries when money growth and inflation move much above that 10 per cent.

Critique of the existing literature

The existing empirical works on the monetary policy transmission mechanism show that some studies have been done in the WAMZ with majority of them conducted in Nigeria and Ghana. Most of the studies in Ghana focused on the pass-through of monetary policy changes to lending rates but not on price level, which is the ultimate target of monetary policy in Ghana. For example, Sakyi *et al.* (2017), Kovanen (2011) and Acheampong (2005) examined the interest rate pass-through in Ghana, but failed to explore the direct impact of changes in policy rate through lending rates on price level and real output. In addition, Chuku (2009) analysed monetary transmission in Nigeria but the study did not account for the channels through which monetary policy shocks are transmitted to prices and real output, which are considered important in monetary transmission mechanism (Abradu-Otoo *et al.* 2003; Mishkin, 1995).

Furthermore, other studies that investigated the channels of transmission used few observations for empirical analyses that might affect the degrees of freedom and reliability of the results as pointed out by Harvey and Cushing (2014) and Davoodi *et al.* (2013). For instance, studies by

Adenekan and Ahortor (2013), Ogun and Akinlo (2010) and Mbutor (2009) for Nigeria and Abradu-Otoo *et al.* (2003) for Ghana used few observations compared to the number of variables used for their studies resulting in few degrees of freedom which cast doubt on the reliability of the results.

In the case of Sierra Leone, Ogunkola and Tarawalie (2008) investigated the channels of monetary transmission and found evidence of strong bank lending channel. However, the study failed to report the confidence bound which aids in judging the significance of the impulse responses as argued by Mishra and Montiel (2013). With regard to The Gambia, Touray (2013) argued that the financial system is dominated by commercial banks and they are expected to play a significant role in facilitating the pass-through effect of the bank lending channel to output. Yet, Touray's (2013) study failed to explore the bank lending channel in The Gambia.

Moreover, most of the studies on CB independence and communication strategy including transparency and accountability were conducted in advanced economies with few panel studies conducted in developing countries including Africa. In the case of the WAMZ, Egbuna *et al.* (2014) evaluated information disclosure by the CBs using quantitative index and found Ghana, The Gambia and Nigeria to be relatively transparent. However, employing quantitative studies alone may not provide in-depth understanding of certain pertinent issues related to CB performance. Hence, it is equally important to employ qualitative approach to better understand the conduct of monetary policy in the WAMZ, particularly, Ghana with the

implementation of the IT. According to Patton (2002), qualitative study provides studies of issues in depth and details.

Furthermore, previous research on price level determination revealed that majority of the studies did not test the FTPL by considering the effect of public debt in price level determination in Sub-Saharan Africa as compared to empirical studies in other countries. Although Baldini and Poplawski-Ribeiro (2011) examined the relative importance of fiscal and monetary determinants of inflation for 22 Sub-Saharan Africa countries. The study mainly dichotomised SSA countries into either fiscally dominant or Ricardian regime. They also provided evidence of inflationary sources through public debt and money supply. The study omitted other structural and cost-push factors that equally explain price level determination in developing countries like Africa.

The study, therefore, fills the gaps highlighted by investigating the effectiveness of monetary transmission in the WAMZ using current time series data spanning 2001 to 2014 and SVAR. Moreover, the qualitative study on the conduct of monetary policy in Ghana will provide better understanding on issues relating to the implementation of inflation targeting in Ghana.

Conclusion

Chapter Three provides both theoretical and empirical literature which serve as the foundation for the empirical study. The literature theoretical on monetary transmission mechanism shows that the effectiveness of channels of monetary transmission depends among other things on the financial structure, the openness of the economy and the choice of the monetary policy indicators. The improvement in CB communication strategy has enhanced CB transparency and accountability, especially, with the adoption of inflation

targeting framework. With regard to the price level determination, the literature indicates that price level is determined mainly by structural, monetary and fiscal factors.

Moreover, the empirical literature on monetary transmission mechanism shows that interest rate channel is the most effective channel in advanced economies. In the case of Sub-Saharan Africa including the WAMZ, the findings are mixed. Empirical literature also suggests that the quality of institutions and level of financial development play major role in enhancing CBI in achieving lower inflation. In addition, CB communication has significant positive effect on financial markets and reduces inflation while greater transparency reduces inflation bias and forecast dispersion of economic variables. Also, the empirical literature reveals that the level of public debt has a significant positive effect on price level confirming the FTPL.

CHAPTER FOUR

RESEARCH METHODS

Introduction

Chapter Four discusses the research methods employed for the study. It is divided into five parts. Parts one and two focus on the exposition on the research philosophy underpinning the study and research design used to achieve the purpose of the study. The theoretical and empirical models for channels of monetary transmission and effect of domestic debt on price level for WAMZ countries are presented in parts three and five. Dataset used for both studies are also described after the empirical specification of models. Part four is devoted to the description of the conceptual framework and procedure employed for data collection and analysis of the qualitative study on the conduct of monetary policy in Ghana.

Research Philosophy

Positivist and interpretivist philosophies were adopted as a foundation for the study because the thesis employed mixed methods. The positivists hold the view that reality is stable and can be observed, described and measured objectively without interfering with the phenomena being studied (Levin, 1988). They claim that social sciences have similar characteristics with natural sciences and therefore can be studied in the same objective way. They emphasise on facts as distinct from values or meanings people ascribe to a phenomenon and the use of the scientific method in testing hypotheses based on theories.

Barbbie (2005) observed that positivists seek to objectively measure, explain, and predict events in the social world by pointing out the regularities

and causal relationship between events. Given the quantitative design and the explanatory nature of the study, positivism is appropriate for this study which seeks to test hypotheses and establish relationships among quantitative variables. Thus, positivist approach is used as the foundation for the first and third objectives of the study.

Although positivist school of thought provides foundation for empirical study of relationships among variables in an objective manner, it rules out the fact that knowledge and theories could be developed from multiple sources including personal experiences and beliefs. In response to this limitation, the interpretivist school of thought posits that our knowledge of reality is a social construction by human actors (Walsham, 1995). As Bryman and Bell (2011) put it:

> they shared they view that the subject matter of the social sciences—people and their institutions—is fundamentally different from that of the natural sciences. The study of the social world, therefore, requires a different logic of research procedure, one that reflects the distinctiveness of humans as against the natural order (p. 16).

The interpretivists hold the view that reality exists, but it cannot be measured directly; it can be perceived by the individuals through the lens of his or her prior experience, knowledge and expectations. Consequently, the lens influences what individuals see and how they interpret what they find (Rubin & Rubin, 2012). According to the interpretive constructionism, "*the core of understanding is learning what people make of the world around them, how people interpret what they encounter, and how they assign*

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meanings and values to events or objects" (ibid, p. 19). According to Robson (2002), reality is based on an individual's perceptions and experiences.

Since the purpose of interpretivism is to understand the world from the individual's viewpoint through collection of data via interviews, focus group discussions for interpretation, I considered it as an appropriate philosophy for the second objective of the study. The second objective explores the perception of experts on the conduct of monetary policy in Ghana.

Research Design

The thesis employed mixed methods to achieve the purpose of the study. The quantitative research approach is most suitable for the first and third objectives of the study which examine the channels of monetary policy transmission and effect of domestic debt on price level in the WAMZ, respectively. Quantitative approach enables a researcher to objectively examine the causal relationships existing among the quantitative variables through testing of hypotheses.

Moreover, since the study sought to establish the causal relationships among the variables, explanatory research was used. The explanatory design enables the researcher to provide explanations to the nature and magnitude of causal relationships among the variables being investigated. Furthermore, given the subject matter of the thesis, effectiveness of monetary policy, I followed the thoughts of the New Keynesian Economists for the quantitative study.

The qualitative approach, on the other hand, allows the researcher to provide in-depth understanding of issues or phenomena under study based on the views, perceptions, opinions, experiences and the meanings people ascribe

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to certain phenomena. Patton (2002) argued that qualitative research methods facilitate studies on issues in depth and details. In connection with the purpose of the second empirical chapter which explores the perception of experts on the conduct of monetary policy in Ghana, I chose qualitative approach as the appropriate research approach for the study.

Channels of Monetary Policy Transmission in the WAMZ

This section discusses the models employed to investigate the effectiveness of monetary transmission mechanism in the WAMZ. The models relate mainly to the country-specific analyses of channels of monetary transmission mechanism in the WAMZ countries. This is followed by the description and justification of various variables used for the estimations. The sources of data used for the estimations are also highlighted.

Theoretical Model for Monetary Transmission Mechanism

This study employs small open economy New Keynesian model (NKM) for analysing monetary policy transmission mechanism for the WAMZ countries. The NKM is built on the assumption that the households and firms are rational and forward-looking and maximise their utility functions subject to certain constraints. The market is monopolistically competitive, and the firms do not change their prices frequently, i.e. prices are sticky. The monetary policy is assumed to be non-neutral.

The aggregate relationships used in the SVAR framework are derived from dynamic general equilibrium models where private agents are assumed to be rational and forward-looking (Leu, 2011). The relationships among the agents are characterised by the following set of equations: a dynamic aggregate demand (IS) equation, an aggregate supply (AS) equation or New

Keynesian Phillips curve (NKPC) based on Calvo's (1983) staggered price model, the uncovered interest rate parity, and a forward-looking monetary policy rule.

IS equation

The open economy IS equation is specified below as it has been described by Leu (2011) and extended by McCallum and Nelson (2000, 1999).

$$x_t = \alpha_0 + E_t x_{t+1} - \alpha_1 (i_t - E_t \pi_{t+1}) + \alpha_2 (s_t + p_t^* - p_t) + \varepsilon_t^x \quad (1)$$

where x_t is the output gap, i_t is the nominal short-term interest rate, π_t is the inflation rate, s_t is the exchange rate expressed as the domestic currency cost of one unit of foreign currency, p_t is the general domestic price level, p_t^* denotes foreign price level, and E_t is expectation conditional on the information set available to economic agents at time *t*. In addition, $(s_t + p_t^* - p_t)$ represents real exchange rate while ε_t^x can be interpreted as the aggregate demand shock to the domestic economy.

Equation (1) is a forward looking IS curve which is different from the traditional IS curve due to the fact that the current output is dependent on the level of future expected output. The real interest rate effect, $(i_t - E_t \pi_{t+1})$, has a negative relationship with current output which indicates the intertemporal substitution of consumption. A rise in the value of the real exchange rate, (i.e. a real depreciation of the currency) is expected to enhance current output through the expenditure-switching effect (Leu, 2011).

AS equation

An important feature in the NKM in price determination is the combination of nominal rigidities and the optimising behaviour of firms to

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produce forward-looking inflationary dynamics based on Calvo's (1983) staggered nominal price setting. The NKPC is specified as follows:

$$\pi_t = \beta_0 + \beta_1 E_t \pi_{t+1} + \beta_2 x_t + \varepsilon_t^{\pi} \tag{2}$$

where ε_t^{π} is an exogenous aggregate supply shock. The competitive monopolistic firms are assumed to adjust their prices infrequently based on a random probability (Calvo, 1983). The firms are much more concerned about future inflation because it may be unable to adjust the price for some periods in the future. Current inflation in the New Philips curve depends on the future expected inflation unlike the standard Philips curve where current inflation depends on the past inflation (Leu, 2011).

Uncovered interest parity

An important aspect of most small open economy models is the addition of the uncovered interest parity condition to describe the nominal exchange rate as given by:

$$s_t = E_t s_{t+1} - (i_t - i_t^*) + \varepsilon_t^{s} \tag{3}$$

where i_t^* denotes foreign nominal short-term interest rate and the time-varying risk premium shock, ε_t^{s}, reflects temporary departures from the interest parity condition.

A forward-looking monetary policy rule

The final part of the NKM model is the addition of a forward-looking monetary policy rule proposed by Taylor (1993). The monetary policy rule is specified as:

$$i_t = \gamma_0 + \pi_t + \gamma_1 (E_t \pi_{t+1} - \pi^T) + \gamma_2 x_t + \varepsilon_t^{i} \tag{4}$$

where i_t depicts the nominal interest rate, π^T is the target inflation rate while ε_t^i indicates the monetary policy shock. The CB responds to expected future inflation deviations from its target inflation and output gap.

With regard to the monetary policy rule, two different monetary policy indicators were used for the study to reflect the types of monetary policy frameworks operated by the various WAMZ countries. Ghana which operates inflation targeting framework uses policy rate, a short-term nominal interest rate, as the main monetary policy instrument. This makes it suitable for the monetary policy rule proposed by Taylor (1993) and the NKM in particular. However, since the Taylor-type monetary policy rule uses short-term nominal interest rate and omits the role of money supply, a modified monetary policy rule that uses the growth rate of money supply proposed by McCallum (2012) would be appropriate for the monetary targeting WAMZ countries.

The modified monetary policy rule can be specified as:

$$\Delta m_t = \theta_0 + \theta_1 m_{t-1} + \theta_2 \pi_t + \theta_3 x_t + \varepsilon_t^m \tag{5}$$

where growth rate of money supply, Δm_t, is related to inflation rate, π_t, and output gap, x_t. ε_t^m can be considered as the monetary policy shock. Given that the monetary targeting WAMZ countries use base money or reserve money as their operating target, base money was employed as the monetary policy indicator.

Specification of SVAR Model

Although researchers such as Labus and Labus (2017) and Allegret and Benkodja (2015) favoured the application of dynamic stochastic general equilibrium (DSGE) models in analysing dynamic relationships among macroeconomic variables, others cast doubts on the DSGE models in

producing reliable results. Sims (2006), for instance, argued that DSGE models are only story-telling devices and not hard scientific theories. Tavor (2009) also pointed out that estimates based on the DSGE models may be misleading if the model is misspecified and parameters wrongly identified.

In response to the critique of the DSGE models, SVAR models have been proposed as an alternative to the DSGE models. SVAR models are extensively used by policy makers and researchers in analysing monetary transmission mechanism. Kamati (2014) argued that SVAR avoids incredible restrictions in single equations and strict restrictions in DSGE models. The SVAR models impose some restriction identifications on the endogenous variables to draw some structural conclusions about the system. The SVAR models have been used by Mishra, Montiel and Sengupta (2016), Leu (2011), Kim and Roubini (2000), Sims and Zha (1995) for analysing monetary transmission mechanism in small open economies.

This study therefore employed SVAR to analyse the channels of monetary policy transmission in WAMZ countries. On the other hand, the empirical SVAR models are specified to reflect the differences in monetary policy frameworks (inflation targeting and monetary targeting frameworks) operated by the various WAMZ countries. The study involved country-specific analyses of channels of monetary policy transmission and a panel analysis for the monetary targeting WAMZ countries, respectively.

Specification of SVAR Model for Country-Specific Analyses

In a standard SVAR model, it is assumed that the economy is described by a simultaneous equations model with a structural form given by:

$$A_0 Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \cdots + A_p Y_{t-p} + \varepsilon_t \tag{6}$$

where Y_t is the vector of endogenous variables, ε_t is the vector of structural innovations. The model assumes that $\varepsilon_t \sim N(0,\Sigma)$ and $E(\varepsilon_t, \varepsilon_t') = \Omega$, which is a diagonal matrix. Since the structural model given by Equation (6) cannot be estimated directly because of the possible correlation between the structural innovations and the regressors, the model is transformed model into a reduced form. The reduced form model is obtained by pre-multiplying both sides of Equation (6) with A_0^{-1} as follows:

$$Y_t = A_0^{-1}A_1Y_{t-1} + A_0^{-1}A_2Y_{t-2} + \cdots + A_0^{-1}A_pY_{t-p} + A_0^{-1}\varepsilon_t$$

$$Y_t = \beta_1Y_{t-1} + \beta_2Y_{t-2} + \cdots + \beta_pY_{t-p} + u_t \tag{7}$$

where u_t is the corresponding vector of reduced-form innovations, $u_t = A_0^{-1}\varepsilon_t$ or $\varepsilon_t = A_0u_t$, $E(u_t, u_t') = A_0^{-1}\Omega(A_0^{-1})'$ is the variance covariance matrix of reduced form errors. Moreover, $E(u_t, u_s) = 0$ for all $t \neq s$ and $E[u_t] = 0$.

To identify the structural innovations or parameters from the estimated reduced-form innovations, I imposed restrictions on the system. That is, the system is identified by imposing $\frac{n(n-1)}{2}$ restrictions on the elements of A_0 matrix. The vector of endogenous variables, Y_t, for Ghana is specified as:

$$Y_t = (CEA_t, P_t, LR_t, PC_t, NER_t, PR_t) \tag{8}$$

where CEA_t is the real composite index of economic activity, P_t is the inflation rate, PC_t is credit to private sector, NER_t denotes nominal exchange rate, PR_t represents monetary policy rate.

In contrast, the vector of endogenous variables, Y_t, for monetary targeting WAMZ countries is specified as follows:

$$Y_t = (GDP_t, CPI_t, LR_t, PC_t, NER_t, M0_t) \tag{9}$$

where GDP_t, is the real gross domestic product, CPI_t, denotes price level, LR_t, is the lending rate, PC_t indicates credit to private sector, NER_t, is the nominal

exchange rate and $M0_t$ represents base money. On the other hand, the vector of endogenous variables for the panel SVAR for monetary targeting WAMZ countries is specified as:

$$Y_{it} = (\text{GDP}_{it}, \text{CPI}_{it}, LR_{it}, PC_{it}, NER_{it}, M0_{it}) \tag{10}$$

SVAR identification restrictions for Ghana

The matrix below displays the identification restrictions of the SVAR system. The study followed Amisano and Giannini (1997) AB model to impose short-run restrictions on the VAR system.

$$\begin{bmatrix} e^{CEA} \\ e^{P} \\ e^{LR} \\ e^{PC} \\ e^{NER} \\ e^{PR} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & a_{25} & 0 \\ 0 & 0 & 1 & 0 & 0 & a_{36} \\ 0 & 0 & a_{43} & 1 & 0 & 0 \\ a_{51} & 0 & 0 & 0 & 1 & a_{56} \\ 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} u^{CEA} \\ u^{P} \\ u^{LR} \\ u^{PC} \\ u^{NER} \\ u^{PR} \end{bmatrix}$$

where e^{CEA}, e^{P}, e^{LR}, e^{PC}, e^{NER} and e^{PR} are the structural innovations of the shocks from real composite index of economic activity, inflation rate, lending rate, nominal exchange and policy rate, respectively.

The first two equations represent the production sector, real output and inflation. It is assumed that shocks to CEA contemporaneously affect inflation rate and nominal exchange rate. Because of rigidity in production and inelastic food supply in Ghana coupled with the large import of food items, it is expected that any shock to food supply could induce inflation. This is due to the fact that food items constitute a greater portion of the consumer price index in Ghana. Moreover, Ghana as an import-dependent economy and exporter of mostly primary commodities, it is expected that any term of trade shocks including food supply shock could have negative implications on exchange rate. The increases in commodity prices as results of supply-side

shocks could be passed on to the exchange rate leading to depreciation of domestic currency, the Cedi.

The third and fourth equations relate to the money market sector comprising lending rate and credit to private sector. Lending rate (LR) could have a contemporaneous effect on PC since deposit money banks (DMBs) tend to increase their lending rate in response to an increase in policy rate. PC is also allowed to respond to innovations in other endogenous variables with a lag. The fifth equation is the nominal exchange rate. The nominal exchange rate is expected to have a contemporaneous effect on inflation given that Ghana is an import-dependent small open economy.

The last row represents the CB's reaction function. A shock to PR is allowed to affect lending rate contemporaneously. The rationale for this identification assumption arises from the timely upward adjustment of lending rates by the DMBs in response to increase in monetary policy rate. It is also assumed to have a contemporaneous effect on nominal exchange rate. An increase in monetary policy rate is expected to boost investment in cedi-denominated financial instruments or securities compared to investment in foreign currency foreign-denominated securities. This will lead to appreciation of the local currency, the Cedi. In contrast, shock to policy rate is expected to affect real output and inflation with a lag.

SVAR identification for Monetary Targeting WAMZ countries

The identification restrictions on the A_0 matrix in the SVAR system for individual monetary targeting WAMZ countries as well as its corresponding panel SVAR is described as follows:

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$$
\begin{bmatrix} e^{GDP} \\ e^{CPI} \\ e^{LR} \\ e^{PC} \\ e^{NER} \\ e^{m0} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & a_{25} & 0 \\ 0 & 0 & 1 & 0 & 0 & a_{36} \\ 0 & 0 & a_{43} & 1 & 0 & 0 \\ a_{51} & 0 & 0 & 0 & 1 & a_{56} \\ a_{61} & a_{62} & 0 & 0 & a_{65} & 1 \end{bmatrix} \begin{bmatrix} u^{GDP} \\ u^{CPI} \\ u^{LR} \\ u^{PC} \\ u^{NER} \\ u^{m0} \end{bmatrix}
$$

where e^{GDP}, e^{CPI}, e^{LR}, e^{PC}, e^{NER} and e^{m0} are the structural innovations of the shocks from real output, price level, lending rate, nominal exchange and base money.

The first two equations represent the production sector made up of real output and price. The real output is assumed to contemporaneously affect price level, nominal exchange rate and money supply. The reason for the assumption of contemporaneous impact of real GDP on price level and exchange rate has been explained earlier. In addition to real GDP, CPI and NER are assumed to affect monetary base contemporaneously. This means that the CBs in adjusting their current money supply also monitor the level of real output, price level and exchange rate.

The third and fourth equations relate to the money market sector comprising lending rate and credit to private sector. Credit to private sector is assumed to immediately respond to shocks in lending rate, but it responds to shocks in the other endogenous variables with a lag. The nominal exchange rate is allowed to have a contemporaneous effect on price level since exchange rate it a major determinant of price level in the WAMZ countries, which are import-dependent. Finally, shock to base money is expected to contemporaneously affect lending rate and exchange rate, but it has no immediate effect on real output and price level.

Measurement and Justification of Inclusion Variables

This section describes the measurement and justification for the inclusion of variables used for the study. The a priori expectations involving the dynamics of the variables are also highlighted. All the variables except lending rate and inflation rate were logged. The study used monthly time series data for country-specific studies and quarterly data for a panel analysis of the monetary targeting WAMZ countries. The dataset covers 2001 to 2014.

Real composite index of economic activity (CEA)

Real composite index of economic activity is a monthly index computed by the BoG on monthly basis on key sectors of real economic activities in Ghana. The monthly real composite index of economic activity was used as a proxy of real output, another objective of CB. The data was sourced from the BoG.

Inflation rate (P)

The ultimate objective of the CB of Ghana is the attainment of price stability under inflation targeting regime. The inflation rate is measured as monthly average inflation rate. Abradu-Otoo *et al.* (2003) used inflation rate in their investigation of monetary transmission mechanism in Ghana. The inflation rate was obtained from the BoG.

Monetary policy rate (PR)

Monetary policy rate is the official interest rate used by the BoG as a policy tool to signal the monetary policy stance and to serve as an anchor for inflation expectation as well as all money market rates. Restrictive monetary policy is expected to dampen inflation, output, lending rate, credit to private sector and cause appreciation of the currency. The monetary policy rate has

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been used by Sakyi *et al.* (2017) in analysing interest pass-through in Ghana. The data was also sourced from the BoG.

Monetary base (M0)

This study used monetary base as a monetary policy indicator for monetary targeting WAMZ countries. End of period monthly and quarterly series are used for the study. Mishra and Montiel (2013) argued in favour of the use of monetary base as an appropriate policy indicator for analysing monetary transmission mechanism in monetary targeting countries as compared to Treasury bill rate. Montiel (2013) used monetary base as an indicator in examining monetary transmission mechanism in Uganda. Shock to monetary base is theoretically expected to reduce lending rate, induce an increase in credit to private sector, price level, output in the short-run and cause exchange rate depreciation. Monetary base was sourced from the IMF's International Financial Statistics (IFS) except Guinea, which was obtained from the CB of Guinea.

Real output (GDP)

Real output is used as a proxy of real economic activity for monetary targeting WAMZ countries. In the absence of monthly and quarterly data, the real GDP was interpolated into monthly and quarterly series using Denton (1971) data interpolation approach which was used by Pham (2016) in examining monetary transmission mechanism in Vietnam. The data was sourced from the World Bank's World Development Indicators (WDI).

Price level

Price level is used as one of the key macroeconomic variables in the analysis of monetary transmission mechanism. Both monthly and quarterly

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price levels were used for the study. The price level is measured as the monthly averages of logged consumer price index (2010=100). The quarterly prices are captured as monthly averages of logged consumer price index for each quarter following Harvey and Cushing (2014). The consumer price of index was obtained from the IMF's IFS.

Nominal exchange rate (NER)

Nominal exchange rate has also been used in literature in exploring either the exchange rate channel or exchange rate pass-through to price level. Moreover, since each of the five countries is relatively a small open economy, exchange rate is included to capture any dynamics emanating from the external sector. The nominal exchange rate is measured as the average monthly bilateral local currency to dollar for country-specific studies, but average quarterly bilateral local currency to dollar for the panel study. The bilateral nominal exchange rate is used in this study because almost all the WAMZ countries' external reserves are denominated in US dollars. For instance, Harvey and Cushing (2014) found evidence that suggests that shocks to nominal exchange rate is pro-inflationary. Theoretically, a positive innovation in exchange rate is expected to produce inflationary pressure and boost exports including output. The exchange rate was sourced from the IMF's IFS.

Credit to private sector (PC)

The study also used credit to private sector in consonant with the empirical literature where it is used most often in examining credit (bank lending) channel of monetary transmission. The study used monthly averages of credit to private sector for country-specific analyses while quarterly series

was used for the panel analysis. An increase in credit to private sector, theoretically, is expected to result in increase in output and price level. Mugume (2011) found evidence that credit to private sector shock has a significant effect on price level in Uganda. The data was obtained from the respective CBs.

Lending rate (LR)

Lending rate was used to evaluate lending rate channel in the WAMZ countries consistent with the literature. Lending rate was measured as the weighed monthly and quarterly averages. A positive shock to lending rate is expected to dampen prices and output. The data was also obtained from the respective CBs.

Stationarity Test

In order to test for the stationarity of the series used for the country-specific analyses, the study employed both the Augmented Dickey Fuller (ADF) and Phillips Perron (PP) unit root tests. The ADF and PP tests are the most widely used unit root tests applied in testing stationarity of time series data.

The ADF test ensures that the unit root tests are valid even with the presence of serial correlation of unknown form, say AR(p) process. This may be done by augmenting the equation with lagged values of the differenced variables. The ADF test assumes that the error term is independently and identically distributed. ADF test is thus specified as follows:

$$\Delta Y_t = \mu + \gamma t + \rho Y_{t-1} + \sum_{i=1}^{p} \emptyset_i \Delta Y_{t-i} + \varepsilon_t \tag{11}$$

where Y_t represents the series at time t, Δ is the difference operator, μ, γ, ρ, and $\emptyset$ are the parameters to be estimated, and ε is the stochastic disturbance

term. The ADF tests the null hypothesis that a series contains a unit root (non-stationary) against the alternative hypothesis of no unit root test (stationary).

Since the ADF test has low power in small samples, the study used PP test as a robustness check. Phillips and Perron (1988) suggested a non-parametric method of controlling for higher order autocorrelation in a series. This test is based on the following first order auto-regressive $[AR(1)]$ process:

$$\Delta Y_t = \mu + \rho Y_{t-1} + \varepsilon_t \qquad (12)$$

The non-parametric correction is made to the t-ratio of the β coefficient from equation to account for the autocorrelation of ε_t. This correction is based on an estimate of the spectrum of ε_t at zero frequency that is robust to heteroscedasticity and autocorrelation of unknown form. The null and alternative hypotheses are similar to the ADF test hypothesis. The lag-length selection for the unit root test was based on either, Schwarz information Criterion or Akaike Information Criterion (AIC).

Lag Order Selection Criteria and Diagnostic Test

In order to estimate the SVAR models, the optimal lag lengths for both country-specific SVAR and panel VAR were selected based on five VAR lag order selection criteria. These are: Likelihood Ratio (LR) test statistic, Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC) and Hannan-Quinn Information Criterion (HQ).

Furthermore, post estimation tests were conducted to ensure robustness of the SVAR models estimated for the study. The residuals of the SVAR were tested for autocorrelation and stability condition of the model. The Lagrange Multiplier (LM) test was applied in testing for serial correlation within the residuals of the SVAR while stability tests were conducted to

ascertain whether the impulse response functions generated from the SVAR models return to their long-run equilibrium.

Impulse Response Functions and Forecast Error Variance Decomposition

Impulse response functions (IRFs) and forecast error variance decomposition (FEVD) were generated from the estimated SVAR models to analyse the dynamic interactions among the endogenous variables, particularly, the monetary policy indicators and the non-policy variables such as price level and real output. The IRF traces the effect of an innovation in or shock to a variable on current and future values of the endogenous variables. This could be a shock to policy variable on itself or to the non-policy variables. FEVD, on the other hand, helps to explain the relative importance of a structural shock to the endogenous variables within the SVAR system.

The SVAR models were estimated at levels following Sims, Stock and Watson (1990). Sims *et al.* (1990) have shown that differencing non-stationary variables for estimation in VAR is unnecessary since analysis in levels is appropriate and the OLS estimator of the reduced-form VAR is consistent whether or not the VAR contains unit roots or cointegrated variables. Similarly, Gospodinov, Herrera and Pesavento (2013) building on the work of Sims *et al.* (1990) noted that estimating IRFs from unrestricted VAR in levels tends to be more robust than estimation from unit root pre-test VAR models whether differenced VAR or VECM.

Assessment of the Conduct of Monetary Policy in Ghana

Part five focuses on the research procedure employed for the qualitative study on the conduct of monetary policy in Ghana. It describes the conceptual framework which underpins the qualitative study including the

data collection and analysis. The conceptual framework was developed based on the review of literature on CBI as discussed earlier. The CBI in this context refers to the operational or instrument independence of the CB. The operational independence of the CB is operationalised as the ability of the CB to deploy its monetary policy instruments to achieve its ultimate goal(s) without political or government interference.

Conceptual Framework

The conceptual framework describes the link between CBI and policy coordination and CB communication strategy in achieving price stability in Ghana under IT regime in line with the purpose of the study. The literature has established that the operational independence alone is not sufficient to enable CB achieve price stability. The CBI should be supported by a strong fiscal discipline, financial development and institutional quality among other things (Agoba *et al.* 2017; Hielscher & Markwardt, 2012).
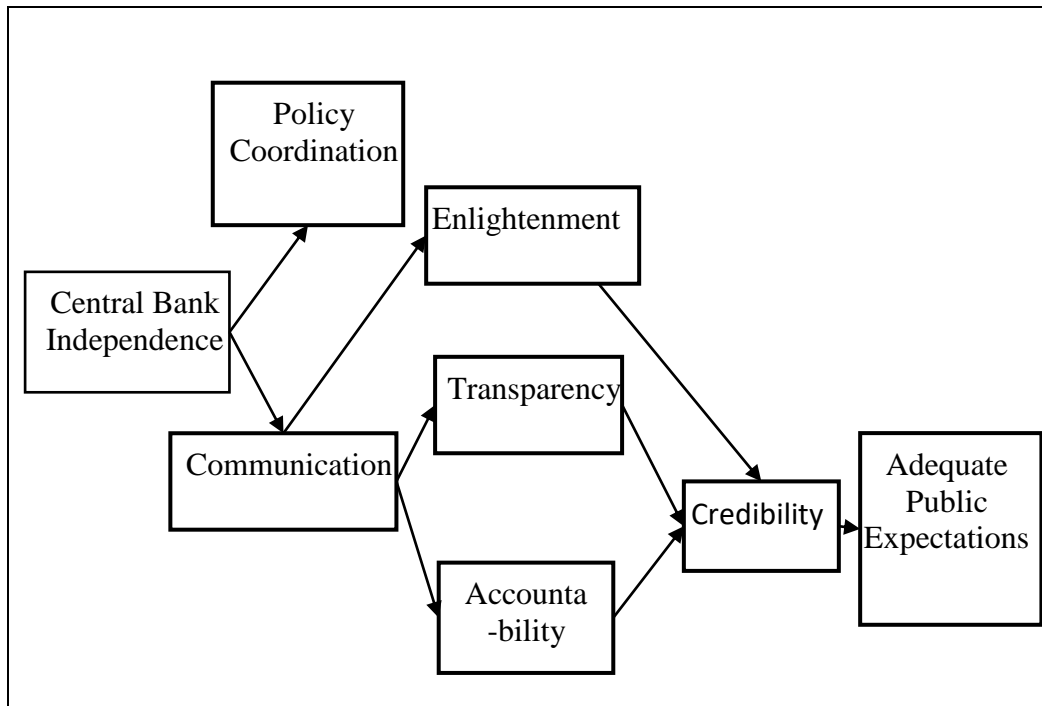
Figure 7: CBI and Policy Coordination between Monetary and Fiscal Authorities
Source: Adapted from Naghadiyev (2011).

Intuitively, a stronger policy coordination is expected to promote price stability and a sustainable economic growth (Andlib, *et al.,* 2012; Tarawalie *et al.,* 2013). The linkage is shown at the upper part of Figure 7. The lower part of Figure 7 illustrates the relationship between the CBI and CB communication strategy through to the public's inflation expectations. The operational independence of the CB demands transparency and accountability of the CB (Bernanke, 2010; Debelle & Fischer, 1995). The transparency and accountability depend on the effectiveness of communication strategy adopted by the CB. This is shown in the lower part of Figure 7.

It is worth noting that the CB communication objective is to shape and anchor the public's inflationary expectations in order to achieve price stability including financial stability with respect to its policy decisions (Naghadiyev, 2011). Effective communication is expected to help influence public's market expectations of future short-term rates, which in turn, influence long-term rates, inflation and output (Bawumia, 2010; Blinder *et al.*, 2008). This is possible when the public are well informed or enlightened about the CB policy decisions which require transparency and accountability. Hence, transparency and accountability serve as mediating variables to the final target of price stability through public's inflation expectations.

Finally, the possibility of the CB to adequately capture public's inflation expectation is tied to the credibility of the CB regarding its policy decisions. This is displayed by the link between transparency and accountability, and public's inflation expectations. In addition, to establish the role of CB communication strategy in influencing public's market expectations of future short-term rates, the study would shed light on factors

that account for weak monetary policy transmission mechanism in Ghana. The study concludes by identifying the major challenges facing monetary policy framework operated by Ghana which is not captured by the conceptual framework.

Selection of Study Participants

Creswell (2014) and Patton (1990) have argued that the participants for qualitative study should purposively be selected in order to help provide a better understanding of the problem and research questions to the researcher. This suggests a selection of participants who are rich in information for the study. Based on this argument, eight experts in monetary policy issues were purposively selected having in mind the purpose of the study. This comprises three academic staff (lecturers), two policy analysts, a chartered banker including one official each from the BoG and Ministry of Finance (MoF). The participants were selected based on their areas of specialisation, extent of knowledge in monetary policies and experiences. The profile of the participants is presented at Appendix B. The institutional profile of BoG has been captured under the overview of the WAMZ economies.

Moreover, eight participants were purposively selected for the study since there is no consensus as to what constitute the ideal sample size for qualitative study. Creswell (2014) suggested that the sample size depends on the qualitative design being used. Patton (2001, 1990), on the other hand, emphasised a careful selection of small number of participants who have in-depth information for qualitative enquiry. The participants selected for the study provide a fair representation of stakeholders with regard to the expert

views on performance of the CB on the conduct of monetary policy in Ghana. This will help get rich in-depth information for the qualitative study.

Data Collection Method and Instrumentation

The study employed in-depth interview to elicit the views and opinions of the experts on the conduct of monetary policy in Ghana. The motivation for using an in-depth interview is the desire to learn more from the experts on the issues related to the conduct of monetary policy in Ghana. In-depth interview provides more detailed and rich information compared to other qualitative data collection instruments in a more relaxed atmosphere. It also provides opportunity to ask follow-up questions in order to probe further for additional information.

The interview was conducted with the aid of an interview guide and digital voice recorder. The use of interview guide allows the interviewer to engage the participants regarding the issues specific to the topic under study within a predetermined framework and time (Patton, 2001). The interview guide was divided into five sections meant to address specific issues. Sections A and B comprise questions relating to operational independence of the CB and policy coordination. Section C focuses on communication strategy, transparency and accountability of CB. Sections D and E address issues relating to monetary transmission mechanism and challenges facing IT regime in Ghana. The participants were engaged to respond to an eleven-item question (Appendix Z).

Data Collection Procedure

The interview guide was pre-tested for further editing and the questions were fine-tuned for clarity. The instrument was pre-tested with

George Domfe (PhD), a Senior Research Fellow and a development economist at University of Ghana on 30th November, 2017. Prior to the collection of data, I sought permission from all the participants and scheduled an appointment on different dates for the in-depth interview. The interview began on 21st December, 2017 and ended on 1st February, 2018. Each participant was engaged for an average of 40 minutes. Permission was sought from the participants to record the in-depth interviews using digital voice recorder. I personally conducted all the interviews.

Data Analysis

The voice recordings of the participants were transcribed and edited. All the edited transcripts were imported into Nvivo 11 for windows for analysis. Moreover, codes were generated and organised into categories for analysis. The study used thematic framework for qualitative data analysis. This involves a detailed examination of the data set to find repeated patterns of meaning or themes (Braun & Clarke, 2006; Ruane & Wallace, 2013).

Domestic Debt and Price Level Determination in the WAMZ

Theoretical model

To estimate the effect of domestic debt on price level in the WAMZ, this study adapted the theoretical model used by Kwon *et al.* (2009), who investigated the effect of public debt on inflation in a sample of developed and developing countries. The model Kwon *et al.* (2009) used for their study is built on rational expectations, Cagan-type money demand, and a non-Ricardian regime that takes government bonds as net wealth. The theoretical model, which was also developed based on the FTPL, is considered appropriate for this study.

A functional relationship between price level and money, debt, including output or income is specified as follows:

$$p_{it} = \frac{M_{it} + \delta B_{it}}{\gamma(i)W}, \gamma(i) = \beta\left(\frac{1+i_{it}}{i_{it}}\right) + \alpha\delta, \qquad (13)$$

where P_{it}, M_{it}, B_{it} and W_{it} denote price level, money, debt, and real income (or wealth). α and β are functions of the structural parameters of the household's optimisation problem, i is the yield on debt, and δ is a portion of government debt that is not backed by the government's current and future primary surpluses. Drawing from Equation (13), a generalised price function can be specified as follows:

$P_{it} = (M_{it}, B_{it}, W_{it})$, where $f_1{>}0$, $f_2{>}0$ and $f_3{>}0$ \qquad (14)

Equation (14) establishes a positive relationship between price level and domestic debt as advanced by the FTPL which has been discussed under the theoretical literature. The FTPL argues that in an economy where fiscal policy dominates, the price level is determined by the level of public debt through an increase in aggregate demand resulting from a rise in nominal wealth of private agents (Kwon *et al.*, 2009; Woodford, 2001). Similarly, price level has a positive relationship with money supply and household's wealth or income.

Specification of empirical model

Following Kwon *et al.* (2009), Equation (14) is expanded to control for structural and cost-push factors of price level determination. The empirical model can be specified in a functional form as follows:

$$CPI_{it} = f(M2G_{it}, DD_{it}, GPC_{it}, NER_{it}, WFI_{it}) \qquad (15)$$

By transforming the functional form into a panel equation, we have

$$CPI_{it} = \beta_0 + \beta_1 M2G_{it} + \beta_2 DD_{it} + \beta_3 GPC_{it} + \beta_4 NER_{it} + \beta_5 WFI_{it} + \varepsilon_{it} \quad (16)$$

where CPI_{it} is the price level, $M2G_{it}$ is broad money supply growth, DD_{it} is domestic debt to GDP ratio, GPC_{it} is real per capita GDP at purchasing power parity, NER_{it} is nominal exchange rate, WFI_{it} is world food price index and ε_{it} is the error term. All the variables are logged except money supply growth and domestic debt to GDP ratio.

In order to evaluate the extent to which domestic debt, a proxy for fiscal dominance, compromises the conduct of monetary policy in the WAMZ in controlling price level, I introduced an interactive term between domestic debt and broad money supply growth. The inflationary effect of money supply conditioned of domestic debt is expressed as:

$$CPI_{it} = \beta_0 + \beta_1 M2G_{it} + \beta_2 DD_{it} + \beta_3 GPC_{it} + \beta_4 NER_{it} + \beta_5 WFI_{it} + \beta_6 (DD * M2G)_{it} + \varepsilon_{it} \qquad (17)$$

Measurement and Justification of Inclusion of Variables

This sub-section describes the measurement and justification of the variables used for the study. It also indicates the source of data and expected sign of the variables used for the study. Generally, the controlled variables were selected based on the review of the literature for the study. The study used quarterly panel data from 2001 to 2015 for the analysis.

Price level (CPI)

The price level is proxied by consumer price index. The consumer price index is the average cost of basket of goods and services over a specified period. The CPI gives an indication of the general price level. The price level is captured as monthly averages of logged consumer price index for each quarter following Harvey and Cushing (2014). The variable was sourced from IMF's IFS.

Real GDP per capita at PPP (GPC)

The real GDP per capita at purchasing power parity (PPP) gives an indication of the well-being or standard of living of the populace arising from the improvement and sophistication of the economy. Intuitively, an improvement in the well-being of the populace is expected to bid prices up at least in the short-term due to demand pressures. It is therefore expected that rising levels of real per capita GDP at PPP will induce an increase in price level. Real GDP per capita at PPP is measured as a ratio of GDP to the total population per purchasing power parity in US dollars. The real GDP per capita at PPP was interpolated into quarterly series using Denton (1971) data interpolation approach. The data for the variable was sourced from the World Bank's WDI.

Exchange rate (NER)

The exchange rate of a country is one of the main indicators of international competitiveness. Changes or variations in the exchange rate, be it depreciation or appreciation, more or less trigger flow of goods across borders. The nominal exchange rate is measured as the average quarterly bilateral local currency to the dollar. A deprecation of the exchange rate is expected to bid prices up. The data for the variable was taken from the IMF's IFS.

World food price index (WFI)

In developing countries like WAMZ member states, food inflation, mostly imported is one of the main drivers of headline inflation. The escalation in international food prices has profound and far-reaching implications for most countries around the world. The most significant are the

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escalating inflation, falling real consumption, especially, amongst the poorest segments of the world. The world food price index is measured as quarterly change in international prices of a basket of food commodities (2005=100). WFI is expected to have a positive effect on the domestic price level. The data was sourced from the database of the IMF' IFS.

Money supply (M2G)

One of the main indicators of the level of inflation in an economy is the rate of growth in money supply. The supply of money, which is one of the potent drivers of demand side policy is theorised to influence the level of prices positively. Money supply is measured as quarterly end of period growth of M2. The data was taken from the IMF's IFS.

Domestic debt (DD)

Theoretically, countries with rising levels of domestic debts tend to have high levels of inflation rates as predicted by the FTPL. It is believed that the wealth effect of government domestic debt arising from excessive deficit financing will put upward pressure on the general price level. It is expected that an increase in domestic debt will lead to an increase in demand for goods and services through wealth effect and cause an increase in price level in line with the FTPL. The domestic debt was captured as end of quarterly nominal domestic debt to nominal GDP ratio. The data for domestic debt was sourced from WAMI.

Estimation Procedure

Panel unit root test

To test whether long-run association exists between inflation and the independent variables, the study employed Im, Pesaran and Shin (IPS) (2003)

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and the Maddala and Wu (1999) fisher-type (ADF-Fisher Chi-square and PP-Fisher Chi-square) panel unit root tests. MW fisher-type test is non-parametric and it is based on the combination of the *p*-values of the test-statistic for a unit root in each cross-sectional unit. Let π_i be the p-value from the *i*th-test such that $\propto_i$ are $u(0,1)$ and independent, and $-2\log_e \pi_i$ has a X^2 distribution with 2 degrees of freedom. That is, MW statistic is given by $p = -2\sum_{i=1}^{N} \log_e \pi_i$ and has a X^2 distribution with *2N* degrees of freedom, where *N* is the number of separate samples.

The IPS test on the other hand is parametric and it is based on averaging individual Augmented Dickey-Fuller unit root tests. The ADF regression for IPS is specified as:

$$\Delta y_{it} = \alpha_i + \rho_i y_{i,t\ 1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{i,t\ j} + \varepsilon_{it} \text{ , where } t = 1,2,...,T \quad (18)$$

The average of the t-statistics for p_1 from the individual ADF regressions, $t_{iT_i}(p_i)$, can be expressed as:

$$\bar{t}_{NT} = \frac{1}{N}\sum_{i=1}^{N} t_{iT}(p_i \beta_i) \quad (19)$$

The null hypothesis for IPS is that all individuals follow a unit root process. The alternative hypothesis states that not all individuals follow a unit root process.

Panel cointegration tests

The study employed Kao (1999) residual-based and Johansen Fisher panel cointegration tests due Maddala and Wu (1999) to test for cointegration among the variables. Kao (1999) uses both DF and ADF to test for cointegration in panel. This test is similar to the standard approach adopted in

the EG-step procedures. Also, this test starts with the panel regression model as set out in Equation (20).

$$Y_{it} = X_{it}\beta_{it} + Z_{it}\gamma_0 + \varepsilon_{it} \tag{20}$$

Where Y_{it} and X_{it} are presumed to be non-stationary

$$\hat{\varepsilon}_{it} = \rho\hat{\varepsilon}_{it} + V_{it} \tag{21}$$

where $\hat{\varepsilon}_{it} = (Y_{it} - X_{it}\hat{\beta}_{it} + Z_{it}\hat{\gamma}_0)$ are the residuals from estimating Equation (20). To test the null hypothesis of no cointegration amounts to testing $H_0: \rho = 1$ in Equation (21) against the alternative that Y_{it} and X_{it} are cointegrated (i.e. $H_1: \rho < 1$). Kao's (1999) DF-Type test statistics and ADF test statistics are presented as:

$$DF_\rho = \frac{\sqrt{NT}(\hat{\rho}-1) + \sqrt[3]{N}}{\sqrt{51/5}}, \tag{22}$$

$$DF_t = \sqrt{\frac{5t_\rho}{4} + \frac{15N}{8}}, \tag{23}$$

$$DF_\rho^* = \frac{\sqrt{NT}(\hat{\rho}-1) + \frac{\sqrt[3]{N\hat{\sigma}_v^2}}{\hat{\sigma}_{0v}^2}}{\sqrt{3 + \frac{36\hat{\sigma}_v^4}{5\hat{\sigma}_{0v}^4}}}, \tag{24}$$

$$DF_t^* = \frac{t_\rho + \frac{\sqrt{6N}\hat{\sigma}_v}{2N\hat{\sigma}_{0v}}}{\sqrt{\frac{\hat{\sigma}_{0v}^2}{2\hat{\sigma}_v^2} + \frac{3\hat{\sigma}_v^2}{10\hat{\sigma}_{0v}^2}}} \tag{25}$$

$$ADF = \frac{t_{ADF} + \frac{\sqrt{6N}\hat{\sigma}_v}{2N\hat{\sigma}_{0v}}}{\sqrt{\frac{\hat{\sigma}_{0v}^2}{2\hat{\sigma}_v^2} + \frac{3\hat{\sigma}_v^2}{10\hat{\sigma}_{0v}^2}}} \tag{26}$$

where:

N   -   cross-section data

T   -   Time series data

$\hat{\rho}$ -   co-efficiencies of D

$$t_\rho \quad - \quad \left[(\hat{\rho} - 1) \sqrt{\left(\sum_{i=1}^{N} \sum_{t=2}^{T} \hat{e}^{*\,2}_{i,t-1} \right)} \right] \Big/ Se$$

$$Se \quad - \quad (1/NT) \sum_{i=1}^{N} \sum_{t=2}^{T} (\hat{e}^*_{it} \hat{\rho} \hat{e}^*_{i,t-1})^2$$

$\hat{\sigma}_u^2$ -   variance of u

$\hat{\sigma}_v^2$ -   variance of v

$\hat{\sigma}_u$ -   standard deviation of u

$\hat{\sigma}_v$ -   standard deviation of v

$$t_{ADF} \quad - \quad \left[(\hat{p} - 1) \sum_{i=1}^{N} (e' Q_i e_i)^{1/2} \right] \Big/ S_V$$

On the other hand, Maddala and Wu (1999) proposed an alternative approach to testing for cointegration in panel data by combining tests from individual cross-sections to obtain test statistics for the full panel. If Π_i is the p-value from an individual cointegration test for cross-section i, then under the null hypothesis for the panel,

$$2 \sum_{i=1}^{n} \log \Pi_i \to \chi^2 \; 2n \tag{27}$$

By default, the χ^2 value is based on MacKinnon-Haug-Michelis (1999) P-value used for Johansen's cointegration trace test and maximum eigenvalue test. The Johansen's Maximum likelihood procedure is specified as:

$$\Delta Y_{i,j} = \Pi_i y_{i,t-1} + \sum_{k=1}^{n} T_k \Delta Y_{i,t-k} + \mu_{i,t} \tag{28}$$

$$H_0: rank(\Pi_i) = r_i \leq r \; for \; all \; i \; from \; 1 \; to \; n$$

$$H_a: rank(\Pi_i) = P \; for \; all \; i \; from \; 1 \; to \; n$$

The standard rank test statistics is defined in terms of average of the trace statistic for each cross-section unit and mean and variance of traces statistics.

The Fully-Modified OLS (FMOLS) and Dynamic OLS (DOLS)

Estimators

I present the FMOLS and DOLS methodologies as proposed by Kao and Chiang (2000) to estimate the long-run cointegration vector, for non-stationary panels. These estimators correct the standard pooled OLS for serial correlation and endogeneity of regressors that are normally present in long-run relationship. I start FMOLS procedure with the following fixed effect panel regression:

$$y_{it} = \alpha_i + x_{it}'\beta + \mu_{it}, \ i = 1,...,N; t = 1,...,T \tag{29}$$

where $y{it}$ is a matrix $(1,1)$, β is a vector of slopes $(k,1)$ dimension, α_i is individual fixed effect, u_{it} are the stationary disturbance terms. It is assumed that $\alpha_i(k,1)$ vectors are integrated processes of order one for all i, where:

$$x_{it} = x_{it-1} + \varepsilon_{it} \tag{30}$$

Under these specifications, Equation (29) describes a system of cointegrated regressions, i.e. y_{it} is cointegrated with x_{it}. By examining the limiting distribution of the FMOLS and DOLS estimators in co-integrated regressions, Kao and Chiang (2000) showed that they are asymptotically normal. The FMOLS estimator is constructed by making corrections for endogeneity and serial correlation to the OLS estimator and is defined as:

$$\widehat{\beta}_{FM} = \left[\sum_{i=1}^{N}\sum_{t=1}^{T}(x_{it} - \bar{x}_i)'\right]^{-1}\left[\sum_{i=1}^{N}\left(\sum_{t=1}^{T}(x_{it} - \bar{x}_i)\widehat{y}_{it}^{+} + T\widehat{\Delta}_{\varepsilon\mu}^{+}\right)\right] \tag{31}$$

where $\Delta_{\varepsilon\mu}^{+}$ the serial correlation correction term and y_{it}^{+} is the transformation of y_{it} to achieve the endogeneity correction. The serial correlation and the endogeneity can also be rectified by using DOLS estimator. The DOLS is an extension of Stock and Watson's (1993) estimator.

To obtain an unbiased estimator of the long-run parameters, DOLS estimator uses parametric modification to the errors by incorporating the past and the future values of the differenced I(1) regressors. The dynamic OLS estimator is obtained from the following equation:

$$y_{it} = \alpha_i + x'_{it}\beta + \sum_{j=q_1}^{j-q_2} c_{ij}\Delta x_{i,t+j} + V_{it}$$

(32)

where c_{ij} is the coefficient of a lead or lag of first differenced explanatory variables. The estimated coefficient of DOLS is given by:

$$\hat{\beta}_{DOLS} = \sum_{i=1}^{N}\left(\sum_{t=1}^{T} Z_{it}Z'_{it}\right)^{-1}\left(\sum_{t=1}^{T} Z_{it}\hat{y}_{it}^{+}\right)$$

(33)

Where $Z_{it} = \left[x_{it} - \bar{x}_i\,,\, \Delta x_{i,t-q},\, \Delta x_{i,t+q}\right]$ is $2(q+1) \times 1$ vector of regressors. A Study by Kao and Chiang (2000) showed that estimates by DOLS are more efficient than the FMOLS. As a result, DOLS estimates were considered as a robustness check for the results obtained from FMOLS estimations.

Diagnostic tests

To test for possible endogeneity problems and collinearity among the variables, the study employed the coefficient variance decomposition to determine further sources of endogeneity and correct them in the models following Adom, Zumah, Mubarik, Ntodi and Darko (2014), and Belsley, Kuh and Welsch (2005). According to Besley *et al.* (2005) any two or more regressors with the eigenvalues of more than 50 per cent provide evidence of potential collinearity problems among the variables. When that happens one of the variables has to be dropped to avoid collinearity.

Conclusion

Chapter Four discussed the research methods employed for the study. The study adopted quantitative and qualitative research designs in line with

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the objectives of the study. Two research philosophies, positivism and interpretivism, were adopted for both quantitative and qualitative data analyses. The chapter also presented the various theoretical and empirical models of the quantitative analysis including the conceptual framework for the qualitative study. Also, the dataset used for the study were described.

CHAPTER FIVE

EMPIRICAL INVESTIGATION OF MONETARY POLICY

TRANSMISSION MECHANISM IN THE WEST AFRICAN

MONETARY ZONE

Introduction

Chapter Five is divided into two parts. The summary statistics of the variables used for the study and the unit root test results are presented in part one. The second part is devoted to the discussion of SVAR results on channels of monetary policy transmission in five WAMZ member states. The discussion on the country-specific channels of monetary transmission excludes Guinea due to unavailability of monthly data on credit to private sector while that of the panel SVAR focuses on the four monetary targeting regime countries comprising Nigeria, The Gambia, Sierra Leone and Guinea.

Summary Statistics of Variables used for the Study

The descriptive statistics largely centred on the location and variability of the data. Table 1 indicates that all the variables for both country-specific analyses and panel have positive average values. Majority of the variables used for country-specific analyses show greater variability in their distribution. For WAMZ, the average real GDP per capita (GDP) stood at US$79074.64 with a standard deviation of US$140344.3 suggesting the unstable nature of the zone's economic performance. The consumer price index (CPI) averaged 84.1 over the study period and ranged from 23.9 to 177.1 which implies that largely, inflation has been moderately high.

Table 1: Summary Statistics

Country	Variable	Obs	Mean	Std. Dev.	Max.	Min.
Ghana	CEA**	152	227.38	91.19	399.25	103.08
	P	152	15.26	5.24	31.1	8.29
	LR	152	28.37	3.66	38.5	24.25
	PC*	152	5781.83	5514.4	21371.5	507.2
	NER*	152	1.35	0.59	3.20	0.78
	PR	152	17.00	3.92	27.5	12.5
Nigeria	GDP*	168	3863570	1142172	5737763	2039714
	CPI	168	82.59	34.79	150.93	32.02
	LR	168	20.59	2.99	29.33	16.41
	PC*	168	5467779	4037168	12643231	620995.9
	NER*	168	137.47	15.98	169.68	110.01
	M0*	168	1649424	1366599	5964758	398021.9
The Gambia	GDP*	168	1588.85	218.98	1930.62	1256.73
	CPI	168	88.94	20.11	126.57	52.68
	LR	168	28.57	3.72	36.5	24
	PC*	168	2906.83	1656.17	5988.54	555.92
	NER*	168	27.98	6.44	44.97	14.80
	M0*	168	2823.1	1347.5	6021.3	722.66
Sierra Leone	GDP*	168	546042.2	174276.1	929406.4	274629.8
	CPI	168	83.61	38.45	160.65	38.62
	LR	168	26.1	1.93	31	22.19
	PC*	168	445794.1	376960	1046687	26574.39
	NER*	168	3276.16	861.13	4947.54	1653.39
	M0*	168	498273.4	362474	1524179	106434.7
WAMZ	GDP ($)	224	79074.64	140344.3	457667.4	664.47
	CPI	224	84.09	37.13	177.11	23.93
	LR	224	23.09	3.96	34.5	14.88
	PC ($)	224	9418.06	20548.29	75519.71	13.97
	NER	224	0.012	0.017	0.07	0.00014
	M0 ($)	224	3100.59	6489.41	35152.98	40.51

Note: * indicates variables measured in local currencies of member countries,
   ** denotes real composite index of economic activity, a proxy for GDP.
Source: Author (2018).

Also, the mean lending rate (LR) recorded in the zone is 23.1 per cent which is quite high. The average amount of credit (PC) supplied to the zone's private sector amounted to US$9418.06 with a standard deviation of US$20548.29 which shows a greater variability. Moreover, the reserve money (M0) recorded a mean score of US$3100.59 with a standard deviation of

US$6489.41. The average US dollar exchanged per local currency is 0.012 with a standard deviation of 0.017.

Results of Stationarity Tests

The Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) tests were employed to determine stationarity properties of the series for country-specific study while the ADF-Fisher Chi-square and PP-Fisher Chi-square unit root tests were used to test for the stationarity of the panel series. The stationarity tests show that all the variables used for the study, both country-specific and panel, are non-stationary at levels, but become stationary after first difference. The ADF and PP unit root tests for country-specific study, and ADF and PP panel unit root tests for the panel study are displayed in Appendices C to G.

SVAR Lag Length Selection Criteria

The optimal lag lengths for both the country-specific SVAR and panel SVAR were chosen based on the results of the VAR lag order selection criteria. The study chose optimal lag of 3 in estimating the IRFs and FEVD for the individual country and 7 lags for panel analyses. Specifically, the AIC, LR test statistic and FPE selected 3 lags while SC and HQ selected 1 lag and 2 lags respectively in the case of Ghana. For Nigeria, AIC, FPE and HQ selected 3 lags, but SC and LR test statistic indicated lags 2 and 7. With regard to The Gambia, all the four VAR lag order selection criteria, with the exception of LR test statistic, indicated lag 3. Concerning Sierra Leone, AIC and FPE selected 4 lags while SC and HQ selected 3 lags. In the case of the panel study, AIC, LR test statistic and FPE selected 7 lags, but SC and HQ

indicated 3 lags. Details of the lag length order selection criteria for the study are presented in Appendices H to L.

Analyses of Channels of Monetary Policy Transmission

This section discusses the SVAR results on channels of monetary transmission for country-specific and panel studies using impulse response functions and forecast error variance decomposition. It begins with the analysis of IRFs and concludes with the FEVD. The study analyses the estimated impulse response functions of the dynamic responses of endogenous variables to a structural one-standard-deviation monetary policy shock over a 36-month period within the SVAR system. The solid lines show the estimated effects while the dashed lines represent the 95 per cent confidence interval. If the confidence interval for impulse responses includes zero, it implies monetary policy has no statistical significant effect on non-policy variables, price level and real output. The analyses begin with Ghana and end with the panel SVAR of the WAMZ.

Channels of Monetary Transmission in Ghana

Responses of Macroeconomic Variables to Monetary Policy Shocks

Economic theory postulates that a contractionary monetary policy through an increase in the CB's official interest rate or reduction in money supply should lead to an increase in the short-term interest rate, a fall in credit to private sector, demand for money, price level and output while the exchange rate would appreciate. Figure 8 depicts the IRFs of macroeconomic variables comprising lending rate, credit to private sector, exchange rate, price level and real output to monetary policy shocks.

An unanticipated increase in policy rate results in an instantaneous significant increase in lending rate from 1.7 per cent in the second month to a peak of about 60 per cent in the thirteenth month as shown in panel B of Figure 8. The rapid pass-through of monetary policy shock to lending rate is not surprising since DMBs in Ghana tend to respond timely to increases in policy rate by adjusting their lending rates upwards. This result is similar to the finding of Centre for Policy Analysis (2012) for Ghana. On the contrary, lending rate is sticky downwards in response to a decrease in monetary policy
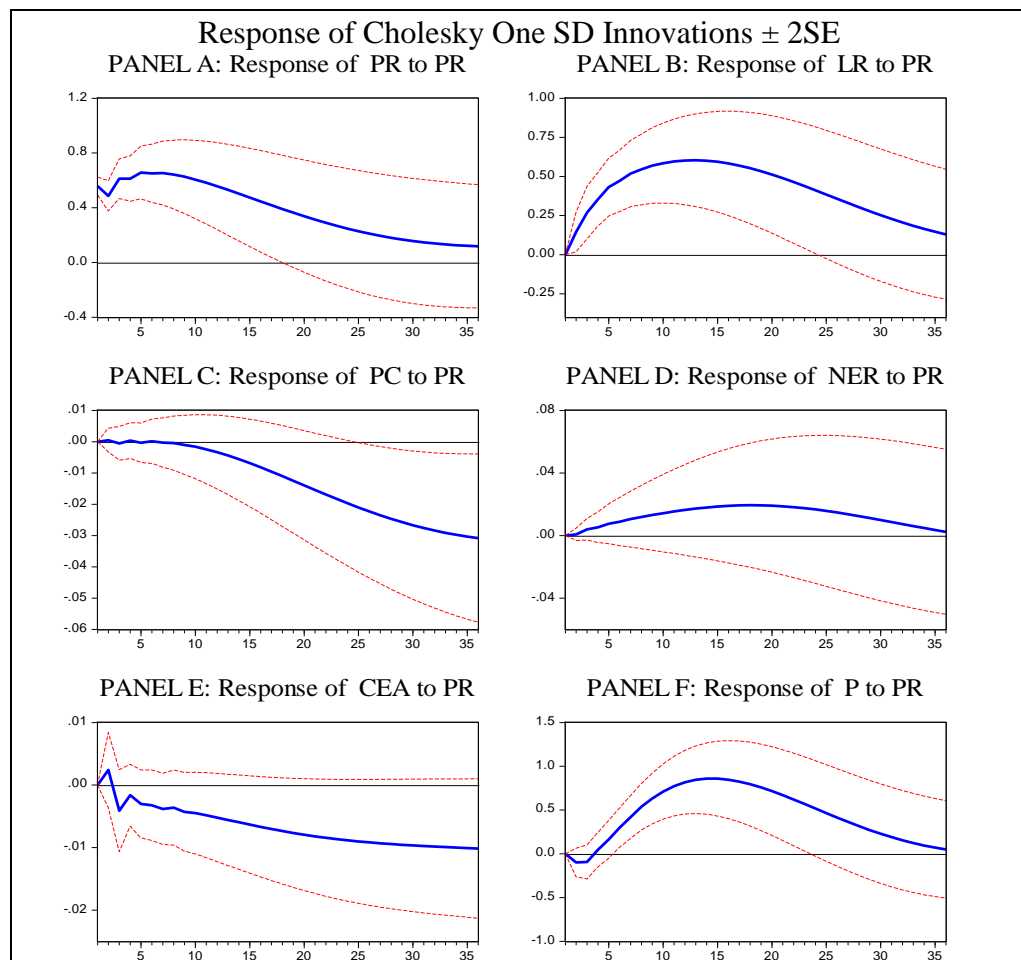
Figure 8: IRFs of Macroeconomic Variables to Monetary Policy Shocks
Source: Author (2018).

rate. This has been attributed to long-term institutional and public deposits locked up in fixed deposits with DMBs, high levels of bad loans and high cost of capital including operational cost of the DMBs.

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On the other hand, credit to private sector is insensitive to a positive innovation in monetary policy in the first nine months, but responds negatively after the tenth month. This is significant between twenty-sixth and thirtieth months averaging 26 per cent as indicated in panel C of Figure 8. The delay in response of credit to monetary policy innovation may be explained a number of factors. It is possible that the DMBs are able to secure additional source of funding outside the CB for lending. It may also be attributed to excess reserves in the banking system that slow down the effect of restrictive monetary policy on credit supply.

Contrary to economic theory, a positive monetary policy shock causes a depreciation of the local currency, the Cedi, against the US dollar. This persisted for about twenty-four months although insignificant as indicated in panel D of Figure 8. The insensitivity of the exchange rate to monetary policy shocks may be attributed partly to the apparent low development of the financial structures in Ghana to allow free mobility of portfolio capital into the economy in response to interest rate hikes. This result corroborates the findings by Abradu-Otoo *et al*. (2003) for Ghana Ghana but inconsistent with the results reported by Mordi and Amoo (2014) for Nigeria, and Ogunkola and Tarawalie (2008) for Sierra Leone.

Furthermore, panel E reveals that real economic activity responds insignificantly to monetary policy shocks by rising immediately in the second month to about 0.2 per cent before falling below the baseline. This persisted for over two years after which it returned to equilibrium. This result seems to suggest that monetary policy is neutral in the short-run. Also, it may partly be attributed to the low financial structure development. The insignificant effect

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of monetary policy shock on real output is in contrast to the findings of Mallick and Sousa (2011) for BRICS, but in consonance with studies by Davoodi *et al*. (2013) for Kenya and Abradu-Otoo *et al*. (2003) for Ghana.

Moreover, an unexpected monetary policy shock resulted in a temporary insignificant fall in inflation within the second and third months, but a significant and persistent rise in inflation after the fourth month. The possible explanation is that policy rate hikes limit investment and economic growth, and consequently increase production costs as a result of high cost of borrowing which is later transferred into high prices of goods and services. Also, the increase in inflation rate may be attributed to public expectations about future inflationary pressure in the economy. This finding is similar to the evidence provided by Javid and Munir (2010) for Pakistan and Abradu-Otoo *et al.* (2003) for Ghana.

Responses of Real Output and Inflation to Interest Rate Shocks

The responses of real output and inflation to shocks in interest rate are presented in panels A and D of Figure 9. Panel A of Figure 9 shows that innovation in lending rate causes a sharp spike in real output within three months and thereafter stabilises, resulting in output puzzle. This result is inconsistent with economic theory and evidence provided by Mugume (2011) for Uganda, but confirms results of Davoodi *et al*. (2013) for Kenya and Abradu-Otoo *et al*. (2003) for Ghana. On the other hand, a shock to lending rate has a contemporaneous dampening effect on inflation which persisted for about a year as displayed in panel D. Its significance is evident between the third and thirteenth months peaking at 43 per cent. This appears to suggest that restrictive monetary policy through interest rate is effective in reducing

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domestic prices in tandem with the inflation targeting framework adopted by Ghana. This result supports a study by Kyereboah-Coleman (2012) which shows that adoption of inflation targeting framework in Ghana has significantly reduced inflation and inflation persistence.
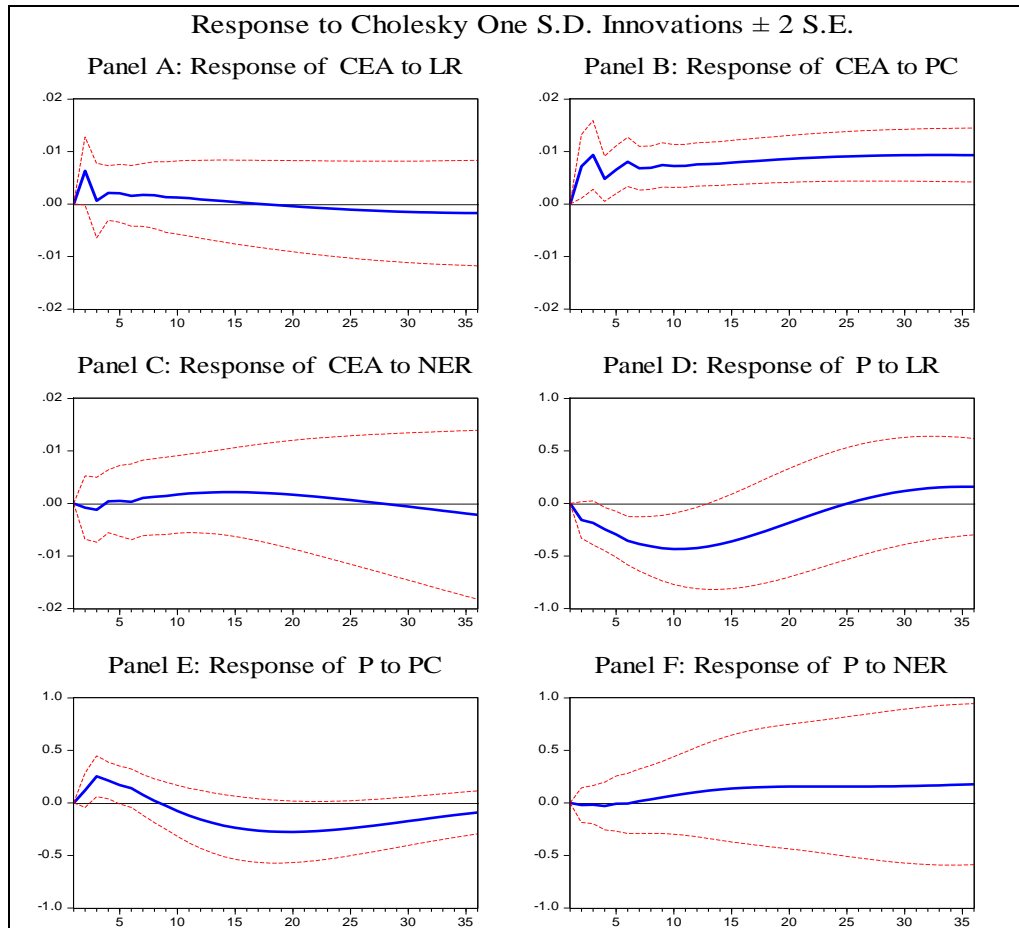
Figure 9: IRFs of Non-policy Variables to shocks to Financial Variables
Source: Author (2018).

Responses of Real Output and Inflation to Credit Shocks

With regard to the bank lending channel, the results of IRFs show that real output and inflation increase in response to innovations in credit to private sector. For example, a positive shock to credit induces a significant instantaneous increase in real economic activity within the first three months peaking at 0.93 per cent. This persisted for over two years just after a minimal tumbling in the fourth month as shown in panel B of Figure 9. The result

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suggests that increase in private sector credit drives production of goods and services in Ghana. Hence, to stimulate real output growth, more emphasis should be placed on bank lending channel while removing all structural bottlenecks that inhibit access to credit by the private sector in Ghana. The result confirms economic theory and the findings Mbutor (2009) for Nigeria, Ogunkola and Tarawalie (2008) for Sierra Leone, and Abradu-Otoo *et al*. (2003) for Ghana.

Similarly, inflation increases immediately in response to credit shock, peaking at 25 per cent in the third month but died out quickly as showed in panel E. This is significant between the second and fourth months. This implies that credit to private sector drives prices of commodities as it increases money supply. This finding corroborates the results of Mugume (2011) for Uganda and Ogunkola and Tarawalie (2008) for Sierra Leone, but in contrast to that of Abradu-Otoo *et al.* (2003) for Ghana.

Responses of Real Output and Inflation to Exchange Rate Shocks

In the case of the exchange rate channel, the results suggest that shocks to exchange rate have positive effect on real output and inflation as indicated in panels C and F, respectively. For instance, panel C of Figure 9 shows that a shock to exchange rate has an insignificant, marginal positive effect on real economic activity between eighth and twenty-second months. This implies that depreciation of the Cedi against the US dollar is not significant in boosting exports and real economic activity in Ghana. This may partly be attributed to high costs of imports which serve as the main inputs for production. This evidence corroborates the results of Abradu-Otoo *et al*.

(2003) for Ghana but in contrast with that of Adenekan and Ahortoh (2013) for Nigeria.

Similarly, panel F reveals that an innovation in exchange rate causes an insignificant persistent rise in inflation after the eighth month, consistent with economic theory. The insignificant effect of exchange rate shock to inflation is partly attributable to the fact that Ghana operates managed exchange rate policy and the CB's intervention in the foreign exchange market may undermine the exchange rate channel.

Variance Decomposition of Real Economic Activity and Inflation

The forecast error variance decomposition provides information about the relative importance of each random innovation in affecting the variables in the SVAR. The FEVD for the horizons 3, 6, 12, 18, and 24 are reported in Tables 2 and 3. The first and second columns in each sub-table show the periods and forecast error of the variable for each forecast horizon. The remaining columns present the percentage of the variance due to each shock, with each row adding up to 100.

Table 2 indicates that apart from shocks to itself, innovations in credit to private sector and policy rate are the most important variables that explain fluctuations in real output within the short to medium term. For example, over the forecast period, a shock to real activity explained about 60 per cent of its own variations while shocks to private sector credit and monetary policy accounted for about 24 and 14 per cent in the medium term.

Table 2: Variance Decomposition of Real Economic Activity

Period	S. E.	CEA	P	LR	PC	NER	PR
3	0.043	88.84	0.06	2.19	7.56	0.11	1.23
6	0.052	86.11	0.15	1.91	10.05	0.10	1.67
12	0.617	77.98	0.39	1.64	15.28	0.47	4.24
18	0.069	68.81	0.37	1.31	19.96	0.91	8.63
24	0.077	59.67	0.33	1.11	23.97	0.94	13.97

Source: Author (2018).

On the other hand, a greater fluctuation in inflation in the medium term is accounted for mainly by shocks to policy rate as presented in Table 3. For instance, while about 80 per cent of the variation in inflation is explained by its own innovation within six months, shocks to policy rate explained 55 per cent within a twenty-four-month forecast horizon compared to 21 per cent attributable to shocks to inflation over the same forecast period. This means that monetary policy rate plays significant role in stabilising inflation in Ghana in tandem with inflation targeting framework operated by Ghana.

Table 3: Variance Decomposition of Inflation

Period	S. E.	CEA	P	LR	PC	NER	PR
3	1.436	0.58	91.79	2.88	3.82	0.04	0.89
6	1.904	1.78	80.44	9.17	4.76	0.05	3.80
12	2.867	3.83	42.46	16.84	2.73	0.4	33.77
18	3.698	2.56	25.70	15.34	4.17	1.05	51.17
24	4.157	3.49	21.14	12.85	5.79	1.67	55.06

Source: Author (2018).

Channels of Monetary Transmission in Nigeria

Responses of Macroeconomic Variables to Monetary Policy Shocks

Figure 10 shows the impulse responses of real output, price level and financial variables to structural one-standard deviation shocks to monetary policy, base money. In contrast to economic theory, a shock to base money causes a sustained contemporaneous increase in lending rate in the first three months after which it returns steadily to equilibrium as shown in panel B. The possible explanation for this liquidity puzzle is that money supply may increase passively as a result of expansionary fiscal policy rather than expansionary monetary policy. Besides, the CBN since 2007 uses monetary policy rate to signal monetary authority's stance. Perhaps the monetary authority tends to increase the policy rate in order to control a possible rise in the price level caused by expansionary fiscal policy.

In a similar manner, credit to private sector rather falls instantly in the second and third months before returning to equilibrium though insignificant as indicated in panel C. This inconsistent result may partly be explained by an apparent increase in policy rate to control a possible inflationary pressure resulting from fiscal expansion as explained earlier.

Moreover, an unanticipated expansion in the monetary base resulted in instantaneous insignificant, but persistent depreciation of the domestic currency, the Naira, against US dollar as depicted in panel D. The result is consistent with economic theory. The insignificant response of exchange rate depreciation suggests that expansion in monetary base may not be the main factor that drives depreciation of the naira in Nigeria. It is possible that other

factors including dollarisation and parallel exchange rate market may influence movement in the exchange rate.
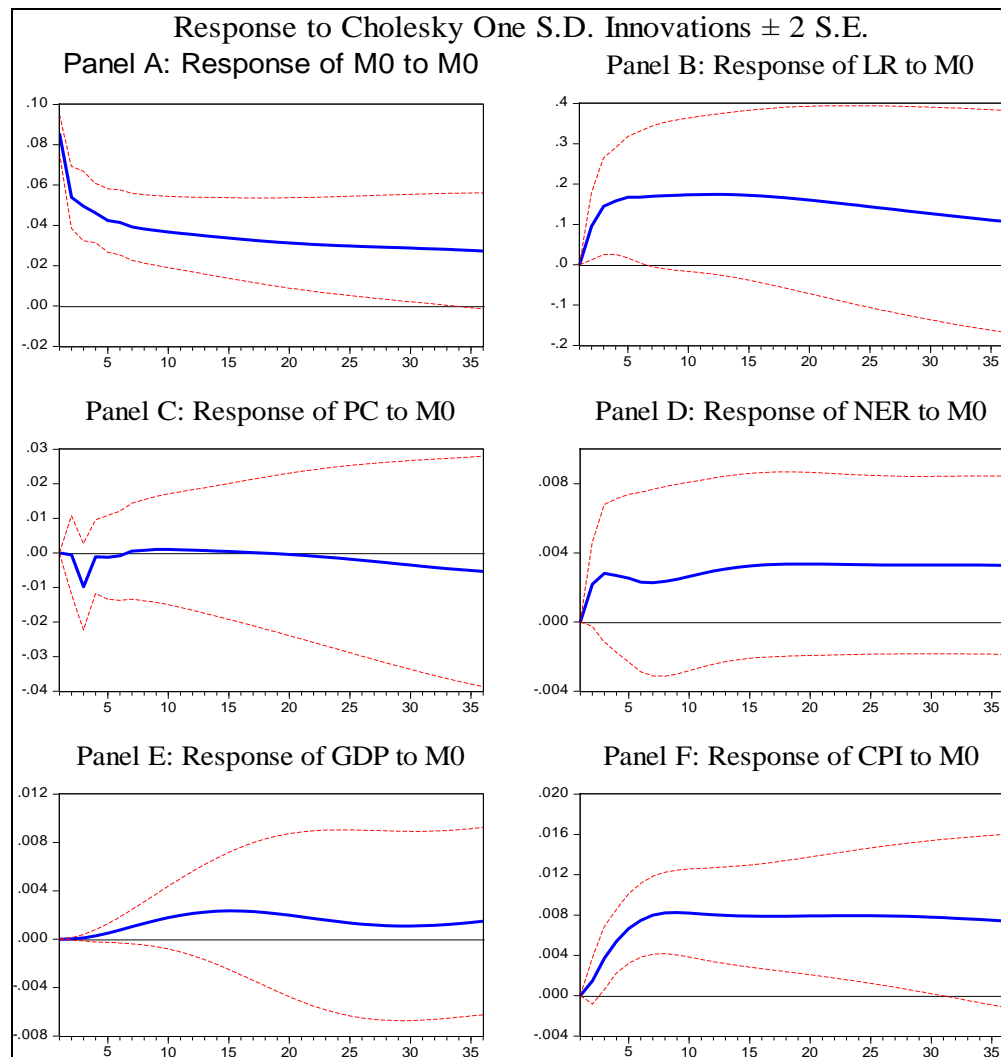
Figure 10: IRFs of Non-policy and Financial Variables to Monetary Policy Shocks
Source: Author (2018).

Furthermore, panel E indicates that an unanticipated expansion in the monetary base leads to an insignificant increase in real GDP. Real GDP responds to an innovation in monetary base after the first three months peaking at about 0.23 per cent in the fourteenth months after which it returns to equilibrium. This result confirms the findings of Adenekan and Ahortor (2013) for Nigeria. On the other hand, panel F shows that price level increases instantaneously and significantly to a shock to monetary base in the second

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month peaking at 0.82 per cent in the eighth month. This persisted though declining imperceptibly for over twenty-four months. This result is similar to the findings of Adenekan and Ahortor (2013), and Chuku (2009) for Nigeria.

Responses of Real Output and Price Level to Interest Rate Shocks

The responses of real output and price level to interest shocks are presented in panel A and D of Figure 11. Panel A shows that a shock to lending rate leads to a decline in real output from the fourth month. It is significant between the sixth and nineteenth months, peaking at 1.5 per cent. The implication is that a reduction in lending rates boosts production in Nigeria even though unanticipated increase in base money does not lead to a decrease in lending rate. This result is consistent with theory but in sharp contrast with the results reported by Adenekan and Ahortor (2013) for Nigeria and Montiel (2013) for Uganda. On the contrary, a shock to lending rate has insignificant dampening effect on price level as displayed in panel D. This result is similar to the findings of Adenekan and Ahortor (2013), and Chuku (2009) for Nigeria.

Responses of Real Output and Price Level to Credit Shocks

Panels B and E of Figure 11 depict the responses of real output and price level to shocks in credit to private sector. Panel B of reveals that real GDP increases contemporaneously in response to an unanticipated increase in credit to a peak of 0.50 per cent in the nineteenth month before fizzling out. This is significant between the seventh and eighteenth months. The implication is that increase in credit to private sector promotes production in Nigeria even though credit to private sector is insensitive to innovation in monetary base. The result is in consonance with economic theory, but

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inconsistent with the findings of Adenekan and Ahortor (2013) and Ogun and

Akinlo (2010) for Nigeria.
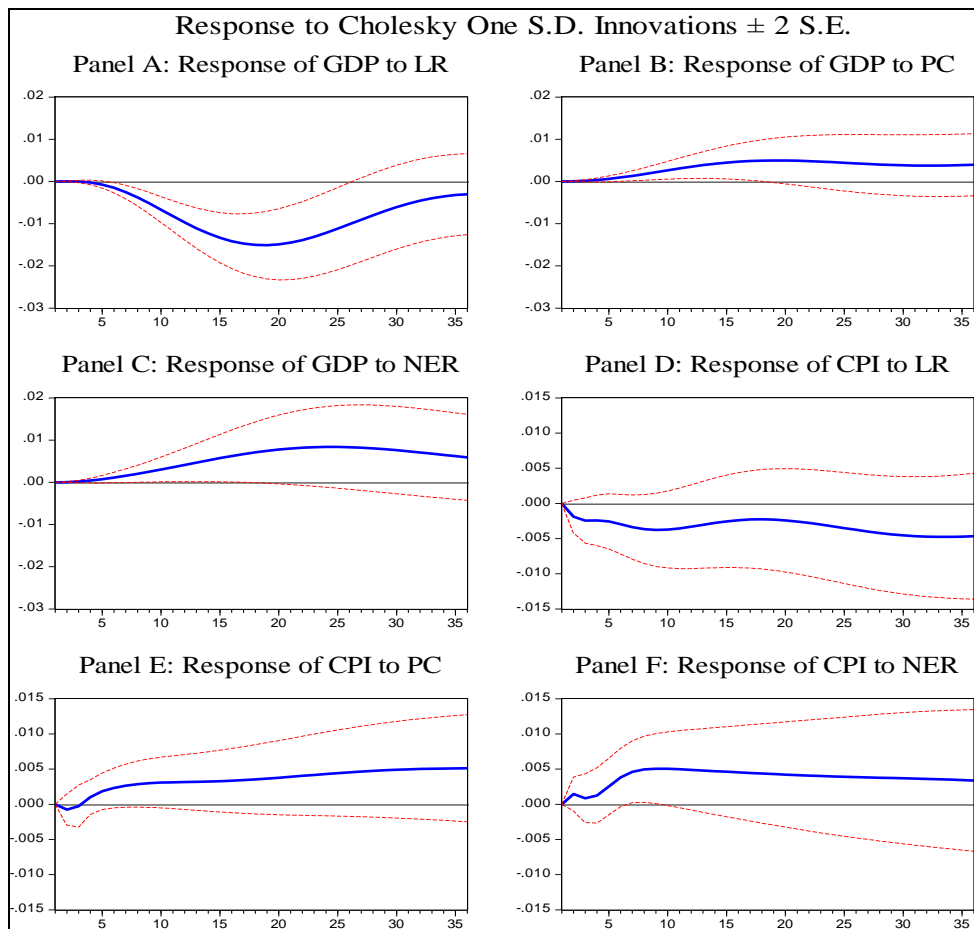
Figure 11: IRFs of Non-policy Variables to Shocks to Financial Variables
Source: Author (2018).

Price level, on the other hand, declines marginally in response to

innovations in credit before rising persistently after the third month above the

baseline. This rises to about 0.51 per cent over a thirty-six month forecast

period. The shock to credit appears to have no significant effect on price level

even though one would expect that an increase in credit would increase broad

money supply and invariable price level.

Responses of Real Output and Price Level to Exchange Rate Shocks

Concerning the exchange rate channel of monetary transmission, the

results of the IRFs show that unexpected shocks to exchange rate have

positive effect on both real output and price level. As displayed in panel C of Figure 11, real GDP rises in response to innovation in nominal exchange rate after the third month peaking in twenty-fourth month at 0.84 per cent. This is significant between the fifth and the eighteenth months. The implication is that depreciation of the Naira against US dollar boost competitiveness of Nigerian exports and increases real output. This result confirms economic theory, but in contrast with the empirical evidence reported by Adenekan and Ahortor (2013) for Nigeria.

Furthermore, price level increases persistently from the second month to 0.5 per cent in the tenth month before declining gradually to the baseline. Its significance is evident between the seventh and tenth months. This suggests exchange rate pass-through from imported inflation to the domestic economy. This evidence is also consistent with economic theory and corroborates the finding of Aliyu and Englama (2009) for Nigeria. The above findings for real output and price level provide evidence of effectiveness of exchange rate channel in Nigeria.

Forecast Error Variance Decomposition of Real Output and Price Level

Tables 4 and 5 display the FEVD of the endogenous variables. The results show that real GDP explains about 56.7 per cent of its own fluctuation within twelve months but 19 per cent over the forecast period. Shocks to lending rate and nominal exchange rate account for 30 per cent and 6.2 per cent fluctuations in real GDP within a year, but both variables explain a greater variability in real GDP amounting to 71.7 per cent over a twenty-four month forecast horizon. Nonetheless, innovations in lending rate explain almost 60 per cent in the medium term. The results suggest that shock to

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lending rate is the most important factor explaining fluctuations in real GDP in the medium term.

Table 4: Variance Decomposition of Real Output

Periods	S. E.	GDP	CPI	LR	PC	NER	M0
3	0.003	99.19	0.059	0.01	0.29	0.32	0.13
6	0.010	92.34	0.32	2.91	1.47	2.01	0.95
12	0.029	56.77	0.75	29.57	4.64	6.22	2.06
18	0.051	29.88	0.73	51.13	6.18	10.21	1.86
24	0.067	19.12	0.70	56.94	6.85	14.84	1.55

Source: Author (2018).

With regard to fluctuations in price level, about 89 per cent is explained by its own innovation within the first three months. However, over the twenty-four months period, the effect of monetary policy shocks to price level becomes stronger as it explains about 35.4 per cent compared to 21.9 per cent variations attributable to shocks to the three financial variables with exchange rate accounting for 10.9 per cent. The implication is that increase in money supply is key in influencing inflation in Nigeria confirming the monetarists' view that inflation is a monetary phenomenon.

Table 5: Variance Decomposition of Price Level

Period	S. E.	GDP	CPI	LR	PC	NER	M0
3	0.024	5.49	89.43	1.67	0.11	0.50	2.80
6	0.032	10.07	68.90	3.04	1.04	2.51	14.44
12	0.044	7.82	46.23	5.56	3.32	8.89	28.17
18	0.053	7.61	38.35	5.30	4.75	10.77	33.22
24	0.060	8.69	33.56	5.23	6.19	10.92	35.41

Source: Author (2018).

Channels of Monetary Transmission in The Gambia

Impulse Responses of Macroeconomic Variables to Monetary Policy

Shocks

The responses of financial and non-policy variables to innovation in base money are shown in Figure 12. A positive shock to base money induces an instant decline in lending rate from the second month to about 17 per cent in the sixth month though not significant as shown in panel B. This is consistent with economic theory and similar to the findings of Adenekan and Ahortor (2013) for Nigeria and Montiel (2013) for Uganda, but inconsistent with the evidence provided by Touray (2013) for The Gambia. Moreover, innovation in base money has insignificant effect on private sector credit as it increases contemporaneously, but temporally within the first three months before declining to 0.5 per cent in the seventh month. It later inches up to the base line as displayed in panel C.

Exchange rate, on the other hand, responds in a manner inconsistent with economic theory and finding of Touray for The Gambia, though insignificant. Panel D reveals that instead of depreciating in response to innovation in base money, the domestic currency, Dalasi, appreciated against the US dollar. The implication is that increase in base money appears to have no influence on exchange rate movement in The Gambia; other factors such as a boost in tourism may account for the appreciation of the Dalasi.

Furthermore, real output initially falls moderately for about eleven months before rising above the base line as indicated in panel E. This means that increase in base money rather has a passive and insignificant effect on real output. Perhaps the increase in money supply may be due to expansionary

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fiscal policy other than a deliberate monetary policy aimed at stimulating output growth. This result is inconsistent with the classical economic theory even though similar to the findings of Adenekan and Ahortor (2013) for Nigeria.
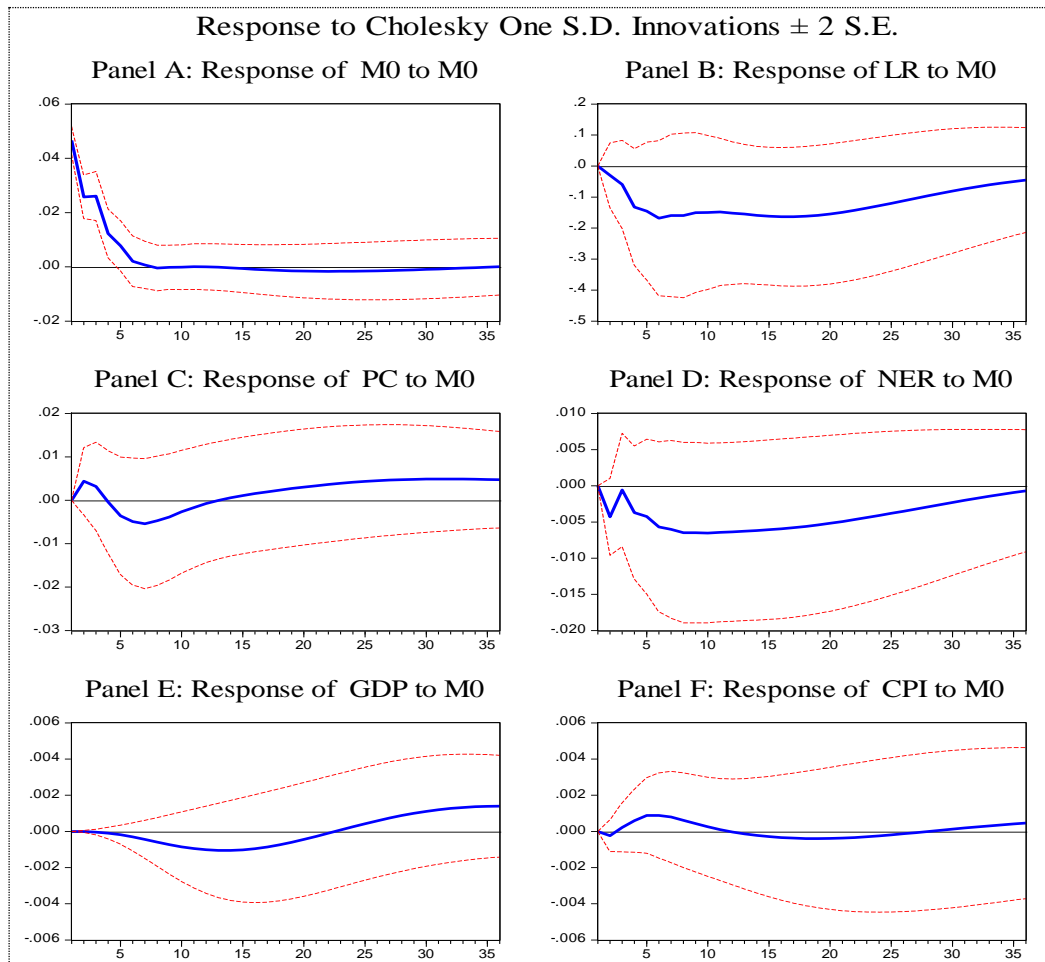
Figure 12: IRFs of Non-policy Variables to Shocks to Financial Variables
Source: Author (2018).

With regard to the price level, panel F shows that a structural one-standard deviation in base money induces an insignificant moderate increase in price level peaking at the sixth month after which it returns to equilibrium. The result appears to suggest that inflation is not a monetary phenomenon in contrast to the findings of Tarawalie *et al.* (2012) for The Gambia. This result corroborates the findings of Touray (2013) for The Gambia and Davoodi *et al*. (2013) for Rwanda.

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Responses of Real Output and Price Level to Interest Rate Shocks

Panels A and D of Figure 13 show the responses of real output and price level to shocks to lending rate. As displayed in panel A, real GDP declines after twelve months though insignificant in response to a shock to lending rate. This suggests that interest rate channel is ineffective in stimulating real economic activity in The Gambia contrary to expectation. This result confirms the finding of Touray (2013) for The Gambia. Moreover, a shock to lending rate as indicated in panel D induces a contemporaneous insignificant marginal increase in price level for about twelve months before falling consistently over the next fifteen months. This evidence indicates that
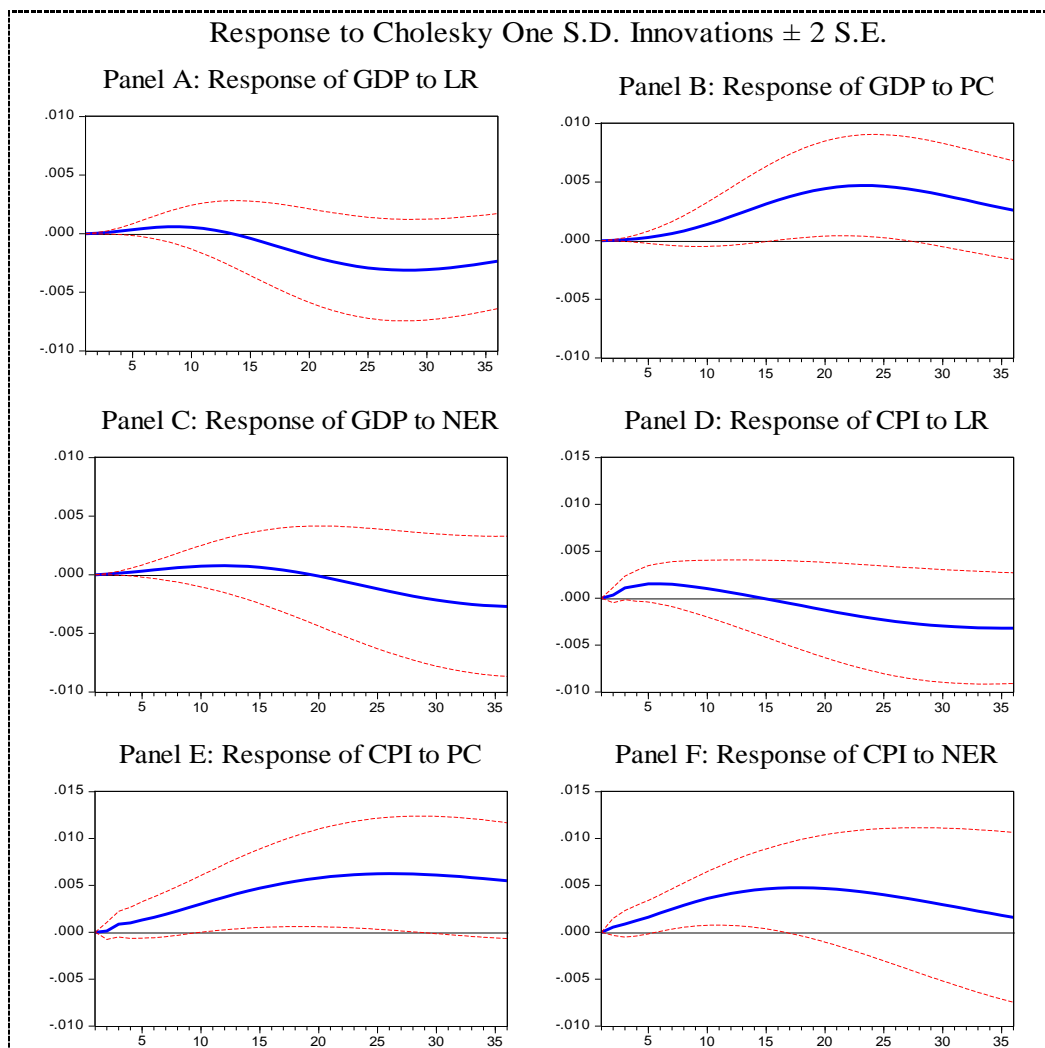
Figure 13: IRFs of Non-policy Variables to shocks to Financial Variables
Source: Author (2018).

lending rate channel is weak in driving price level in The Gambia. In sum, the results provide evidence of weak interest rate channel in transmitting monetary impulses to real sector in The Gambia. This is partly explained by the shallow financial system.

Responses of Real Output and Price Level to Credit Rate Shocks

The effects of innovations in credit on real output and price level are presented in panels B and E of Figure 13. The results show that credit shocks have positive effect on both real output and price level. For instance, consistent with economic theory, panel B reveals that a shock to credit to private sector results in an increase in real GDP after nine months peaking at twenty-four months before returning to equilibrium. This is significant between fifteenth and twenty-seventh months. This result suggests that credit to private sector is effective in driving real output in The Gambian economy. The result confirms the findings of Mbutor (2009) for Nigeria, but in contrast with evidence provided by Mugume (2011) for Uganda.

Moreover, price level increases consistently from the second month up to twenty-ninth month to about 0.62 per cent following the shock to credit. The increase in price level becomes significant after nine months to twenty-ninth month as displayed in panel E. This suggests that expansion in credit to private sector is effective in driving domestic prices even though credit is not impacted significantly by increase in base money. The result is consistent with the findings of Mugume (2011) for Uganda. This implies that DMBs in The Gambia have the potential to play a more important role in the transmission of monetary policy through bank lending channel. The CBG can boost real output and stabilise inflation by paying more attention to bank lending

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channel. Therefore, the CBG should endeavour to remove all bottlenecks that slow down the effectiveness of bank lending channel.

Responses of Real Output and Price Level to Exchange Rate Shocks

Concerning the exchange rate channel, the results reveal that innovations in exchange rate have no significant effect on real output, but a significant effect on price level. Panel C of Figure 13 shows that a shock to exchange rate causes an insignificant marginal increase in real GDP after three months which is consistent with economic theory, but a steady decline after nineteen months. The implication is that depreciation of the Dalasi against the US dollar is not significant in impacting real output in The Gambia compared to that of Nigeria.

On the contrary, a shock to exchange rate has a significant positive effect on price level as it increases from the second month persistently to a peak of 0.48 per cent in the eighteenth month after which it dies out. The significance of the increase in price level becomes evident between sixth and sixteenth months as indicated in panel F. This result suggests exchange rate pass-through to domestic prices following the depreciation of the Dalasi in The Gambia. This evidence is consistent with economic theory and the results of Touray (2013) for The Gambia.

Forecast Error Variance Decomposition of Real Output and Price Level

The FEVD of the endogenous variables in the SVAR system are reported in Tables 6 and 7. The FEVD indicates that fluctuations in real output are explained mainly by its own shocks and shocks to price level and credit to private sector over the short to medium term. For instance, shock to real GDP explains about 96 per cent of its own variation in the second quarter and 58.5

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per cent over the twenty-four months period. Shocks to private sector credit account for about 17 per cent variation in real output compared to 20 per cent explained by the shock to price level over the forecast period. This reinforces the importance of credit channel in explaining real output movement in The Gambia.

Table 6: Variance Decomposition of Real Output

Period	S. E.	GDP	CPI	LR	PC	NER	M0
3	0.002	98.696	0.269	0.350	0.203	0.443	0.038
6	0.007	95.875	1.582	0.842	0.659	0.735	0.306
12	0.019	87.890	6.366	0.547	3.246	0.867	1.082
18	0.024	74.494	13.524	0.655	9.549	0.627	1.151
24	0.035	58.456	20.216	3.029	16.873	0.588	0.837

Source: Author (2018).

Moreover, fluctuations in price level are explained mainly by its own shock, shocks to credit to private sector and nominal exchange rate over the medium term. Shocks to price level explain about 78.4 per cent of its own fluctuations within twelve months and 61.2 per cent over the forecast horizon while shocks to credit to private sector and exchange rate account for 19.2 per cent and 15.7 per cent, respectively. This means that shocks to credit and exchange rate play important role in determining price level in The Gambia.

Table 7: Variance Decomposition of Price Level

Period	S. E	GDP	Price	LR	PC	NER	M0
3	0.011	0.035	97.422	1.010	0.602	0.848	0.082
6	0.017	0.025	91.556	2.573	2.022	3.154	0.670
12	0.027	0.4811	78.378	2.077	7.731	10.886	0.447
18	0.037	1.321	67.585	1.206	14.390	15.217	0.281
24	0.046	1.630	61.196	1.570	19.621	15.764	0.218

Source: Author (2018).

Channels of Monetary Transmission in Sierra Leone

Impulse Responses of Macroeconomic Variables to Monetary Policy

Shocks

The impulse responses of macroeconomic variables to a structural one-standard innovation to base money are shown in Figure 14. A cursory look at panel B indicates that lending rate takes rather a longer period to fall following a shock to base money which is counter-intuitive. It initially rises insignificantly from the second month and decreases after fifteen months. The delay in the fall of lending rate to a shock to base money coupled with the presence of liquidity puzzle may be due perhaps to an increase in the policy rate to control inflationary pressure resulting from the unexpected increase in base money. This result is similar to the findings of Montiel *et al.* (2012) for Tanzania.
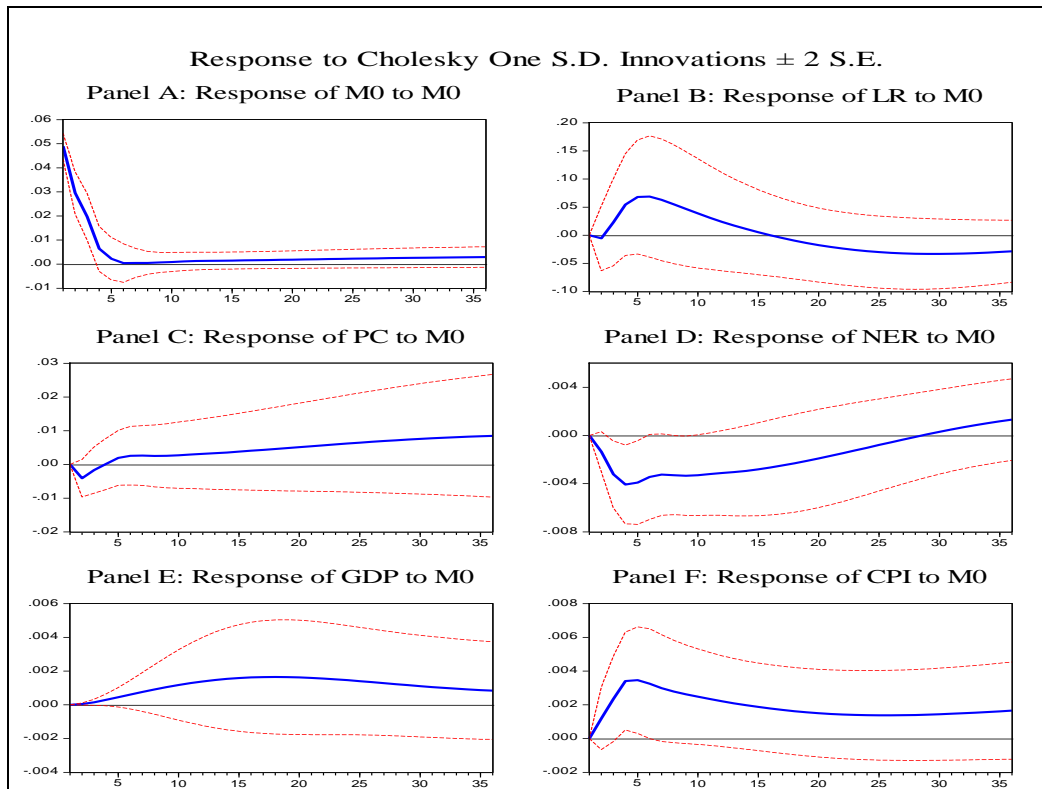
Figure 14: IRFs of Non-policy and Financial Variables to Monetary Policy
Source: Author (2018).

Moreover, credit to private sector declines immediately within the first two months in response to unanticipated increase in base money and thereafter increases insignificantly above the baseline as depicted in panel C. This appears to suggest that increase in base money does not have significant effect on credit to private sector. Hence, credit to private sector may be influenced by other factors including the monetary policy rate, which is now being used by the CB to signal monetary policy stance in Sierra Leone.

In contrast, panel D reveals that exchange rate appreciated significantly in the fourth month before rising above the baseline after twenty-eight months. This finding is inconsistent with economic theory. The results seem to suggest that expansion in base money does no cause depreciation of the Sierra Leonean Leone against the US dollar which is counter-intuitive.

Furthermore, innovations in base money have positive effect on real output and price level. Real output increases marginally after three months and declines after twenty-two months to the baseline. This is not significant, but consistent with economic theory. Price level, on the other hand, increases contemporaneously within the first month peaking at fourth and fifth months significantly after which it fizzles out. This confirms monetarists' view of price level determination and the findings of Adenekan and Ahortor (2013), and Chuku (2009) for Nigeria. The results are presented in panels E and F, respectively.

Responses of Real Output and Price Level to Interest Rate Shocks

The responses of real output and price level to innovations in financial variables are displayed in Figure 15. With regard to interest channel, the IRFs show that innovations in lending rate have insignificant dampening effects on real output and price level. For instance, real output declines steadily after first three months in response to a shock to lending rate though insignificant as displayed in panel A. This is consistent with economic theory and empirical findings provided by Mishra *et al.* (2014) for low-income countries where lending rate channel was found to be weak due to low development of the financial sector.
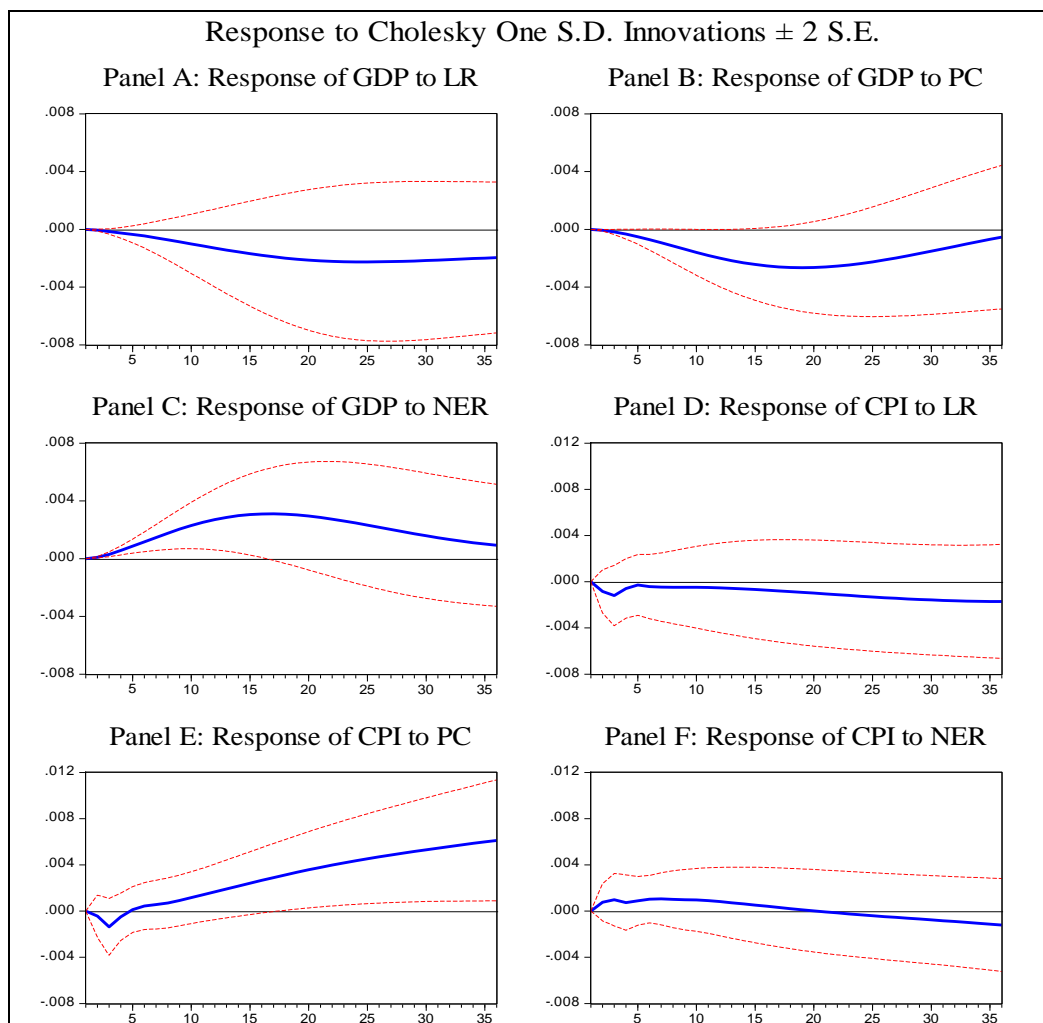
Figure 15: IRFs of Non-policy Variables to shocks to Financial Variables
Source: Author (2018).

Similarly, price level declines instantaneously but insignificant following a shock to lending rate as shown in panel D. This also confirms economic theory and the finding of Ogunkola and Tarawalie (2008) for Sierra Leone where shocks to lending rate had no significant effect on both price level and real output. This is an indication of weak interest rate channel due perhaps to the shallowness and underdeveloped financial sector.

Responses of Real Output and Price Level to Credit Shocks

In the case of bank lending channel, panel B of Figure 15 reveals that, contrary to expectation, real GDP falls in response to a shock to credit to private sector although insignificant. This result is contrary to the empirical evidence found by Ogunkola and Tarawalie (2008) for Sierra Leone. This appears to suggest that credit channel is weak in driving real output; other factors may be responsible for movement in output in Sierra Leone. On the other hand, a shock to private sector credit causes a rise in price level after second quarter despite the initial marginal fall. The significant effect of credit to private sector on price level is noticeable after seventeen months as depicted in panel E. This seems to suggest that private sector credit drives demand for goods and not production in Sierra Leone. This result confirms that of Ogunkola and Tarawalie (2008) for Sierra Leone.

Responses of Real Output and Price Level to Exchange Rate Shocks

In response to a shock to exchange, real output increases significantly in the fourth month but died out after eighteen months as shown in panel C of Figure 15. This appears to suggest that depreciation of the Sierra Leonean Leone against the US dollar promotes exports and increases output. This result contradicts the findings of Ogunkola and Tarawalie (2008) for Sierra Leone.

In addition, an innovation in exchange rate leads to a rise in price level almost immediately in the first month to about 0.11 per cent in the seventh month before falling. The positive effect of exchange rate depreciation on price level is not significant. This may partly be attributed to monetary authority's intervention in the foreign exchange market that limits complete exchange rate pass-through to price level in Sierra Leone. This result corroborates the findings of Mugume (2011) for Uganda. This is shown in panel F of Figure 15.

Forecast Error Variance Decomposition of Real Output and Price Level

The results of the FEVD as indicated in Table 8 show that shocks to real GDP explains a greater proportion of itself in the first and second quarters as it accounts for about 91 per cent and 85 per cent, respectively, with 13 per cent explained by shocks to the financial variables. Over the twenty-four months period, real output shock explains 68.8 per cent of its own variations while shocks to price level and exchange rate account for 10.7 per cent and 8.7 per cent, respectively.

Table 8: Variance Decomposition of Real Output

Periods	S.E.	GDP	CPI	LR	PC	NER	MO
3	0.00	95.91	0.07	0.59	0.82	2.09	0.52
6	0.01	91.19	0.12	0.81	1.77	4.81	1.30
12	0.02	85.26	1.24	1.37	3.34	6.96	1.84
18	0.03	77.95	4.62	2.29	4.82	8.12	2.20
24	0.04	68.79	10.72	3.46	5.89	8.66	2.48

Source: Author (2018).

Similarly, Table 9 indicates that fluctuations in price level is explained mainly by its own shock in the short to medium term as it accounted for about 79 per cent over the entire forecast horizon. However, shocks to credit to

private sector and base money explain just 9.3 per cent and 7.6 per cent, respectively.

Table 9: Variance Decomposition Price Level

Periods	S.E.	GDP	CPI	LR	PC	NER	M0
3	0.02	0.51	95.81	0.62	0.60	0.45	2.01
6	0.02	0.84	90.70	0.46	0.42	0.66	6.91
12	0.03	0.69	88.57	0.43	1.05	0.97	8.30
18	0.04	1.70	84.90	0.57	3.93	0.86	8.04
24	0.04	2.51	78.90	0.95	9.30	0.74	7.59

Source: Author (2018).

Panel Analysis of Channels of Monetary Transmission in WAMZ Countries

Figure 16 shows the IRFs of financial and non-policy variables to shocks to monetary base. With the exception of lending rate and price level, innovations in monetary base have counter-intuitive effects on nominal exchange rate and credit to private sector contrary to expectation. For instance, an expansion in monetary base causes a significant instant fall in lending rate reaching a minimum of 21 per cent in the first quarter after which it jumps in the seventh quarter and returns to equilibrium. This is depicted in panel B. This result is in consonance with economic theory and confirms the findings of Montiel (2013) for Uganda.

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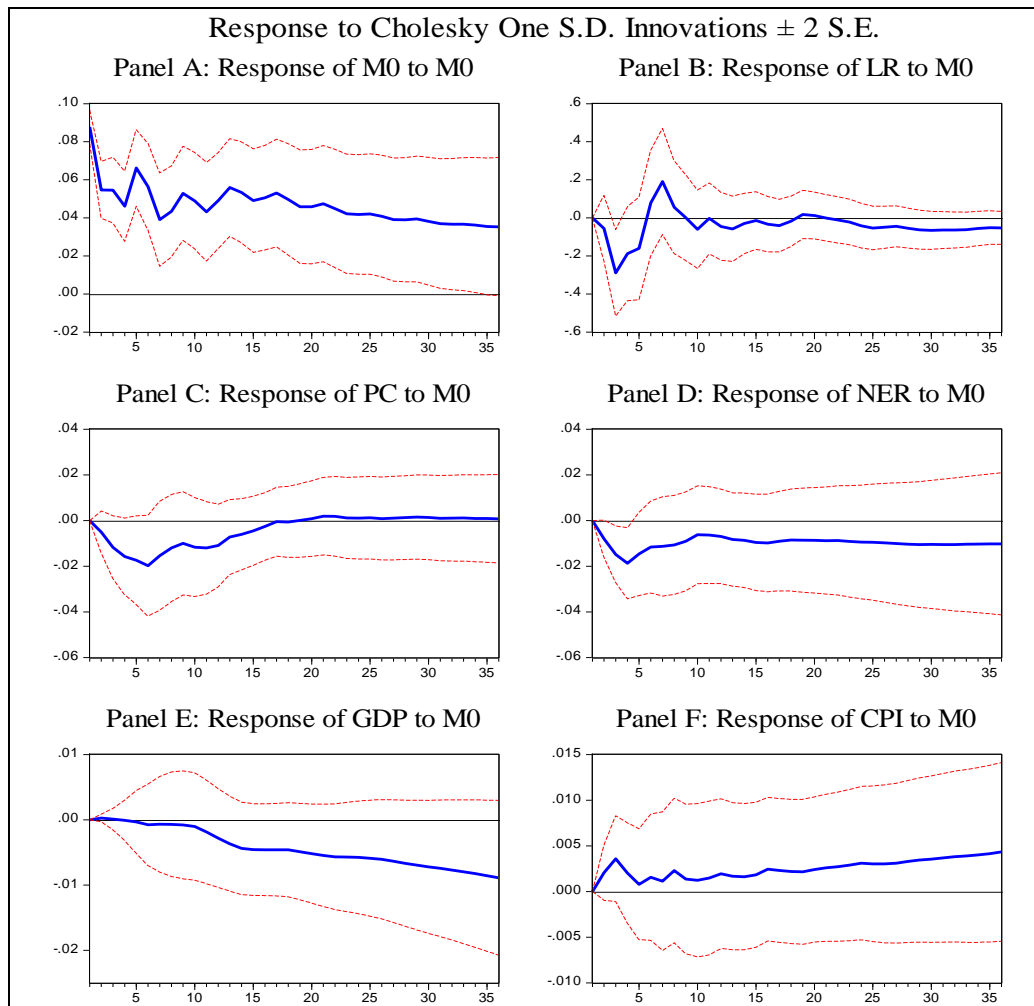
Figure 16: IRFs of Non-policy Variables to shocks to Financial Variables
Source: Author (2018).

Moreover, Panel E of Figure 16 shows that real output rather declines in response to a shock to base money in a manner contrary to economic theory. This may be attributed to a passive increase in money supply resulting from expansionary fiscal spending rather than deliberate monetary policy operation geared towards boosting productive economic activity. In contrast, the effect of innovation in base money on price level is positive and confirms economic theory although insignificant. The instant increase in price level peaks at 0.36 per cent in the third quarter before falling in the fifth quarter as displayed in panel F.

Responses of Real Output and Price Level to Interest Rate Shocks

The responses of real output and price level to innovations in financial variables are showed in Figure 17. Panel A and D show that shocks to lending rate has expected effect on real output and price level consistent with economic theory. Innovation in lending rate causes a fall in real output over third to eight quarters before rising to equilibrium above the baseline. Although unexpected increase in lending rate has a dampening effect on real output it is not significant perhaps due to low level of development of the financial structure in the zone. Similarly, a lending rate shock has insignificant effect on price level in the first 14 months. The results confirm weak interest rate channel in the WAMZ member states.
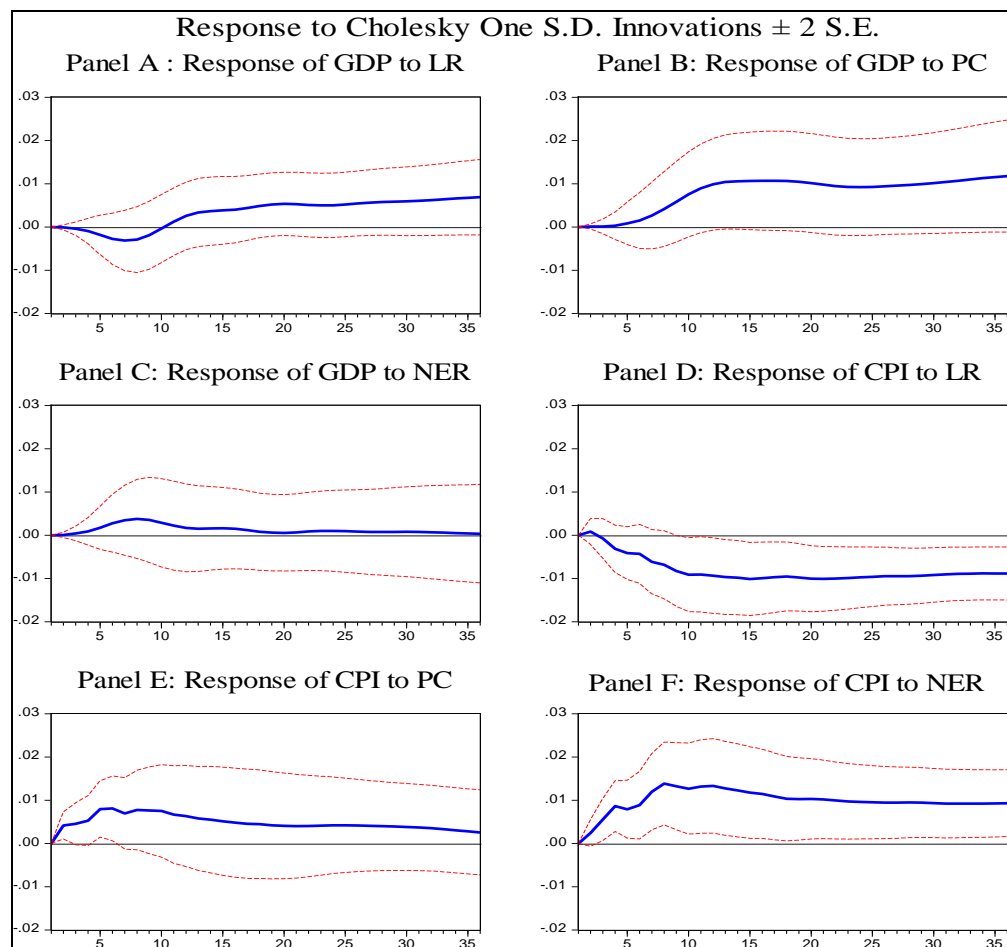
Figure 17: IRFs of Non-policy Variables to shocks to Financial Variables
Source: Author (2018).

Responses of Real Output and Price Level to Credit Shocks

With regard to bank lending channel, the IRFs show that real out and price level responded positively to an unanticipated increase in credit to private sector. However, the effect of innovation in credit to private sector on real output is felt after five quarters as it increases consistently throughout the forecast period as displayed in panel B. This is almost significant between fourteenth and fifteenth quarters. In contrast, a shock to private sector credit has a significant positive effect on price level between the second and sixth quarters peaking at 0.8 per cent in the sixth quarter. This is shown in panel E.

Responses of Real Output and Price Level to Exchange Rate Shocks

Similar to the bank lending channel of monetary transmission, shocks to exchange rate also have expected effects on real output and price level as depicted in panels C and F of Figure 17. For instance, innovations in exchange rate has no significant effect on real output even though it increases marginally before dying out after eight quarters. The insignificance of the result is an indication that currency depreciation does not boost exports and real output due possibly to increase in prices of imported inputs used in production process in the WAMZ member states.

In contrast, innovation in exchange rate has a significant effect on price level as it increases immediately in the first quarter to about 1.45 per cent in the eighth quarter before returning to equilibrium as shown in panel F. This suggests that, unlike real output, exchange rate depreciation has a strong pass-through to inflation within the WAMZ countries.

Forecast Error Variance Decomposition of Real Output and Price Level

A cursory look at Table 10 indicates that fluctuations in real output are explained mainly by its own shock over a ten-quarter forecast horizon. For instance, a shock to real GDP explains about 97 per cent of its own variations over the ten-quarter forecast period while the financial variables account for 0.71 per cent with base money explaining just 0.93 per cent. This reinforces the impulse responses discussed earlier and suggests that other variables rather explain greater movement in real output for the proposed WAMZ economy.

Table 10: Variance Decomposition of Real Output

Period	S.E.	GDP	CPI	LR	PC	NER	M0
2	0.015	99.85	0.09	0.01	0.02	0.04	0.00
6	0.058	99.36	0.31	0.00	0.04	0.12	0.18
8	0.070	98.88	0.37	0.01	0.13	0.15	0.47
10	0.078	97.91	0.44	0.05	0.45	0.21	0.93

Source: Author (2018).

Similarly, variation in price level is explained mainly by its own shocks as presented in Table 11. For instance, shocks to price level account for 80.3 per cent of its own fluctuations over the entire forecast horizon while changes in credit to private sector and exchange rate explain 14.14 per cent within short to medium term.

Table 11: Variance Decomposition of Price level

Period	S.E.	GDP	CPI	LR	PC	NER	M0
2	0.034	0.06	98.03	0.37	1.08	0.36	0.09
6	0.063	1.61	88.22	0.35	5.32	4.12	0.38
8	0.074	2.71	83.98	0.61	7.41	4.85	0.44
10	0.083	3.68	80.33	1.29	8.83	5.31	0.56

Source: Author (2018).

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Post Estimation Tests (LM and Stability Condition Tests)

The residuals of the SVAR were tested for autocorrelation and stability condition of the model. The LM tests for both the country-specific and panel analyses suggest that the residuals are not serially correlated. Moreover, the models passed stability tests indicating that the IRFs return to their long-run equilibrium. Appendix M shows the results of the LM tests for both the country-specific and panel studies. Appendices N to R, on the other hand, present the results of the stability condition tests.

Conclusion

The results of the IRFs and FEVD for monetary targeting WAMZ member states revealed that, generally, innovations in base money as monetary policy had no effects on the financial variables suggesting a weak transmission of monetary impulses to the financial sector. However, it had a stronger significant impact on price level for all the countries except The Gambia. In the case of Ghana, changes in monetary policy rate had a significant and persistent effect on lending rate indicating a strong pass-through from policy rate changes to lending rate and a protracted effect on private sector credit. The study found that channels of monetary transmission differ across the WAMZ countries with credit channel being effective in Ghana and the Gambia, and moderate exchange rate channel in Nigeria. Interest rate channel remains weak in the zone due to a number of factors including low financial structure development. The results found evidence of a strong exchange rate pass-through to price level in a panel of the WAMZ monetary targeting economies.

CHAPTER SIX

THE CONDUCT OF MONETARY POLICY IN GHANA: THE

EXPERTS' OPINION

Introduction

Chapter Six explores the perceptions of experts including officials of BoG and MoF in assessing performance of the CB in the conduct of monetary policy, particularly, the inflation targeting (IT) framework in Ghana. Three (3) experts from academia (lecturers), two policy analysts and a chartered banker from the banking sector were purposively selected for the study. The questions that the study sought to address focused mainly on operational independence of the CB, monetary-fiscal policy coordination, communication strategy, transparency and accountability of CB, monetary transmission mechanism and challenges facing IT regime and inflation management in Ghana. The key themes that emerged from the interviews were discussed and identified using thematic analysis. Since representative quotes were reported, I identified the respondents by assigning alphabets to them.

Perceptions on the Operational Independence of the Bank of Ghana in the Conduct of Monetary Policy

The theoretical literature on the CBI suggests that CBs that are shielded from direct political interference have a stronger mandate to pursue price stability and reduce inflation bias (Barro & Gordon, 1983b; Jacome & Vazquez, 2008; Kydland & Prescott, 1977; Rogoff, 1985; Walsh, 1995). In response to the above arguments, the study explored the views of the participants on how the independence status of BoG has affected the conduct of monetary policy in Ghana.

In relation to the findings of the perceptions of the respondents on the independence status of BoG in enhancing the conduct of monetary policy in Ghana, it was observed that the respondents were in favour of the operational independence of the CB. Some of the responses provided suggest that the CB has been quite successful after the attainment of the independence status in 2002. This has improved the conduct of monetary policy; enhanced collaboration and coordination of banking operations and aids in making informed decisions with stakeholders. In addition, price stability was identified as the main theme related to the independence of the CB. For instance, a respondent, who is a lecturer said:

> …this current regime is much better, it is robust, quite successful, improving conduct of monetary policy and it is also global standard and the Bank of Ghana is actually conducting it quite well. Their independence I will say is 90 per cent or more.
>
> Interviewee A

The official of BoG also commented in support of the independence of CB. To him:

> When we are taking decisions, we don't have to be watching over our shoulders. So the independence is very, very important. We need to be able to take decisions, but we have to recognise that we don't live on "Robinson Crusoe Island". Independence doesn't mean that we are like a colony sitting somewhere; we have to collaborate and coordinate. We have to coordinate activities with the fiscal authority, but we require operational independence.
>
> Interviewee H

The views that emerged from the respondents confirmed the theoretical literature that CB operational independence is desirable for good practice in monetary policy (Amato & Gerlach, 2002). However, the operational independence of the CB alone does not necessarily lead to a low stable price. Empirical study by Agoba *et al.* (2017) and Kasseeah *et al.*

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(2011) on Africa showed that other conditions including fiscal discipline, banking sector development and institutional quality are required to ensure effectiveness of CBI in reducing inflation.

Furthermore, the literature is not clear as to whether the government appointees assigned to the board of the CB or the representatives of the fiscal authority on the monetary policy committee (MPC) would weaken the independence of the CB and thus negatively affect the credibility of the monetary policy framework pursued by the CB. On the other hand, the IMF made a strong case against the representatives of the MoF on the MPC of BoG in 2015 as part of Ghana-IMF Extended Credit Facility arrangement arguing that it would compromise the independence of the CB and eventually affect the credibility of the IT framework pursued by BoG.

The responses to whether the government appointees to the board of BoG or the representatives of MoF on the Monetary Policy Committee (MPC) of BoG weaken the independence of the CB had two different views. The position of one of the groups was that the presence of government appointees or representatives of MoF on the MPC of BoG would negatively affect the operations of the BoG.

A respondent reported that:

" *…the representatives of MoF play a very significant role there but I think to some extent they compromise the independence of Bank of Ghana".*
                                                                Interviewee D, Policy analyst

The other respondents argued that the presence of the appointees on the board or representatives of MoF on the MPC may not undermine the work of BoG. To them, their inclusion would allow constructive decisions to be arrived at due to the knowledgeable nature of appointees about the conduct of

monetary policy.

> Now the functional autonomy of the Bank of Ghana in adopting inflation targeting is guaranteed under the Bank of Ghana Act 612 (2002) so the presence of the representatives of MoF on the monetary policy committee may not affect the independence of the BoG.
>
> <div align="right">Interviewee C, Lecturer</div>

Response from the official of BoG supports the argument that the decision to appoint external members onto the MPC is a step in the right direction. To him, the amendment of BoG Act 612 (2002) now mandates the BoG to appoint two external members (who were previously appointed by the MoF) to be affirmed by the Board and this has entrenched the independence of the CB.

Moreover, the respondents had contrasting opinions as to whether the presence of the government appointees to the board of BoG or the representatives of MoF on the MPC positively or negatively affect the credibility of IT framework. The of BoG and the MoF supported their inclusion and argued that it would positively enhance coordination and collaboration between them and that it would not weaken the credibility of the IT regime. A quote that throws more light on this position is:

> The general perception is that the representation of the Ministry of Finance on the monetary committee compromises the credibility of the Central Bank. We believe that whatever discussions that take place will be on technical level, but not necessarily to bring political influence.
>
> <div align="right">Interviewee G, Official of MoF</div>

In similar vein, the official of BoG added:

> The Board of BoG has an administrative overview over all activities of the bank, but they have no influence, directly or indirectly, on the monetary policy committee. ... successful monetary policy requires coordination with the fiscal policy otherwise, when one messes up it affects the other.
>
> <div align="right">Interviewee H</div>

In contrast, the other interviewees categorically stated that the inclusion of the representatives of MoF would have a dire consequence on the credibility of IT framework. The following quotations buttress this point:

> I am not saying at all that the Ministry of Finance should not play any role, but it is important that the CB is seen to be free from the dictate of MoF and it is not just seen within the Bank, but it must be seen by the public.
>
> Interviewee B, Lecturer

> It doesn't necessarily undermine the effort but sometimes the input that you receive from them might not be what you want. There is the need to get input from the government in power. The two should work hand-in-hand which is very good.
>
> Interviewee F, Banker

The responses above clearly suggest that there is no consensus as to whether the representatives of MoF on the MPC would undermine the independence of the CB. However, majority of the participants perceived the presence of the representatives of the MoF on the MPC to take away some credibility attached to the functions of the CB in consonance with the IMF position. It is also worth noting that unlike the MPC of BoG, the representative of Treasury on MPC of the Bank of England does not vote in order to influence decisions of the MPC, but his presence helps in policy coordination.

Monetary-Fiscal Policy Coordination

Recent studies have shown that successful IT regimes in emerging economies are supported by strong commitment of the fiscal authority to lower budget deficit. This requires stronger policy coordination between monetary and fiscal authorities in achieving price stability and sustainable economic growth (Hasan & Isgut, 2009; Laurens & De la Piedra, 1998).

Concerning the level of policy coordination between the BoG and MoF, two different views emerged out of the interviews. The monetary and fiscal authorities maintained that they have always collaborated in their policy formulations and the level of coordination has been very positive. The interviewee from the fiscal side said:

> We have always collaborated in our policy formulations as I said. We cannot necessarily divorce fiscal policy from monetary policy. The two work hand-in-hand and anything that we do, we always look at the monetary and the fiscal implications. So monetary policy and fiscal policy are coordinated through the national budget as well as the Economic Management Team.
>
> Interviewee G

From the monetary authority, the respondent stated:

"The level of coordination is very positive. ...because the requirement for successful monetary policy is coordination with the fiscal policy".

Interviewee H

On the other hand, most of the respondents held the view that although there has been some level of policy coordination between the two authorities, it has been a bit weak. They unanimously attributed the inadequate policy coordination to lack of fiscal discipline on the part of government coupled with the fact that monetary policy sometimes becomes secondary to the fiscal policy. Two respondents had this to say:

"...the level of coordination to some extent is there but because there is lack of fiscal discipline for a very long time, it is not easy to have a very efficient and effective coordination".

Interviewee D, Policy analyst

> As a matter of fact, it is the inadequacy of the coordination that leads to all these discussions we should be having about the independence of the Central Bank. […]. ...if you could put your fiscal imbalances under control, you would avoid fiscal dominance and it would enhance the conduct of monetary policy.
>
> Interviewee E, Policy analyst

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The position of the officials of BoG and the MoF is in support of the theoretical literature which suggests that a strong policy coordination is paramount to effective conduct of monetary policy in maximising societal welfare (Andlib *et al.*, 2012). On the other hand, the view shared by the majority of respondents is in consonant with an empirical study by Tarawalie *et al.* (2013) who found evidence of a weak policy coordination between the monetary and fiscal authorities in the WAMZ countries.

Moreover, excessive domestic borrowing by the fiscal authority has been found to crowd out lending to private sector and compromise the attainment of stable price by the monetary authority (Baldini & Poplawski-Ribeiro, 2011; Bua, Pradelli & Presbitero 2014). This study showed that government borrowing from the domestic market has both positive and negative implications on the conduct of monetary policy in Ghana.

It emerged from the interaction with the respondents that government borrowing apart from crowding out the private sector, increases the cost of accessing credit, a contributory factor of cost-push inflation. It also increases levels of bad debts when government defaults in payment of its debt obligations. In support of this claim, two respondents shared the following views:

> One of the effects is the increase in lending rates because the treasury bills and bonds issued by government to mobilise resources have very high rates. ... higher cost of credit will feed back into cost-push factors and ultimately inflation.
>
> Interviewee D, Policy analyst

> One of the problems we have in this country is managing the fiscal not even the monetary is our governments' delay in honouring their payment obligations and they pile up arrears. That is part of the problem with the non-performing loans…
>
> Interviewee E, Policy analyst

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On the contrary, one participant indicated that government domestic borrowing through the issuance of foreign currency-denominated bonds increases the inflow of foreign currency which stabilises the depreciation of the Ghana cedi.

"I think that has had some advantage because when the local bonds are being bought by foreign agents they push in foreign currency which helps stabilise or at least reduce the pressure on the cedi".

Interviewee A, Lecturer

Prior to 2016, the BoG Act 612 (2002) section 30 allowed the BoG to finance government deficit (net domestic financing) up to 10 per cent of the previous year's revenue and in most cases, the CB exceeded the threshold. For this reason, the study further enquired whether the zero-financing of government deficit by the CB as part of the Ghana-IMF Extended Credit Facility arrangement would strengthen the framework for inflation targeting as well as enhance credibility of IT as perceived by the IMF.

The question relating to zero-financing attracted varied views from the respondents. The respondents who were in support of the zero-financing of government deficit argued that it is good for Ghana because it may deliver good results and strengthen the framework for IT. This is what one respondent from academia reckoned:

"...if it has been implemented and the result we are seeing in inflation looks good, I will say the new regime with the zero-financing from the Central Bank is working".

Interviewee A, Lecturer

In support of this view, another respondent commented:

"...zero-financing of government deficit by the Bank of Ghana will give some kind of stability into the financial system".

Interviewee F, Banker

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Others also believed that although zero-financing of government budget may strengthen the conduct of monetary policy in Ghana, it is too harsh, restrictive and somewhat "box jacket" which gives government no leeway to borrow from the CB to meet any unforeseen contingencies. They also indicated that the five (5) per cent financing of government deficit passed into law by parliament is good, but the funds should be channelled into growth enhancing sectors of the economy. In line with this observation, one respondent indicated:

> The zero-financing agreement with the IMF is so strict, it is so restrictive. Even the five per cent government deficit financing, the money that would be generated should be invested in self-liquidating productive sectors and it will come back to benefit all of us.
>
> Interviewee C, Lecturer

In contrast, one respondent who took a neutral stance argued for fiscal discipline and accountability in the utilisation of the public resources since funds are wasted through corrupt practices which feed into fiscal deficit and demand-pull inflation.

> …it is not zero financing that I will opt for… it is not necessarily the issue of fiscal dominance but how we use the resources properly, particularly, for investment purposes and whether the money is being used for what it is planned.
>
> Interviewee D, Policy analyst

One of the "preconditions" of IT is absence of fiscal dominance (Amato & Garlach 2002; Mishkin & Savastano, 2001; Masson, Savastano & Sharma, 1997). Perhaps due to Ghana's past experience with fiscal imbalances the suggestion of zero-financing by IMF may curb fiscal dominance and therefore boost the conduct of monetary policy in consonance with the literature. Though zero-financing is commendable, it is not a sufficient condition for achieving price stability particularly for a developing country

like Ghana. For price stability to be achieved, zero-financing should be complemented by a strong adherence to fiscal discipline. Nevertheless, the passage of five (5) per cent financing of government deficit into law would enable government to meet other unforeseen contingencies such as the payment of wages and salaries and other public investment expenditure.

Communication Strategy, Transparency and Accountability

This study also found that transparency and accountability of the BoG under IT regime have improved significantly compared to the monetary targeting regime and this is consistent with recent studies on CB's communication strategy, transparency and accountability (Egbuna *et al.* 2014; Neuenkirch, 2012).

Concerning the transparency and accountability of monetary policy process, all the respondents shared the view that inflation targeting framework has improved the conduct of monetary policy in Ghana. They observed that inflation targeting framework enhances transparency and accountability of monetary policy process because it is open to the public through press conferences (public discussions), press releases and mandatory periodic announcements of its monetary policies. Two respondents from academia narrated:

"…*the fact that the committees work is open to the public and the press is available to see what discussions took place etc. is probably the biggest representation of the openness and transparency*".

Interviewee B, Lecturer

"…*it opens itself for communication, dialogue with the media; they ask questions bordering on the rational and how policy decisions were taken. By so doing you are being transparent and that is the way they account to the public*".

Interviewee D, Policy analyst

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In throwing more light on transparency and accountability, one policy analyst suggested that the governor should be compelled to appear before some reputable state institutions such as the parliament or its committee on finance to explain in detail the policy decisions of BoG. In his words:

> …I would like that there is a way the Central Bank engages beyond the press because unfortunately as some people observed the depth of a journalist is not as the same as the depth of a specialist in economics or something like that.
>
> <div align="right">Interviewee E</div>

On the effectiveness of communication strategy of BoG, majority of the respondents were of the view that there has been a significant progress in the approach adopted by the CB in communicating with key stakeholders (mainly banks and other institutions) through press conferences, press releases and publication of dates for MPC meetings ahead of time. However, they suggested that the CB's communication should not be limited to key stakeholders, but it should be extended to the wider society. The interviewee C recounted:

"... I can see a great progress in terms of communication which is essential to promote transparency and accountability to strengthen inflation targeting framework".

In furtherance to this position, interviewee F noted:

> Yes, that has been quite effective. But if you are talking about let's say microfinance institutions, I am not sure they have been quite effective. In terms of communicating to the wider society, you know their impact has not been well felt.

On the other hand, one interviewee categorically indicated that the communication strategy of the BoG has not been effective since few people understand the technical language used in communication.

> "…it is not effective. I think one of the areas they probably need to do more is communication. Because very few people actually know what they do and how they do it. And so I think

they can do more by communicating to the grassroots, to the ordinary people not just in Accra but across the country".

<div align="right">Interviewee A, Lecturer</div>

We observed from the opinions shared by the respondents that key to the CB's transparency, accountability and credibility is the need for the BoG to find innovative ways of reaching out to the wider society. This is because not everybody understands the communication of the BoG due to relatively high level of financial illiteracy in Ghana. The BoG could engage the wider society through organisation of public fora, durbars and strategic meetings (with religious groups, social clubs, etc.).

Monetary Policy Transmission and Lending Rates Charged by the DMB

The study also revealed that apart from the inefficient financial system and shallow capital market, access to alternative sources of funds for the DMBs, high non-performing loans, unbridled government borrowing domestically and higher risk in lending are the main factors causing weak monetary transmission in Ghana. Two respondents said:

"If there are a lot of bad debts then they have a cost problem; then no matter what even if the Central Bank lowers the monetary policy rate, the transmission will not work".

<div align="right">Interviewee F, Banker</div>

"High cost of credit and government unbridled government borrowing lead to high lending rate and interest rate spread. This affects monetary transmission mechanism in Ghana".

<div align="right">Interviewee D, policy analyst</div>

The respondents suggested that government should reduce its borrowing in order to reduce the Treasury bill rate since there is rather a direct correlation between Treasury bill rate and lending rate.

The observation of rising cost of capital and low level of financial development as identified corroborate a study by Mishra and Montiel (2013)

who found that low financial development and a rising marginal cost of lending might undermine the effectiveness of CB policy actions in influencing commercial bank lending rates in low income countries. Nonetheless, alternative sources of funding to DMBs, especially, the international universal banks also retard monetary transmission mechanism in Ghana.

Regarding the interest rate spread in the banking sector, the respondents generally acknowledged that interest rate spread has been excessively huge as compared to those of other Sub-Saharan African countries. Interestingly, the quest to find out whether government should regulate interest rate in Ghana yielded divergent views. Some opined that interest rate must be market determined but there should be certain guidelines to regulate the interest rate spread in order to check outrageous lending rates charged by some banks. One policy analyst indicated:

"Interest rate must be market determined but I think some guidelines must be there. Yes, not only the regulation but the compliance".

Interviewee D

Others believed that government intervention would drive out credit to private sector because it cannot force banks to give out credits. The official of BoG had this to say:

"…*so we do not control interest rate, we have been through that era and it did not work* […]. *Interest rate intervention drives out credit and it kills the private sector".*

Interviewee H

In contrast, one respondent in his narrative maintained that he would welcome government intervention on condition that it would reduce its domestic borrowing and create a stable, predictable macroeconomic environment. To him:

"… I will welcome the interventions but government should play its part in terms of stabilising the macro economy, borrowing less through treasury bills and hence, reducing the cost of loanable funds…"

<div align="right">Interviewee A, Lecturer</div>

When probed further about solutions to address the huge interest rate spread, it was suggested that while the CB could use moral suasion, DMBs should also reduce their operational costs. Moreover, the government together with the CB should put in pragmatic measures to reduce the high non-performing loans. To this effect, the official of BoG explained:

> We are taking a holistic approach to supervision, we are going to use moral suasion and we are looking at measures to bring down the NPLs so that the mark-up that they have to put on it will reduce and hopefully the gap will be smaller between lending rates and deposit rates.

<div align="right">Interviewee H</div>

` The responses above suggest that huge interest rate spread is worrisome as it hinders the growth of small and medium scale enterprises in Ghana. For instance, the average interest rate spread in Ghana between 2011 and 2016 stood at 22.17 per cent as compared with the Sub-Saharan average of 7.05 per cent (Central Bank of Kenya, 2018). Besides, the participants by consensus were not in support of government intervention in capping interest rate as it had been implemented in Kenya. However, there is the need for the BoG to regulate the interest rate spread based on its assessment of true cost of funds as noted by Kwakye (2011).

Challenges of IT Monetary Policy framework in Ghana

The study also sought to explore the key challenges facing inflation targeting framework in Ghana. It emerged that the challenges are both technical and structural. Technical challenges identified include inadequate technical staff with analytical capabilities and access to timely high frequency

data needed for forecasting while the structural challenges bordered on exogenous shocks arising from commodity price shocks, exchange rate depreciation and food supply shocks. Other problems raised were fiscal dominance and weak coordination.

"The country itself is exposed to several exogenous shocks which have far reaching consequences on the management of the economy and inflation. ...commodity prices slump, depreciation and supply shocks feed into inflation".

Interviewee E, Policy Analyst

"There are issues with analytical capabilities, availability of high frequency data and the high pass through of the exchange rate depreciation to inflation".

Interviewee C, Lecturer

The technical and structural challenges of IT framework identified by the respondents fall short of the essential "preconditions" for adopting the IT framework as espoused by Amato and Garlach (2002), Mishkin and Savastano (2001), and Masson *et al.* (1997). Nevertheless, IT regime has improved the conduct of monetary policy in Ghana and it is believed that given the chance, IT has potential to even perform better in future when the challenges are ameliorated (Kwakye, 2013; Bawumia, 2010; Bawumia *et al.*, 2008).

The interviewees further proposed the following measures to address the challenges facing inflation management in Ghana under the IT regime. The proposed measures encompass improvement in food supply, fiscal discipline, fight against corruption, ensuring accountability in the use of public funds, strong policy coordination between fiscal and monetary authorities and capacity building for the technical staff of BoG. From the perspective of the BoG, it was observed that training schemes are put in place to provide the needed capacity development for the staff with the support of the IMF and Bank of England. On the other hand, the fiscal authority shared

the view that the implementation of Public Financial Management (PFM) Act would reduce fiscal dominance and impact positively on inflation targeting framework. According to one policy analyst:

"There is the need for fiscal discipline, tackling corruption which feeds into fiscal deficit and accountability".

<div align="right">Interviewee D</div>

The official of BoG added:

"The Central Bank has a training scheme that provides the necessary capacity development. We team up with our partners, the IMF and Central Bank of England to provide the required training to the staff".

<div align="right">Interviewee H</div>

The respondents were quizzed further on whether there should be alternative monetary policy framework due to challenges facing the adoption of IT framework. Unanimously, the respondents maintained that the IT framework has come to stay, but measures should be taken to address the key challenges facing successful implementation of IT. One respondent, however, called for a dual mandate goal focusing on price stability and output growth as being practised in the USA. A lecturer responding to this said:

"I would recommend inflation targeting as something that we should continue practising and perfect it if possible. It is clear, it makes the main role of the Central Bank very clear and they are not chasing too many targets".

<div align="right">Interviewee A</div>

Adding his voice on the issue, another respondent mentioned:

"The Central Bank should have a dual mandate goal, combine real GDP and inflation targeting so that while it is looking at inflation it will also be looking at economic growth".

<div align="right">Interviewee C, Lecturer</div>

Conclusion

The study explored experts' perceptions on the conduct of monetary policy in Ghana. Results of the study showed that the independence of the CB has enhanced the conduct of monetary policy in Ghana in achieving price

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stability. However, the level of coordination between the monetary and fiscal authorities is not strong enough to promote price stability due to fiscal indiscipline. Furthermore, the progress made in communication strategy has improved transparency, accountability and credibility of the BoG. Rising cost of capital, low financial development and access to alternative sources of funding for DMBs were identified as factors limiting monetary transmission mechanism in Ghana. The study also identified technical and structural factors including fiscal dominance as the key challenges militating against successful implementation of IT in Ghana. Though the adoption of IT regime has been plagued by technical and structural factors, it has improved the conduct of monetary policy in Ghana.

CHAPTER SEVEN

EFFECT OF DOMESTIC DEBT ON PRICE LEVEL IN THE WEST AFRICAN MONETARY ZONE

Introduction

Chapter Seven is sub-divided into two parts. The first part presents the summary statistics of variables under study in addition to the panel unit root and cointegration tests. The second part focuses on the discussion of the results on the effect of domestic debt on price level in monetary targeting WAMZ countries comprising Nigeria, the Gambia, Sierra Leone and Guinea. The discussion of the results lays emphasis on the extent to which domestic debt, a proxy for fiscal dominance, constrains the conduct of monetary policy in the WAMZ in controlling price level.

Summary Statistics of Variables Used for the Study

The summary statistics of the variables under `study are presented in Table 12. The descriptive statistics largely centred on the location and variability of the data. The results indicated that all the variables have positive average values. The average GDP per capita at purchasing power parity of the zone (GPC) amounted to $2245.26 over the study period with a standard deviation of $1456.49 depicting high variability in the economic performance of the zone.

Table 12: Descriptive Statistics

	GPC	CPI	M2G	DD	NER	WFI
Mean	2245.26	89.20	5.11	0.15	0.011	131.95
Maximum	5671.90	190.40	38.30	0.66	0.07	188.62
Minimum	858.57	23.93	-12.08	0.014	0.0001	77.48
Std. Dev.	1456.49	41.00	6.15	0.12	0.02	36.03
Observations	240	240	240	240	240	240

Source: Author (2018).

The consumer price index (CPI), one of the key criteria for macro stability of the zone, averaged 89.2 over the study period, ranging from 23.93 to 190.4. This implies that, largely, inflation has been moderately high during the study period. Also, the mean broad money growth (M2G) recorded in the zone is 5.11 with a standard deviation of 6.5 compared with a mean domestic debt to GDP ratio (DD) of 0.15 and a standard deviation of 0.12. In addition, the average world food price index (WFI) recorded over the period stood at 131.95 with a standard deviation of 36.03 which shows a greater fluctuation. Also, the average rate of exchange over the study period is $0.01 with a standard deviation of 0.02 which clearly depicts a considerable variability in the exchange rate.

Panel Unit Root Tests

The study used ADF-Fisher Chi-square and PP-Fisher Chi-square of Maddala and Wu (1999) and IPS panel unit root tests to test for the stationarity of the series. The results of the panel unit root test indicate that all the variables except broad money growth are non-stationary at levels but become stationary after first difference. This suggests that all the variables except money growth are I (1). The stationarity test results provide justification for using cointegration models. The results of the panel unit root tests are presented in Appendix S.

Panel Cointegration Tests

The study employed Kao (1999) and Johansen Fisher panel cointegration tests due Maddala and Wu (1999) to test for cointegration among the variables. Both Kao and Johansen Fisher panel cointegration tests confirmed long-run equilibrium relationship among the variables for the different empirical models. Appendix T shows the results of the Kao panel cointegration tests for all the models. The null hypotheses of no cointegration were rejected at 1 per cent level of significance for models 1 and 2. On the other hand, the Johansen Fisher panel cointegration tests as shown in Appendix U indicate that both trace and maximum eigenvalue test statistics reject the null hypotheses of at least three cointegration equations for models 1 and 2. This suggests existence of long-run relationship among the variables, confirming the Kao cointegration test.

Panel Fully Modified (FMOLS) and Dynamic OLS (DOLS) Results

Based on the evidence of cointegration, the study provides the long-run panel FMOLS and DOLS estimates of effect of domestic debt and net effect of interactive term for domestic debt and money growth on price level. The discussion on results for model 2 focuses on the effect of domestic debt on price level and inflationary effect of money supply conditioned on domestic debt.

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Table 13: Results of Effect of Domestic Debt on Price Level

Variable	Panel FMOLS Estimates		Panel DOLS Estimates	
	Model 1	Model 2	Model 1	Model 2
M2G	0.8847**	0.0102**	0.1367***	0.0364***
	(0.3604)	(0.0041)	(0.0462)	(0.0085)
DD	0.5866***	0.2522**	0.2642**	0.6217*
	(0.3834)	(0.1482	(0.1318)	(0.3367)
GPC	0.9351***	0.9663***	0.9237***	0.9864***
	(0.16635)	(0.1637)	(0.2139)	(0.0010)
NER	0.9207***	0.8931***	0.8753***	0.7769***
	(0.0691)	(0.0693)	(0.0728)	(0.0682)
WFI	0.4573***	0.4607***	0.4951***	0.5332***
	(0.0874)	(0.0859)	(0.1016)	(0.8826)
DD*M2G	-	0.0591**	-	0.2797***
		(0.0293)		(0.0709)
R²	0.9379	0.9016	0.9384	0.9782
Adj R²	0.9357	0.8981	0.9360	0.9661
S.E.	0.1272	0.1691	0.1269	0.0900
Long-run va.	0.0424	0.0133	0.0407	0.0135

*Note: Dependent variable is Price Level. ***, **, * indicate 1%, 5% and 10% respectively. Standard errors are shown in the parentheses.*
Source: Author (2018).

Models 1 and 2 of the panel FMOLS and DOLS estimates are presented in Table 13. The panel FMOLS and DOLS estimates reveal that domestic debt has a significant positive effect on price level as indicated in model 1. For instance, the panel FMOLS estimate shows that a 1 per cent increase in domestic debt induces about a 0.59 per cent rise in price level significant at 1 per cent. Similarly, the panel DOLS estimate indicates that a 1 per cent increase in domestic debt increases price level by about 0.26 at 5 per cent level of significance. This finding suggests that public debt plays important role in price level determination in the WAMZ countries and this is

consistent with the fiscal theory of the price level. In consonance with the fiscal theory of the price level, excessive financing of fiscal deficit tends to fuel inflation through wealth effect which stimulates increase in demand for goods and services.

Again, the results imply that excessive fiscal deficit financing through the issuance of debt in the domestic market increases the cost of borrowing and debt servicing interest charges, especially, when the debt instruments are short to medium term. This, in turn, increases fiscal deficit which fuels inflation. The result is consistent with empirical findings by Baldini and Poplawski-Ribeiro (2011) on Sub-Saharan Africa, Kwon *et al.* (2009) on developing countries and that of Bildirici and Ersin (2007) for emerging economies.

Similar to model 1, I provide statistical evidence in model 2 to show that domestic debt has a positive effect on price level. The result is statistically significant at 5 per cent and 10 per cent in the FMOLS and DOLS, respectively. The study further provides evidence that the inflationary effect of money growth conditioned on domestic debt is positive and significant at 5 per cent and 1 per cent for panel FMOLS and DOLS, respectively, as indicated in model 2. Mathematically, the estimate of the Panel FMOLS model is expressed as:

$$CPI = 0.0101M2G + 0.2521DD + 0.9663GPC + 0.8930NER + 0.4606WFI + 0.0591(DD * M2G)$$

The net effect of changes in money supply growth on price level is therefore estimated as:

$$\frac{\partial(CPI)}{\partial(M2G)} = 0.0101 + 0.0591\overline{DD}, \text{ but } \overline{DD} = 0.1544.$$

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$$\frac{\partial(CPI)}{\partial(M2G)} = 0.0101 + 0.5091(0.1544)$$

$$\frac{\partial(CPI)}{\partial(M2G)} = 0.0887$$

Thus, given the level of domestic debt, an increase in money supply growth induces further increase in price level by about 0.09.

Similar to the mathematical expression for panel FMOLS, the estimate of the Panel DOLS model is given as:

$$CPI = 0.0326M2G + 0.6217DD + 0.9864GPC + 0.7769NER + 0.5332WFI \\ + 0.2797(DD * M2G)$$

The net effect of changes in money supply growth on price level given that $\overline{DD} = 0.1544$ is estimated as:

$$\frac{\partial(CPI)}{\partial(M2G)} = 0.0326 + 0.2797\overline{DD}$$

$$\frac{\partial(CPI)}{\partial(M2G)} = 0.03264 + 0.8619(0.1544)$$

$$\frac{\partial(CPI)}{\partial(M2G)} = 0.1657$$

The result shows that in the presence of fiscal dominance, a 1 per cent increase in money supply growth leads to approximately 0.2 per cent increase in price level. Hence, fiscal dominance poses constraint to the conduct of monetary policy in the WAMZ in achieving single digit inflation as pointed out by Kwakye (2011). The results suggest that in the midst of excessive deficit financing, achieving price stability by the independent CBs in the WAMZ will be a difficult task. The results corroborate the argument by Fialho and Portugal (2005) and Christiano and Fitzgerald (2000) that for independent CBs to achieve price stability, they must convince the fiscal authorities to adopt appropriate fiscal policy. The implication is that to

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achieve price stability, various fiscal authorities in the WAMZ should strictly comply with the deficit to GDP ratio benchmark. This also requires strong policy coordination and collaboration between the monetary and fiscal authorities in the various WAMZ countries.

The results of both panel FMOLS and DOLS estimates in model 1 also reveal that all the control variables in model 1 have significant positive long-run effect on price level, consistent with the literature. For instance, the results indicate that a 1 per cent increase in money growth induces a 0.88 per cent rise in price level based on the FMOLS results as compared to 0.14 of the DOLS. This finding means that an expansionary monetary policy increases demand for commodities which causes demand-pull inflation. This confirms the findings of Tarewalie *et al*. (2012) for WAMZ countries such as The Gambia, Sierra Leone including Nigeria and that of Thornton (2008) for Africa.

With regard to the real income, both the panel FMOLS and DOLS estimates show that a 1 per cent increase in real income leads to about 0.9 per cent increase in price level, respectively. The results suggest that higher incomes increase aggregate demand for goods and services. When this increase in aggregate demand is not supported by increase in output, it will cause domestic inflation. This is consistent with the result obtained by Nguyen (2015) for a sample of twelve Asian countries but in sharp contrast to the results of Bleaney and Francisco (2016) for Sub-Saharan Africa.

The effect of nominal exchange rate on price level is significantly positive at 1 per cent for both the panel FMOLS and DOLS estimates. The panel FMOLS estimate indicates that a 1 per cent depreciation in exchange

leads to about 0.92 per cent in price level as compared to the 0.88 per cent of the panel DOLS. Thus, depreciation of the local currencies generates inflationary pressures within the WAMZ countries. This finding is in line with the results reported by Heintz and Ndikumana (2011) for African countries.

Similarly, world food price index has a significant positive effect on price level suggesting that increase in world price index induces inflationary pressure within the WAMZ countries. Respectively, the panel FMOLS and DOLS estimates reveal that a 1 per cent increase in world food price index results in approximately 0.5 rise in price level. This result may be due to the high bills of imported food commodities from abroad by the WAMZ countries. This result is consistent with the finding of Durevall *et al*. (2013) for Ethiopia.

Diagnostic Tests for Panel FMOLS and DOLS Estimates

Although Panel FMOLS and DOLS are noted for correcting heterogeneity and collinearity problems, the corrections are not necessarily complete as pointed out by Adom *et al*. (2014). Hence, I employed the coefficient variance decomposition to determine further sources of heterogeneity and collinearity, and correct them in the models. The results of panel FMOLS coefficient variance decomposition for models 1 and 2 are presented in Appendices V and W while that of the DOLS are presented in Appendices X and Y, respectively. The top part of the table shows the eigenvalues of the matrix with the condition numbers below. The second part of the table displays the decomposition proportions with the first column showing the eigenvalues associated with the lowest condition numbers. Any two or more regressors with the eigenvalues of more than 50 per cent provide

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evidence of potential collinearity problems among the variables (Belsley *et al*., 2005).

The results of coefficient variance decomposition indicate that none of the estimated models has two variables with eigenvalues of more than 50 per cent. This suggests that there is no endogeneity or collinearity and reverse causality; therefore, the parameter estimates are correctly identified. On the other hand, the adjusted R-square of the panel FMOLS and DOLS for model 1 suggests that the independent variables explain about 93.6 per cent, respectively, of the variations in price level. Similarly, about 89.8 and 96.6 per cent variations in price level are accounted for by the variations in the explanatory variables in the case of model 2.

Conclusion

The study sought to examine the effect of domestic debt on price level by exploring the extent to which domestic debt contributes to ineffectiveness of monetary policy in achieving price stability in the WAMZ countries. The study used quarterly data over the period 2001 to 2015 and panel FMOLS and DOLS estimation techniques. The results of both panel FMOLS and DOLS estimates revealed that domestic debt and the interactive term for domestic debt and money supply growth have significant positive effects on price level. This is an evidence of fiscal dominance which constrains the monetary authorities' efforts in curbing inflation to achieve the objective of price stability in the WAMZ countries. The implication is that various fiscal authorities in the WAMZ countries should strictly adhere to the fiscal deficit to GDP ratio criterion to complement the efforts of the CBs in controlling inflation.

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CHAPTER EIGHT

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the summary, conclusions and recommendations of the study including suggestions for future research. It begins with the summary of the entire work followed by the conclusions drawn from the study. This chapter also highlights the contributions and limitations of the study. The chapter concludes with policy recommendations based on the conclusions drawn from the study and makes suggestions for further studies.

Summary of Findings

The purpose of the study was to investigate the effectiveness of monetary policy in the WAMZ member states excluding Liberia. Specifically, the study sought to investigate the channels of monetary policy transmission mechanism in the WAMZ and explore the perceptions of experts in assessing the performance of the Central Bank of Ghana in the conduct of monetary policy in Ghana. It also examined the extent to which domestic debt contribute to monetary policy ineffectiveness in influencing price level in the WAMZ.

To achieve the first objective, which examined the channels of monetary policy transmission, the study used monthly time-series data from 2001 to 2014 for country-specific analyses of four WAMZ member states comprising Ghana, Nigeria, The Gambia and Sierra Leone. Similarly, quarterly data on price, real output, policy rate, reserve money, lending rate, credit to private sector and nominal exchange rate covering the same period were used for panel analysis for four monetary targeting WAMZ countries

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including Nigeria, The Gambia, Sierra Leone and Guinea. The study employed the SVAR approach attributed to Amisano and Giannini (1997) for estimation. Following Gospodinov *et al.* (2013) and Sims *et al.* (1990) the SVAR models were estimated at levels to generate impulse response functions and compute variance error forecast decomposition for the analysis.

The results for the country-specific analyses found that channels of monetary transmission differ across the WAMZ member states. In particular, credit channel was found to be effective in Ghana and The Gambia, and a moderate exchange rate channel in Nigeria. Interest rate channel remains infective for all the countries in the zone. Moreover, results of the study revealed that innovations in base money had a stronger significant impact on price level for all the monetary targeting WAMZ countries except The Gambia. In the case of Ghana, changes in monetary policy rate had a significant and persistent effect on lending rate indicating a strong pass-through from policy rate changes to lending rate and a protracted effect on private sector credit. Also, the monetary policy shock has a significant effect in dampening inflation via lending rate in Ghana consistent with IT regime.

With regard to the panel analysis, the results found evidence of a strong exchange rate pass-through to price level in the monetary targeting WAMZ countries. Generally, the innovations in base money as monetary policy had insignificant effects on the financial variables for both country-specific and panel analyses for the monetary targeting WAMZ countries. This appear to suggest a weak transmission of monetary impulses to the financial sector which may be attributed to financial innovations and breakdown in money demand function.

Moreover, the study used in-depth interviews with the aid of interview guide to elicit the views and opinions of six purposively selected experts and, the officials of the BoG and MoF to assess performance of the CB in the conduct of monetary policy in Ghana. The experts for the study were selected based on their areas of specialisation, experiences and extent of knowledge in monetary policy. The study used thematic framework for the qualitative data analysis.

The results of the qualitative study revealed that the operational independence of the CB has enhanced the conduct of monetary policy in Ghana in achieving price stability even though the CB misses inflation targets. However, the level of coordination between the monetary and fiscal authorities was not strong enough to promote price stability due to fiscal indiscipline. Furthermore, the progress made in communication strategy has improved transparency, accountability and credibility of the BoG. Yet, high financial illiteracy tends to limit the CB's communication strategy. The study found rising cost of capital, low financial development and access to alternative sources of funding for the DMBs as factors limiting monetary transmission mechanism in Ghana. The study also identified technical and structural factors including fiscal dominance as the key challenges militating against successful implementation of IT in Ghana.

In examining the extent to which domestic debt contributes to the ineffectiveness of monetary policy in achieving price stability in the WAMZ, the study employed quarterly data on price level, an interactive term for domestic debt and broad money growth rate, and other controls variables (real GDP per capita at PPP, nominal exchange rate and food price index) over the

period 2001 to 2015. The study applied panel FMOLS and DOLS estimation techniques for the estimation. Results of both panel FMOLS and DOLS estimates revealed that the net effects of the interactive term of domestic debt and broad money growth rate, and domestic debt had significant positive effect on price level.

Conclusions of the Study

The results of the SVAR found that channels of monetary transmission differ across the WAMZ countries with credit channel being effective in Ghana and The Gambia, and moderate exchange rate channel in Nigeria. Again, interest rate channel remains ineffective for all the individual member states. The study concludes that the differences in the structure of the economy and monetary policy frameworks may have accounted for the heterogeneity in the channels of monetary transmission mechanism. Besides, the heterogeneity in the monetary transmission across the WAMZ countries will pose a challenge to effective harmonisation of monetary policies and a design of a common monetary policy framework for the zone. Similarly, the ineffective interest rate channel in the respective WAMZ countries may be attributed to the underdeveloped financial market and structural rigidities in the economies of WAMZ, which increase the operational costs and hinder the pass-through of monetary policy changes to the real sector.

With regard to the perception of experts in assessing the performance of the CB of Ghana on the conduct of monetary policy in Ghana, the study found that the operational independence of the BoG has enhanced the conduct of monetary policy in Ghana by providing a foundation for improved CB communication strategy. This has bought about transparency and

accountability of the monetary policy process in anchoring public inflation expectations. However, the level of relatively high financial illiteracy in Ghana and relatively 'low coverage' (focusing mainly on key stakeholders to the detriment of the wider society) has limited the effectiveness of CB's communication strategy.

The study also established that there exists some level of policy coordination between the monetary and fiscal authorities. Nevertheless, the level of policy coordination between the two authorities was not strong enough to support the conduct of monetary policy in the country due to fiscal indiscipline. The unbridled government spending tends to negatively affect the monetary authority's efforts in achieving price stability.

The results of both panel FMOLS and DOLS estimates showed that the net effects of the interactive term for domestic debt and broad money growth rate as well as domestic debt affect price level positively in the WAMZ. This is an evidence of fiscal dominance which constrains the monetary authorities' efforts in curbing inflation to achieve the objective of price stability in the WAMZ countries.

Recommendations

Although the study did not determine the causes of weak monetary transmission mechanism, the literature has established that structural rigidities and underdevelopment of the financial sector inhabit effective monetary transmission through interest rate channel in the WAMZ. Therefore, to ensure effective monetary policy transmission through interest rate channel, the study recommends that structural rigidities which tend to increase operational costs of lending in various WAMZ countries and underdeveloped financial sector

should be addressed by both fiscal and monetary authorities of respective countries. For instance, the high operational costs in banking sector in Sierra Leone and Nigeria partly arising from high cost of power supply could be reduced by the governments of respective countries either through provision of regular electricity power supply via public-private partnership or granting some amount of subsidy to the banks. This will invariably reduce the cost of operations which may improve monetary policy transmission mechanism.

Moreover, there is the need for the monetary authorities of various member countries such as Ghana and Nigeria to deepen their domestic financial systems through increasing the supply of medium-term and long-term securities. This will provide opportunities for the institutional investors to diversify their portfolios. This may help in improving financial intermediation and financial sector efficiency to enhance monetary policy transmission. Similarly, the respective fiscal authorities of The Gambia and Sierra Leone should intensify their efforts in developing the financial sector to improve upon financial intermediation and monetary policy transmission mechanism in their respective countries.

Given that there is seemingly high level of financial illiteracy in Ghana and the fact that a wider public is not engaged by the CB's communication approach, the study suggests that the CB should improve upon its communication strategy by engaging the wider society beyond the press through organisation of public fora, durbar and strategic meetings (with religious groups, social clubs and schools) in the regional capitals.

To strengthen the level of policy coordination between the fiscal and monetary authorities in Ghana, the government should ensure fiscal discipline

which is a prerequisite for successful implementation of inflation targeting framework in achieving a stable price. Fiscal discipline could be achieved through implementation and enforcement of fiscal policy rules to prevent any excesses in government spending. In this regard, the implementation of public financial management Act by the MoF which seeks to improve efficiency in public spending is a step in the right direction. However, the PFM Act must be enforced by the MoF to sanitise public spending without compromising a sustainable economic growth.

Concerning the issue of fiscal dominance in constraining the conduct of monetary policy in stabilising price level in the WAMZ, it is recommended that the various fiscal authorities, particularly, The Gambia, Sierra Leone and Guinea should pursue prudent fiscal policies aimed at reducing its fiscal deficit as a way of reducing government short to medium-term borrowing from the domestic markets. This calls for strict adherence to the fiscal deficit to GDP criterion to curb excessive deficits financing of government budgets. Finally, there is also the need to strengthen fiscal and monetary policy coordination in various member countries in order to control inflation.

Contributions to Knowledge

This thesis contributes to the existing literature on effectiveness of monetary policy in three ways. Firstly, by employing qualitative research approach, the study provides an in-depth understanding of the performance of CBs in achieving price stability. Particularly, the study makes significant contribution to the understanding of the operational independence of Ghana's CB in conducting monetary policy since the implementation of inflating targeting framework. This may initiate further qualitative studies into the

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conduct of monetary policy in other WAMZ member states to provide better understanding of the performance of CBs in achieving price stability.

Secondly, the study contributes to the existing empirical literature on monetary transmission mechanisms in the WAMZ by using time series data spanning 2001 to 2014. This is a multi-country study involving four WAMZ member states (Ghana, Nigeria, The Gambia and Sierra Leone) and thus provides further understanding into the conduct of monetary policy in the WAMZ. Most of the previous studies on the WAMZ are plagued with methodological flaws either by ignoring the transmission of monetary policy to price level and real output or by employing few observations with relatively large number of variables which adversely affect the degrees of freedom and reliability of the results.

This study also adds to the literature on the effect of fiscal policy on the conduct of monetary policy by examining the effect of domestic debt on price level in the WAMZ. With the exception of Baldini and Poplawski-Ribeiro (2011), previous studies on determinants of inflation in Sub-Saharan Africa ignored the role of domestic debt on price level in line with the FTPL.

Limitations of the Study

Unlike the panel studies on the WAMZ, the country-specific studies on channels of monetary transmission for the selected WAMZ member states excluded Guinea due to unavailability of monthly data on credit to private sector. Also, the study did not include fiscal policy variable in examining monetary transmission mechanism in order to evaluate the role of fiscal dominance in constraining the conduct of monetary policy in the WAMZ.

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This is because SVAR approach is limited by over-parameterisation. This did not affect the quality of the results in any way.

Moreover, the qualitative study on performance of the CBs in conducting monetary policy within the WAMZ was carried out exclusively in Ghana. Extending such qualitative study to other WAMZ member states would have provided better information in understanding the conduct of monetary policy in the respective countries.

Suggestions for Further Research

The study used SVAR approach which is appropriate for analysing dynamics in monetary transmission mechanism. However, SVAR approach is limited by relatively large number of variables to be estimated. Therefore, the study suggests that future studies on monetary transmission in the WAMZ may consider adopting Bayesian VAR and Factor Augmented VAR approaches in dealing with the challenge of over-parameterisation. This will enable future studies on the WAMZ to include additional useful variables including fiscal policy variables into the models as improvement of the methodology.

Furthermore, the study focused on investigating the relative importance of channels of monetary transmission in the WAMZ, but did not consider factors that limit effective monetary transmission mechanism. Therefore, future studies could consider investigating determinants of monetary policy effectiveness for clearer understanding of monetary transmission mechanism in the zone.

BIBLIOGRAPHY

Abradu-Otoo, P., Amoah, B., & Bawumia, M. (2003). *An investigation of the transmission mechanisms of monetary policy in Ghana: A Structural Vector Error Correction Analysis.* Bank of Ghana Working Paper No. WP/BOG-2003/02.

Acheampong, K. (2005). *Bank interest rate channel of monetary policy transmission in Ghana.* Bank of Ghana Working Paper No. WP/BOG05/10 Retrieved from https://www.bo g.gov.gh/p riva teconte nt/Publications/Staff_Working...wp 10.pdf.

Adenekan, A. T., & Ahortor, C.R. (2013). An empirical investigation into the monetary policy transmission mechanism in NIGERIA. *The West African Monetary Review, 2* (1), 89-117.

Adom, P. K., Zumah, F., Mubarik, A. W., Ntodi, A. B., & Darko, C. N. (2014). Analysing inflation dynamics in Ghana. *African Development Review, 27*(1), 1-13.

Adu, G., & Marbuah, G. (2011). Determinants of inflation in Ghana: An empirical investigation. *South African Journal of Economics*, *79*(3), 251-269.

Agoba, A. M., Abor, J. Osei, K. A., & Sa-Aadu, J. (2017). Central bank independence and inflation in Africa: The role of financial systems and institutional quality. *Central Bank Review, 17,* 131-146

Ahmad, M. J., Sheikh, M. R., & Tariq, K. (2012). Domestic debt and inflationary effects: An evidence from Pakistan. *International Journal of Humanities and Social Science, 2*(18), 256-263.

Ahortor, C. R., Adenekan, A., & Ohemeng, W. (2012). An estimate of inflation threshold in the WAMZ: The case of Ghana and Nigeria. *Journal of Monetary and Economic Integration, 11*(2), 158 - 201.

Aliyu, S. U. R., & Englama, A. (2009). *Is Nigeria ready for inflation targetin*g? Munich Personal RePEc Archive. Retrieved from http://mpra.ub.uni muenchen.de/14870/.

Allegret, J. P., & Benkhodja, M. T. (2015). External shocks and monetary policy in an oil exporting economy (Algeria). *Journal of Policy Modelling, 37*,652-667.

Amato, J. D., & Gerlach, S. (2002). Inflation targeting in emerging market and transition economies: Lessons after a decade. *European Economic Review, 46*(4-5), 781-790.

Amisano, G., & Giannini, C. (1997). *Topics in structural VAR econometrics*. Berlin: Springer.

Andlib, Z., Khan, A., & Ul Haq, I. (2012). The coordination of fiscal and monetary policies in Pakistan: An empirical analysis 1975-2011. *The Pakistan Development Review, 51*(4), 695–704.

Ashinze, J. O. (2003). *Convergence criteria of the West African Monetary Zone (WAMZ)*. Paper presented at the 5th Central Bank of Nigeria seminar on the proposed second west African monetary zone (WAMZ). Retrieved from www.cbn.gov.ng/out/publications/gui de lin es/pid/2004/wamz.pd.

Bade, R., & Parkin, M. (1988). *Central bank laws and monetary policy*. Retrieved from https://www.researchgate.net/profile/MichaelParkin3/ publication/2562808_Central_Bank_Laws_and_Monetary_olicy/lipdf.

Bagliano, F. C., & Favero, C. A. (1998). Measuring monetary policy with VAR models: An evaluation. *European Economic Review, 42,* 1069-1112.

Baldini, A., & Poplawski-Ribeiro, M. (2011). Fiscal and monetary determinants of inflation in low-income countries: Theory and evidence from Sub-Saharan Africa. *Journal of African Economies, 20*(3), 419-462.

Bank of Sierra Leone (2011). *Annual report and statement of Accounts.* Freetown: Bank of Sierra Leone. Retrieved from http://www.bsl.gov.sl/Publications.html.

Barbbie, E. (2005). *The basics of social research* (3rd ed.). Ontario, Canada: Wadsworth.

Barro, R. J., & Gordon, D. B. (1983a). Rules, discretion, and reputation in a model of monetary Policy. *Journal of Monetary Economics, 12*, 101-22.

Barro, R. J., & Gordon, D. B. (1983b). A positive theory of monetary policy in a natural rate model. *Journal of Political Economy*, *91*, 589–610.

Bascand, G. (2013). *Communication, understanding, and credibility*. Paper presented at Admirals Breakfast Club. 6th December, 2013. Auckland, Australia. Retrieved from https://www.rbnz.g ovt.nz//medi a/Reserve Bank/Files/.../Speeches2013/5555198.pd.

Bawumia, M (2010). *Monetary policy and financial sector reform in Africa: Ghana's experience*. Accra, Ghana: Combert Impressions Ghana Ltd.

Bawumia, M., Amoah, B., & Mumuni, Z. (2008). *Choice of monetary policy regime in Ghana.* Bank of Ghana Working Paper No. WP/BOG-2008/07. Retrieved from https://www.bog.gov.gh/privat econtent /Publicat ions/ StaffWorking_Pap/Choi per cent20of per cent20Moneta rypercen t20Policypercent20Regimeper cent20in per cent 20hana.Pdf.

Belsley, D. A., Kuh, E., & Welsch, R. E. (2005). *Regression diagnostics: Identifying influential data and sources of collinearity* (Vol. 571). New York: John Wiley & Sons.

Bentum-Ennin, I. (2014). International reserves accumulation and economic growth in the West African Monetary Zone. *International Research Journal of Marketing and Economic*s, *1*(9), 39-59.

Bernanke, B. S. (2010). *Central bank independence, transparency, and accountability.* Paper presented at the Institute for Monetary and Economic Studies International Conference. 25th May, 2010. Tokyo, Japan. Retrieved from ttps://www.Federalreserve.gov /news ev ents/sp eech/bernanke20100525a.m.

Bernanke, B. S. (2005). *Inflation in Latin America-A new era?* Paper presented at the Stanford Institute for Economic Policy Research Economic Summit. 11th February, 2005. Stanford, California. Retrieved from https://www.fe deralreserve.gov/boarddocs/speeches /2005/200 50211/.

Bernanke, B.S., & Blinder, A.S. (1992). The federal funds rate and the channels of monetary transmission. *American Economic Review, 82* (4), 901–927.

Bernanke, B. S., Boivin, J., & Eliaz P. (2005). Measuring the effects of monetary policy: A Factor-Augmented Vector Autoregressive (FAVAR) approach. *Quarterly Journal of Economics*, *3 20*(1), 87-422.

Bernanke, B. S., & Gertler, M. (1995). Inside the black box: The credit channel of monetary policy transmission. *Journal of Economic Perspectives*, *9*(4), 27 48.

Bernanke, B., S. Laubach, F. S. Mishkin & A. Posen (1999). *Inflation targeting: Lessons from the international experience*. Princeton: Princeton University Press.

Bernanke, B., & Mihov, I. (1998). Measuring monetary policy. *The Quarterly Journal of Economics, 113* (3), 869-902.

Bildirici M., & Ersin, O. Z. (2007). Domestic debt, inflation and economic crises: A panel cointegration application to emerging and developed economies. *Applied Econometrics and International Development*, *7* (1), 31-46

Blanchard, O. J., & Quah, D. (1989). The dynamic effects of aggregate demand and supply disturbances. *American Economic Review*, 79, 655-673.

Bleaney, M., & Francisco, M. (2016). Inflation and fiscal deficits in Sub Saharan Africa. *Journal of African Economies*, *25*(4), 529–547.

Blinder, A. S. (1982). *Issues in the coordination of monetary and fiscal policy*. NBER Working Paper 982. Massachusetts National Bureau of Economic Research.

Blinder A.S., Ehrmann, M., Fratzscher, M., De Haan, J., & Jansen, D. J. (2008). *Central bank communication and monetary policy: A survey of theory and evidence*. NBER Working Paper, No 13932. Retrieved from https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp898.pdfon.

Boivin, J., & Giannani, M. (2006). Assessing changes in the monetary transmission mechanism: A VAR approach. *The Review of Economics and Statistics, 88*(3), 445-462.

Born, B., Ehrmann, M., & Fratzscher, M. (2011). *Central bank communication on financial stability. European Central Bank* Working Paper Series No.1332/APRIL 2011. Retrieved from https://www.ecb.europ a.eu/pub/pdf/s cpwps/ecbwp1332.pdf.

Bouwman, K., Jong-A-Pin, K., & De Haan, J. (2005). On the relationship between central bank independence and inflation: Some more bad news. *Applied Financial Economics Letters*, *1*, 381–385.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101.

Bryman, L.& Bell, E. (2011). *Business research methods* (3rd ed.). Oxford: Oxford University Press.

Bua, G., Pradelli, J., & Presbitero, F. A. (2014). Domestic public debt in Low-Income Countries: Trends and structure. *Review of Development Finance, 4,* 1–19.

Calvo, G. A. (1983). Staggered prices in a utility-maximizing framework. *Journal of monetary Economics*, *12*(3), 383-398.

Campillo, M., & Miron, J. A. (1997). Why does inflation differ across countries? In C.D. Romer & D.H. Romer (Eds.), *Reducing inflation: Motivation and strategy*, (pp. 335-357). Chicago: University of Chicago Press.

Central Bank of The Gambia (2008). *Annual Report 2008.* Banjul: Central Bank of The Gambia.

Central Bank of Kenya (2018). *The impact of interest rate capping on the Kenyan economy.* Nairobi: Central Bank of Kenya. Retrieved from https://www.centralbank.go.ke/wpcontent/uploads/2018/03/Interest.cnral bank transparency and central bank communication.

Centre for Policy Analysis (2012). *An examination of the determinants of interest rate spreads in Ghana*. CEPA, Accra. Retrieved from docplayer.net/41497978-An-examination-of-the-determinants-of.

Checetti, S. (1999), legal structure, financial structure, and the monetary policy transmission mechanism, *Federal Reserve Bank of New York Economic Policy Review, 5*(2), 9-28.

Chortareas, G., Stasavmage D., & Sterne, G. (2002). Does it pay to be transparent? International evidence from central bank forecasts. *Federal Reserve Bank of St. Louis Review*, *84*, 99-118.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches* (4th ed.). Thousand Oaks, California: SAGE Publications.

Christensen, J., (2005). Domestic debt markets in Sub-Saharan Africa. *IMF Staff Papers, 52* (3), 518–538.

Christiano, J. L. & Fitzgerald, T. J. (2000). *Understanding the fiscal theory of the price level*. National Bureau of Economic Research, Working Paper No. 7668. Retrieved from http://www.nber.org/papers/ 668pdf.

Christiano, L. J., & Eichenbaum, M. (1992). Liquidity effects and the monetary transmission mechanism. *American Economic Review*, *82*(2), 346-53.

Chuku, C. A. (2014). Monetary and fiscal policy interactions in Nigeria: An application of a state-space model with Markov-switching. *CBN Journal of Applied Statistics*, *1*(1), 39-51.

Chuku, A. C. (2009). Measuring the effects of monetary policy innovations in Nigeria: Structural Vector Autoregressive (SVAR) approach. *African Journal of Accounting, Economics, Finance and Banking Research*, *5* (5), 112-129.

Clarida, R., Gali, J., & Gertler, M. (2000). Monetary policy rules and macroeconomic stability: Evidence and some theory. *Quarterly Journal of Economics, 115*, 147-80.

Cochrane, J. H. (1998). A frictionless view of US inflation. *NBER Macroeconomics Annual*, *13*, 323-384.

Cochrane, J.H. (2001). Long-term debt and optimal price level. *Econometrica, 69*(1), 69-116.

Cukierman, A. (2009). The limits of transparency. *Economic Notes*, *38*(1-2), 137.

Cukierman, A. (1992) *Central bank strategy, credibility and independence*. Cambridge, MA: MIT Press.

Cukierman, A., Webb, S. B., & Neyapti, B. (1992). Measuring the independence of central banks and its effect on policy outcomes. *The World Bank Economic Review, 6*(3), 353-98.

Dabla-Norris, E., & Floerkemeier, H. (2006). *Transmission mechanisms of monetary policy in Armenia: Evidence from VAR analysis*. IMF Working Paper WP/06/248. Washington DC: international Monetary Fund. Retrieved from www.imf.org/exter nal/pubs/ft/wp/2006/wp0pdf.

Dahiru, H., & Sulong, Z. (2017). The determinants of inflation in Nigeria from 1970-2014. *World Applied Sciences Journal*, *35*(10), 2202-2214.

Davoodi, R. H., Dixit, S., & Pinter, G. (2013). *Monetary transmission mechanism in the East African community: An empirical investigation*. IMF Working Paper No. WP/13/39. Retrieved from https://www. imf.org/en/Publications/WP/Issues/2016/12/31/Monetary-ransmission Mechanism-in-the-East-African-Community-AEmpiricalInvestigation.

De Haan, J., & Oosterloo, S. (2006). Transparency and accountability of central banks in their role of financial stability supervisor in OECD countries. *European Journal of Law and Economics, 22*(3), 255–271.

De Haan, J., Eijffinger S. C.W. & Rybiński, K. (2007). Central bank transparency and central bank communication: Editorial introduction *European Journal of Political Economy,* 23, 1–8

Debelle, G., & Fischer, S. (1995). How independent should a central bank be? In J.C. Fuhrer (Ed.), *Goals, guidelines, and constraints facing monetary policymakers* (pp. 195-221). Boston: Federal Reserve Bank of Boston.

Denton, F. T. (1971). Adjustment of Monthly or quarterly series to annual totals: An approach based on quadratic minimization. *Journal of the American Statistical Association, 66*(333), 99-102.

Durevall, D., Loening, J. L., & Birru, Y. A. (2013). Inflation dynamics and food prices in Ethiopia. *Journal of Development Economics*, *104*, 89-106.

Egbuna, E., Ahortor, C. R., Umo, M. D., Mansaray, K., Omolehinwa, L., & Woobay, Y. (2014). An empirical analysis of the transparency of monetary policy in the West African Monetary Zone. *International Journal of Economics, Commerce and Management, 2*(11), 1-29.

Ehrmann, M. (2000). Comparing monetary policy transmission across European countries. *Weltwirtschaftliches Archiv, 136*(1), 58-83.

Ehrmann, M., Eijffinger, S. & Fratzscher, M. (2010). *The role of central bank transparency for guiding private sector forecasts.* ECB working paper series no 1146 /January 2010-41. Retrieved from https://www.ec b.eur opa.eu/pub /pdf /scpwps /ecbwp1146.pdf?

Eichenbaum, M. (1992). Comments on interpreting the macroeconomic time series facts: The effects of monetary policy. *European Economic Review, 36*, 1001-1011.

Eijffinger, S. C., & Hoeberichts, M. (2002). Central bank accountability and transparency: Theory and some evidence. *International Finance*, *5*(1), 73-96.

Eijffinger, S. C.W. & Geraats, P. M. (2006). How transparent are central banks? *European Journal of Political Economy, 22*, 1 –21

Ekor, M., Adeniyi, O. & Saka, J. (2013). Central *bank communication and monetary policy effectiveness: empirical evidence from Nigeria*. Retrieved from https://mpra.ub.unimuenc hen.de/82630/1/MPRA_ pdf.

Fialho, M. L., & Portugal, M. S. (2005). Monetary and fiscal policy interactions in Brazil: An application of the fiscal theory of the price level. *Estudos Econômicos*, *35*(4), 657-685.

Fischer, S. (2015). *Central bank independence*. Paper presented at the Herbert Stein Memorial Lecture National Economists Club. 9th November, 2015. Washington D.C., USA. Retrieved from https://www.fe deralr ese rve.gov/n ew sv ents/speech/fischer20151104a.htm.

Fischer, S. (1995). Central-bank independence revisited. *American Economic Review*, 85, 201-206.

Forder, J. (1996). On the assessment and implementation of 'institutional' remedies. *Oxford Economic Papers,* 48, 39–51.

Friedman, M. (1970). *The counter-revolution in monetary theory*. London: The Institute of Economic Affairs. Retrieved from https://milt on fried man.hoover.org/friedman_images/Collections/2016c21/IEA_1970.pdf.

Fry, M. J. (1998). Assessing central bank independence in developing countries: Do actions speak louder than words? *Oxford Economic Papers*, *50*(3), 512-529.

Fuhrer, C. J. (1997). Central bank independence and inflation targeting: Monetary policy paradigms for the next millennium? *New England Economic Review*, *19*, 19-36.

Fwangkwal, P. M. (2014). *Monetary integration in the ECOWAS*. CBN of Nigeria understanding monetary policy series no. 37. Abuja: Central Bank of Nigeria. Retrieved from https://www.cbn.go v.ng/out/20 16 /mpd/understandingpercent20monetarypercent20plicypercent20seriesp ercent20no per cent2037.pdf.

Garriga, (2016). Central bank independence in the World: A new data set. *International Interactions, 42*(5), 849-868.

Geraats, M. P. (2002). Central bank transparency. *Economic Journal, 112*, 532-565.

Geraats, P. M. (2007). *Political pressures and monetary mystique*. CESifo Working Paper Series, No. 1999. Retrieved from https://pape rs.ssrn.co m/sol3/papers .cfm?abstract_id=993010.

Geraats, P. M. (undated). *Accountability, transparency and oversight.* (Issues in the Governance of Central Banks, BIS). Retrieved from https:/ /www.bis.org/publ/ othp04_7.pdf.

Gospodinov, N, Herrera, A. M., & Pesavento, E. (2013). Unit roots, cointegration and pretesting in VAR models. In T. B. Fomby, L. Kilian & A. Murphy (Eds.), *VAR models in macroeconomics–new developments and applications: Essays in honor of Christopher A. Sims* (Advances in Econometrics, Vol. 32 (pp.81-115). Atlanta: Emerald Group Publishing Limited.

Grilli, V., Masciandaro, D., & Tabellini, G. (1991). Political and monetary institutions and public financial policies in the industrial countries. *Economic Policy*, *6*(13), 341-392.

Hanif, N. M., & Arby M. F. (2008). *Monetary and fiscal policy coordination*. MPRA Paper No. 10307 Retrieved from https://mpra.ub. Unimuenche

Harvey, S. K. & Cushing, M. J. (2014). Separating monetary and structural causes of inflation. *Journal of Finance and Economics, 2*(3), 16-30.

Hasan, A. & Isgut, A. (2009*). Effective coordination of monetary and fiscal policies: Conceptual issues and experiences of selected Asia Pacific countries*. Paper presented at United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)'s Regional High-Level Workshop on "strengthening the response to the global financial crisis in Asia-Pacific: The role of monetary, fiscal and external debt policies. 27th–30th July 2009. Dhaka, Bangladesh. Retrieved from mcite seerx.ist .psu.edu/viewdoc/download?doi=10.1.

Heintz, J., & Ndikumana, L. (2011). Is there a case for formal inflation targeting in Sub-Saharan Africa? *Journal of African Economies, 20*(2), 67-103.

Hielscher, K., & Markwardt, G. (2012). The role of political institutions for the effectiveness of central bank independence. *European Journal of Political Economy,* 28, 286–301.

Im, K.S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Economics, 115*, 53-74.

International Monetary Fund (2010). *Monetary Policy Effectiveness in Sub-Saharan Africa*. IMF Regional Economic Outlook, Sub-Saharan Africa. Retrieved from https://www.el ibrary.imf.org/abstract/IM F086 /10687.../10687.../ch02.x.

Issing, O. (2006). Central bank independence - economic and political dimensions. *National Institute Economic Review, 196*, 66-76.

Itsede, C O. (2003). *The challenges of establishing the second Monetary Zone in West Africa*. Paper presented at the 5th Central Bank of Nigeria seminar on proposed second West African Monetary Zone (WAMZ). Retrieved from www.cbn.gov.ng/out/publications/guidelines/pid/2004.

Jácome, L. I., & Vázquez, F. (2008). Is there any link between legal central bank independence and inflation? Evidence from Latin America and the Caribbean. *European Journal of Political Economy, 24*, 788–801.

Javid, M. & Munir, K. (2010). The price puzzle and monetary policy transmission mechanism in Pakistan: Structural Vector Autoregressive approach. *The Pakistan Development Review, 49*(4), 449-460.

Kamati, R. (2014). *Monetary policy transmission mechanism and interest rate spreads*. PhD Thesis. University of Glasgow.

Kao, C., & Chiang, M.-H. (2000). On the estimation and inference of a cointegrated regression in panel data. In B. H. Baltagi, T. B. Fomby & R. C. Hill (Eds.), *Advances in econometrics: Nonstationary panels, panel cointegration and dynamic panel*s, Vol. 15 (pp. 179–222). Bingley, United Kingdon: Emerald Group Publishing Limited.

Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of Econometrics, 90*(1), 1-44.

Kasseeah, H., Weng, J.M.F. & Moheeput, K.P. (2011). Central bank independence: Evidence from Africa. *Journal of Emerging Trends in Economics and Management Sciences*, *2*(4), 325-332.

Kedan, D., & Stuart, R. (2014) Central Bank Communications: A Comparative Study. *Central Bank of Ireland Quarterly Bulletin of Articles,* (2), 89-104.

Keynes, J. M. (1936). *The general theory of employment, interest and money*. New York: Harcourt Brace.

Kim, S., & Roubini, N. (2000). Exchange rate anomalies in industrial countries: A solution with structural VAR Approach. *Journal of Monetary Economics,* 45, 561-586

Klomp, J., & De Haan, J. (2010). Central bank independence and inflation revisited. *Public Choice*, *144* (3), 445-457.

Kovanen, A. (2011). Monetary policy transmission in Ghana: Does the interest rate channel work? *IMF Working Paper No. 11/275*. Washington DC: International Monetary Fund. Retrieved from https://www.imf.org/external /pubs/ft/wp/2011/wp11275.pdf.

Krušec, D. (2011). Is Inflation targeting effective? *Eastern European Economics*, *49*, (1), 52–71.

Kwakye, K. J. (2013). *Five years of inflation targeting in Ghana: What has changed and what needs to change further to enhance the process*? The Institute of Economic Affairs, Vol. 20 No.1, Accra, Ghana: IEA.

Kwakye, J.K. (2012). *Key issues in the choice of appropriate monetary policy framework for Ghana*. The Institute of Economic Affairs Paper, No. 32. Accra, Ghana: IEA.

Kwakye, K. J. (2011). *The problem of high interest rates: Don't control but please regulate*. The Institute of Economic Affairs, Vol. 19 No.1, Accra, Ghana: IEA.

Kwon, G., McFarlane, L., & Robinson, W. (2009). Public debt, money supply, and inflation: A cross-country study. *IMF Staff Papers, 56*(3), 476-515.

Kydland, F., & Prescott, D. (1977). Rules rather than discretion: The inconsistency of Optimal plans. *Journal of Political Economy, 85* (3), 473-90.

Kyereboah-Coleman, A. (2012). Inflation targeting and inflation management in Ghana. *Journal of Financial Economics Policy, 4,* 25-40.

Labus, M., & Labus, M. (2017). Monetary transmission channels in DSGE models: Decomposition of impulse response functions approach. *Computational Economics*, 1-24.

Laurens, B, & De la Piedra, H., (1998). *Coordination of monetary and fiscal policies*. IMF Working Paper No. 98/25, Washington: International Monetary Fund. Retrieved from https://www. imf.org/exteral/u b s/pdf.

Leeper, E. (1991). Equilibria under 'active' and 'passive' monetary and fiscal policies. *Journal of Monetary Economics, 27* (1), 129-147.

Leeper, E. M., Sims, C. A. & Zha, T. (1996). What does monetary policy do? *Brookings Papers on Economic Activity,* (2) 1-78.

Leu, S. C. Y. (2011). A New Keynesian SVAR model of the Australian economy. *Economic Modelling*, *28*(1-2), 157-168.

Levin, M. (1988). Science: Caring new world: Feminism and science. *The American Scholar*, *57*(1), 100-106.

Loayza, N., & Schmidt-Hebbel, K. (2002). *Monetary policy functions and transmission mechanisms*: *An overview*. Retrieved from https://ideas. repec.org/h/chb/bcchsb/v04c01pp001020.

Loloh, W. F. (2014). *Exchange rate pass-through in Ghana*. Bank of Ghana Working Paper No.WP/BOG-2014/03.Retrievedfrom https: //www. bog.gov.gh /index.php?option=com_content&view=article&..

London, A. (1989). Money, inflation, and adjustment policy in Africa: Some further evidence. *African Development Review, 1*(1), 87-111.

MacKinnon, J., Haug, A., & Michelis, L. (1999). Numerical distribution functions of likelihood ratio tests for cointegration. *Journal of Applied Econometrics, 14*, 563-577.

Maddala, G. S., & Wu, S. (1999). A Comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics, 61*,631–652.

Mallick, S. K., & Sousa, R. (2011). Real effects of monetary policy in large emerging economies. *Macroeconomic Dynamics*, 16 (2), 190–212.

Masson, P. R., Savastano, M. A., & Sharma, S. (1997). *The scope for inflation targeting in developing countries*. Working paper WP/97/130. Washington, D.C.: International Monetary Fund.

Mbutor, O. M. (2009). The dominant channels of monetary policy transmission in Nigeria. An empirical investigation. *CBN Economic and Financial Review, 47*(1), 45-68.

McCallum, B. T. (2012). *The role of money in New-Keynesian models.* Paper presented at the Central Bank of Peru on the Celebrations for the 90th Anniversary of the Central Bank. 5th October, 2012. Lima, Peru,

McCallum, T. B. (1995). Two fallacies concerning central-bank independence. *The American Economic Review, 85* (2), 207-211.

McCallum, B., & Nelson, E. (2000). Monetary policy for an open economy: An alternative framework with optimising agents and sticky prices. *Oxford Review of Economic Policy, 16* (4), 74–91.

McCallum, B., & Nelson, E. (1999). Nominal income targeting in an open economy optimising model. *Journal of Monetary Economics, 43*, 553-578.

Mishkin, F. (2004). Can Central bank transparency go too far? In C. Kent and S. Guttman (Eds), *The future of inflation targeting* (pp. 48–65). Sydney, Australia: Reserve Bank of Australia.

Mishkin, F. S. (1995). Symposium on the monetary transmission mechanism. *Journal of Economic Perspectives*, *9*(4), 3-10.

Mishkin, F. S., & Savastano, M. A. (2001). Monetary policy strategies for Latin America. *Journal of Development Economics, 66,* 415-444.

Mishra, P., & Montiel, P. J. (2013). How effective is monetary transmission in low-income countries? A survey of the empirical evidence. *Economic Systems, 37*(2), 187–216.

Mishra, P. Montiel, P. J., & Sengupta, R. (2016). *Monetary transmission in developing countries: Evidence from India*. IMF Working Paper No. m WP/16/167. Retrieved fromhttps://www.im f.org/external/pu bs/ft/wp/ 2016/wp16167.pdf.

Mishra, P., Montiel, P. J., & Spilimbergo, A. (2012). Monetary transmission in low-lncome countries. *IMF Economic Review, 60*, 270–302.

Mishra, P., Montiel, P. J., Pedroni, P., & Spilimbergo, A. (2014). Monetary policy and bank lending rates in low-income countries: Heterogeneous panel estimates. *Journal of Development Economics, 111*, 117–131.

Mordi, C.O.N. & Amoo, B.A.G. (2014). *Effects of monetary policy on the real economy in Nigeria-A disaggregated analysis*. CBN Occasional Paper No 54. Retrieved from www.cbn.gov.ng.

Montiel, P. J. (2013). *The monetary transmission mechanism in Uganda*. International Growth Centre Working Paper No. S-43002-UGA-1. Retrieved from https://www.theigc.org/wp content/upl oads/2013/03/ Montiel-2013.

Montiel, P., Adam, C., Mbowe, W., & O'Connell, S. (2012). *Financial architecture and the monetary transmission mechanism in Tanzania*. Centre for the Study of African Economies Working Paper WPS/2012-03. Retrieved from https://ideas.repec.org/p/csa/wpaper/2012-03.html.

Mugume, A. (2011). Monetary transmission mechanisms in Uganda. *The Bank of Uganda Journal, 4*(1), 3-57.

Naghdaliyev, N. S. (2011). *Central banks' communication in the post crisis period.* Retrieved from https://www.ucis.pitt.edu/nceeer/Research_M PE M.pdf on 14/06/2016.

Neuenkirch, M. (2012). Managing financial market expectations: The role of central bank transparency and central bank communication. *European Journal of Political Economy, 28*(1), 1-13.

Ngalawa, H., & Viegi, N. (2011). Dynamic effects of monetary policy shocks in Malawi. *South African Journal of Economics, 79*(3), 224-250.

Nguyen V. B. (2016). The relationship between public debt and inflation in developing countries: empirical evidence based on difference panel GMM. *Asian Economic and Social Society, 5*(9), 102-116.

Nnanna, O. J. (2001). *Monetary policy framework in Africa: The Nigerian experience*. Paper presented at South African Reserve Bank Conference. July 2001. Johannesburg, South Africa. Retrieved from https://scholar.google.com/citations?user=V13tVcsAAAAJ&hl=e#d

Obstfeld, M., & Rogoff, K. (1995). The mirage of fixed exchange rates, *Journal of Economic Perspectives, 9*(4), 73–96.

Ogun, T. P., & Akinlo, A. E. (2010). The effectiveness of bank credit channel of monetary policy transmission: The Nigerian experience. *African Economic and Business Review, 8* (2), 15-29.

Ogunkola, O. E., & Tarawalie, A. B., (2008). *Monetary policy transmission mechanism in Sierra Leone: A Vector Error Correction Approach*. CEAR occasional paper No. 2008–03.

Ononugbo, C. M. (2012). *Monetary policy in developing countries: The case of Nigeria*. PhD. Thesis. The University of Leeds.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). London: Sage Publications Inc.

Patton, M. Q. (2001). Qualitative research and evaluation methods (3rd ed.). Thousand Oaks, CA: Sage Publications Inc.

Patton, M.Q. (1990). *Qualitative evaluation and research* methods (2nd ed.). Newbury Park, CA: Sage Publications Inc.

Peersman, G. & Smets, F. (2001). *The monetary transmission mechanism in the euro area: More evidence from VAR analysis*. European Central Bank Working Paper 91. Retrieved from https://www.ecb.eu ropa. Eu /pu b/pdf/scpwps/ecb.pdf?.

Pham, A. T. (2016). *Monetary policies and the macroeconomic performance of Vietnam*. PhD Thesis. Queensland University of Technology.

Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika, 75*(2), 335-346.

Polillo S., & Guillen, M (2005). Globalisation pressures and the state: The worldwide spread of central bank independence. *American Journal of Sociology, 110*(6), 1764-1802.

Posen, A. (1995). Declarations are not enough: Financial sector sources of central bank Independence. *NBER Macroeconomics Annual, 10, 253-274.*

Quartey, P., & Afful-Mensah, G. (2014). Financial and monetary policies in Ghana: A review of recent trends. *Review of Development Finance 4*, 115–125.

Rafiq, M. S., & Mallick, S. K. (2008). The effect of monetary policy on output in EMU3: A sign restriction approach. *Journal of Macroeconomics, 30,* 1756-1791.

Robson, C. (2002). *Real world research: A resource for social scientists and practitioner-researchers* (2nd ed.). Oxford, United Kingdom: Blackwell Publishers.

Rogoff, K. (1985). The optimal degree of commitment to an intermediate monetary get. *Quarterly Journal of Economic,* 110, 1169-90.

Ruane, L., & Wallace, E. (2013). Generation Y females online: Insights from brand narratives. *Qualitative Market Research: An International Journal*, *16*(3), 315-335.

Rubin, H. J., & Rubin, I. S. (2012). *Qualitative interviewing: The art of hearing data* (3 rd ed.). London, United Kingdom: Sage Publications, Inc.

Sakyi, D., Osei Mensah, I., & Obeng, S. K. (2017). Inflation targeting framework and interest rates transmission in Ghana: An empirical investigation. *Journal of African Business, 18(4), 417-434.*

Sargent, T., & Wallace, N. (1981). Some unpleasant monetarist arithmetic. *Federal Reserve Bank of Minneapolis Quarterly Review, 5,* 1-17.

Siklos, P. L. (2003). Assessing the impact of changes in transparency and accountability at the Bank of Canada. *Canadian Public Policy, 29*(3). 279-299.

Sims, C. A. (2006). *Comment on Del Negro, Schorfheide, Smets and Wouters*. Retrieved from sims.princeton.edu/yDSSW8 06/DSseatt leComm pdf.

Sims, C. (1994). A simple model for the study on the determination of the price level and the interaction of monetary and fiscal policy. *Economic Theory, 4* (3), 381-399.

Sims, C. (1980). Macroeconomics and reality. *Econometrica 48*(1), 1–48.

Sims C. A., Stock J. H., & Watson, M. W. (1990). Inference in linear time series models with some unit roots. *Econometrica, 58*(1), 113-144.

Sims, C. A., & Zha, T. (2006). Were there regime switches in US monetary policy? *American Economic Review, 96*(1), 54-81.

Sims, C. A., & Zha, Tao. (1998). Bayesian methods for dynamic multivariate models. *International Economic Review*, *39*(4), 949-68.

Sims, C.A., Zha, T., (1995). *Does monetary policy generate recessions? Using less aggregate price data to identify monetary policy*. Working Paper No.782, Yale University, CT.

Soyibo, A. (1998). International payments system: West Africa 'common currency'. Is it possible or necessary? A presentation at a workshop on international payments system within ECOWAS Countries. 30th – 31st March, 1998. Accra, Ghana.

Starr, M. (2005). Does money matter in the CIS? Effects of monetary policy on output and prices. *Journal of Comparative Economics*, (33) 441-461.

Stock, J. H., & Watson, M. W. (1993). A simple estimator of cointegration vectors in higher order integrated systems, *Econometrica, 61*, 783-820.

Strongin, S. (1995). The identification of monetary policy disturbances: Explaining the liquidity puzzle. *Journal of Monetary Economics, 35*, 463-497.

Tarawalie, A. B., Sissoho, M., Conte, M., & Ahortor, R. C. (2013). *Fiscal andmonetary policy coordination in the WAMZ: Implications formemberstates' erformance on the convergence criteria.* WAMI Occasional Paper Series Vol. 1, No.4. Retrieved from https: //www. researchgate.net/..Fiscal_andMonetary_Policycoordinpdf.

Tarawalie, A. B., Sissoho, M., Conte, M., & Ahortor, R. C. (2012). *Exchange rate, inflation and macroeconomic performance in the WAMZ.* WAMI Occasional Paper Series No.2. Retrieved from www.wami imao.org/.../OccassionalPapers/WAMI%20OCCASIONAL%20PAP.

Taylor, J. B. (1995). The monetary transmission mechanism: An empirical framework. *Journal of Economic Perspectives, 9*(4), 11-26.

Taylor, J. B. (1993). Discretion versus policy rules in practice. *Carnegie Rochester Conference Series on Public Policy*, 39, 195-214.

Thornton, J. (2008). Money, output and inflation in African economies. *South African Journal of Economics*, *76*(3), 356-366.

Torsten, P., & Tabellini, G. (1993). Designing institutions for monetary stability. *Carnegie Rochester Conference Series on Public Policy, 39,* 53-84.

Touray, S. (2013). *Monetary policy effectiveness and transmission mechanism: The case of The Gambia.* M.A. Thesis. The University of Edinburgh.

Tovar, C. E. (2009). DSGE models and central banks. *Economics: Open Assessment E-Journal, 3,* 1–30.

Walsh, C. E. (2003). Accountability, transparency, and inflation targeting. *Journal of Money, Credit and Banking, 35* (5), 829-849.

Walsh, C. (1995). Optimal contracts for central bankers. *The American Economic Review, 85*(1), 150-167.

Walsham, G. (1995). The emergence of interpretivism in IS Research. *Information Systems Research 6*(4):376-394.

West African Monetary Institute (2015). *Annual report and statement of accounts*. Accra: WAMI. Retrieved from http://www.wami-imao.org/?q=annualreport.

West African Monetary Institute (2014). *Annual report and statement of accounts*. Accra: WAMI. Retrieved from http://www.wami-imao.org/?q=annualreport.

West African Monetary Institute (2011). *Annual report and statement of accounts*. Accra: WAMI. Retrieved from http://www.wami-imao.org/?q=annualreport.

West African Monetary Institute (undated). *West African Monetary Institute Strategic Plan 2010-2015*. Accra: WAMI. Retrieved from http://www.wamiimao.org/sites/default/files/Strategic/WAMI_STRA EGIC_PLAN_2010_ 2015-PDF.pdf.

Weber, C. S. (2018). Central bank transparency and inflation (volatility)–new evidence. *International Economics and Economic Policy, 15*(1), 21-67.

Woodford, M. (2005, August). *Central bank communication and policy effectiveness.* Paper presented at the Federal Reserve Bank of Kansas City Symposium on Greenspan Era: Lessons for the Future, Wyoming, USA.

Woodford, M. (2001). Fiscal requirements for price stability. *Journal of Money, Credit and Banking, 33* (3), 669-728.

Woodford, M. (1998). *Public debt and the price level*. Unpublished manuscript.

Woodford, M. (1995). Price level determinacy without control of monetary aggregate. *Carnegie-Rochester Conference Series on Public Policy, 43*(1), 1-46.

Woodford, M. (1994). Monetary policy and price level determinacy in a cash in advance economy. *Economic Theory, 4* (3), 345-380.

APPENDICES

A: Macroeconomic Convergence Criteria Performance by the WAMZ Countries

Year	Ghana FD	Ghana CBF	Ghana ER	Nigeria FD	Nigeria CBF	Nigeria ER	Gambia FD	Gambia CBF	Gambia ER	Sierra Leone FD	Sierra Leone CBF	Sierra Leone ER	Guinea FD	Guinea CBF	Guinea ER
2001	-13	0.0	1.4	-3.2	0.0	8.9	-10.0	30.7	8.2	-16.5	0.0	2.4	-5.2	9.9	4.4
2002	-8.3	12.1	2.7	-3.9	0.0	6.2	-9.1	76.1	5.2	-11.7	-5.8	2.7	-8.0	27.1	3.7
2003	-7.5	0.0	5	-2.0	37.6	4.9	-7.6	63.1	4.6	-10.0	24.3	1.7	-10.4	16.1	1.8
2004	-8.1	27.7	4.6	-1.2	0.0	11.6	-8.6	0.0	5.0	-8.6	0.0	3.8	-5.9	23.1	1.1
2005	-6.9	0.0	4	-1.3	0.0	11	-7.4	0.0	5.2	-9.6	0.0	4.0	-0.8	-0.4	0.9
2006	-7.0	0.0	3.7	-0.6	0.0	17.3	-2.7	0.0	6.4	-8.5	17.9	4.2	-1.8	81.6	0.6
2007	-9.5	0.0	3.9	-0.6	0.0	14.8	-1.0	0.0	6.5	-5.0	0.0	5.3	-0.5	-1.1	0.4
2008	-12	38.7	2.2	-0.2	0.0	17.2	-3.3	0.0	4.4	-7.9	0.3	4.3	-1.7	16.6	2.2
2009	-7.9	0.0	4.1	3.3	0.0	16.6	-7.2	0.0	4.7	-10.4	17.3	6.2	-6.9	40.1	1.9
2010	-9.1	0.0	4.6	3.1	0.0	7.9	-6.7	0.0	6.8	-14.1	25.7	5.0	-14.3	82.9	4.3
2011	-3.2	0.0	3.7	-1.1	0.0	6.3	-9.0	0.0	6.1	-9.9	1.1	2.5	-4.6	-17.0	3.0
2012	-7.3	0.0	3.2	1.4	0.0	8.5	-13.5	0.0	4.8	-7.9	-8.1	3.4	-5.4	-51.8	3.5
2013	-8.1	0.0	3.0	1.4	0.0	8.9	-11.0	48.3	4.6	-4.1	-4.1	3.2	-7.1	-52.0	3.5
2014	-7.1	0.0	3.1	0.9	0.0	6.5	-12.5	33.3	3.7	-7.6	7.6	4.3	-6.2	-52.0	3.5

Note: FD is Fiscal Deficit, CBF is Central Financing of Fiscal Deficit as a percentage of Previous Year's Tax Revenue, and ER is External Reserve (3 months of import cover).
Source: WAMI, 2016.

B: Profile of Respondents

Name	Rank/Qualification	Area of Specialization	Place of Work
Interviewee (C)	A retired Professor in Economics/ PhD in Economics	Public Sector Economics & Financial Development	University of Ghana
Interviewee (B)	Associate Professor/ PhD in Economics	Development and Small Business Financing, Monetary Economics, Sustainable Development, Poverty Reduction and Progress towards the MDGs	University of Ghana
Interviewee (A)	Senior Research Fellow/ PhD in Economics	Labour Economics, Public Policy & Financial Markets	IGC, University of Ghana
Interviewee (D)	A retired Professor in Economics/ PhD in Economics	Monetary Economics	University of Ghana
Interviewee (E)	Senior Economist, CEPA/ PhD in Economics	Public Sector Economics Monetary Economics	Centre for Economic Policy Affairs (CEPA), Ghana
Interviewee (F)	PhD in Economics	Public Sector Economics Financial Market Development	Chartered Institute of Bankers (GH) Legon, Ghana
Interviewee (G)	Senior Economist/ PhD in Economics	Development Economics	Ministry of Finance (MoF), Ghana
Interviewee (H)	Research Fellow, BoG/PhD in Economics	Monetary Economics, Development Economics	Bank of Ghana

Source: Author (2018)

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C: ADF and PP Unit Root Tests for Ghana

	ADF Test		PP Test	
Variable	Intercept	Intercept and trend	Intercept	Intercept and trend
CEA	-0.59	-2.49	-0.62	-5.69***
ΔCEA	-14.28***	-14.24***	-24.34***	
P	-2.34	-2.97	-4.48	-2.15
ΔP	-3.77***	-3.73**	-13.56***	-13.64***
LR	-1.8494	-1.55	-2.02	-1.63
ΔLR	-11.42***	11.47***	-11.45***	-11.48***
PC	-0.66	-1.26	-0.63	-1.40
ΔPC	-11.21***	-11.18***	-11.20***	-11.18***
NER	2.34	0.47	3.46	1.08
ΔNER	-3.48***	-4.85***	-5.10***	-5.84***
PR	-1.80	-0.33	-1.84	-0.79
ΔPR	-6.06***	-6.49***	-12.83***	-13.12***

Note: *** and ** denote 1% and 5% respectively. Lags selected based on SIC

Source: Author (2016).

D: ADF and PP Unit Root Tests for Nigeria

	ADF Tests		PP Test	
Variable	Intercept	Intercept & Trend	Intercept	Intercept & trend
GDP	-1.71	-1.39	-1.34	-1.42
ΔGDP	-3.40**	-4.21***	-2.98**	-3.14
CPI	1.97	-1.18	3.10	-0.77
ΔCPI	-10.30	-10.65***	-10.09***	-10.61***
LR	-1.35	-1.11	-1.58	-1.43
ΔLR	-11.01	-11.02***	-11.07***	-11.07***
PC	-1.36	-0.83	-1.37	-0.92
ΔPC	-18.26	-18.32***	-18.79***	-18.46***
NER	-1.09	-2.49	-1.08	-2.19
ΔNER	-8.31	-8.27***	-8.16***	-8.12***
M0	1.01	-1.43	0.83	-2.37
ΔM0	-10.55	-10.68***	-21.35***	-37.16***

Note: *** and ** denote 1% and 5% respectively. Lags selected based on SIC
Source: Author (2016).

E: ADF and PP Unit Root Tests for The Gambia

	ADF Tests			PP Test	
Variable	Intercept	Intercept & Trend		Intercept	Intercept & trend
GDP	-0.51	-3.50		-0.26	-2.93
ΔGDP	-4.21***	-4.19		-2.87*	-2.83
CPI	-2.41	-1.85		0.05	-1.50
ΔCPI	-6.02***	-0.60***		-8.822***	-8.80***
LR	-2.22	-2.25		-1.95	-1.96
ΔLR	-6.10***	-6.10***		-13.22***	-13.19***
CPS	-0.31	-2.60		-0.48	-3.04
ΔCPS	-15.71***	-15.65***		-15.70	-15.65***
NER	-0.36	-1.07		-0.29	-1.04
ΔNER	-13.59***	-13.57		-13.59	-13.575***
M0	-1.36	-2.09		-1.82	-2.59
ΔM0	-16.53***	-16.52***		-16.77***	-16.83***

Note: *** and ** denote 1% and 5% respectively. Lags selected based on SIC
Source: Author (2016).

F: ADF and PP Unit Root Tests for Sierra Leone

	ADF Tests			PP Test	
Variable	Intercept	Intercept & Trend		Intercept	Intercept & trend
GDPL	-0.76	-2.57		-1.31	-2.37
ΔGDPL	-2.80*	-2.71		-2.51	-2.67
CPI	4.98	-1.66		4.98	-1.66
ΔCPI	-10.07***	-11.86***		-10.40	-11.86***
LR	-1.71	-2.12		-1.83	-2.39
ΔLR	-12.15***	-12.11***		-12.22	-12.19***
PC	-3.39**	0.26		-3.39	0.60
ΔPC	-14.07	-15.22***		-14.06	-15.27***

NER	-0.76	-2.47	-1.96	-3.34*
ΔNER	-4.36***	-4.29***	-8.74	-8.68***
M0	-0.22	-5.88***	0.38	-5.88***
ΔM0	-14.57***	-14.53***	-19.64	-19.62***

Note: *** and ** denote 1% and 5% respectively. Lags selected based on SIC
Source: Author (2016).

G: Panel Unit Root Tests

	F-ADF	F-PP	F-ADF	F-PP
Variable	Constant		Constant and Trend	
GDP	5.66	3.03	21.38**	8.86
ΔGDP	41.89***	18.71**		30.33***
CPI	5.11	19.97	11.24	9.52
ΔCPI	80.71***	94.78***	69.60***	87.40***
LR	9.14	9.21	22.76***	7.17
ΔLR	84.64***	106.88***		88.86***
PC	8.53	10.03	1.88	3.11
ΔPC	51.61***	72.74***	61.45***	71.82***
NER	2.88	4.61	14.00	5.91
ΔNER	80.10***	75.98***	62.47***	59.11***
M0	1.16	1.20	1.99	22.55***
ΔMO	153.23***	163.39***	141.82***	

Note: ***.and ** indicate the rejection of the null hypothesis of non-stationarity at 1% and 5%, level of significance respectively., Δ denote the first difference.
Source: Author (2018).

H: Lag Length Order Selection Criteria for Ghana

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-987.1670	NA	0.039428	13.79399	13.91773	13.84427
1	445.1411	2725.364	1.49e-10	-5.599181	-4.732986*	-5.247208
2	514.3378	125.8996	9.43e-11	-6.060247	-4.451598	-5.406583*
3	556.6232	73.41222*	8.70e-11*	-6.147545*	-3.796443	-5.192190
4	570.5009	22.93671	1.20e-10	-5.840291	-2.746735	-4.583244
5	602.7000	50.53473	1.29e-10	-5.787501	-1.951492	-4.228763
6	634.8327	47.75274	1.40e-10	-5.733788	-1.155326	-3.873359
7	667.6726	46.06711	1.52e-10	-5.689898	-0.368982	-3.527778
8	692.2397	32.41485	1.89e-10	-5.531107	0.532262	-3.067296

Source: Author (2018).

I: Lag Length Order Selection Criteria for Nigeria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	124.8054	NA	9.12e-09	-1.485068	-1.369749	-1.438241
1	1730.197	3070.311	2.76e-17	-21.10246	-20.29523	-20.77467
2	2084.779	651.5439	5.15e-19	-25.08473	-23.58559*	-24.47598
3	2162.803	137.5186	3.06e-19*	-25.61004*	-23.41898	-24.72033*
4	2186.500	39.98735	3.60e-19	-25.45624	-22.57327	-24.28557
5	2201.497	24.18276	4.75e-19	-25.19371	-21.61882	-23.74207
6	2233.899	49.81835	5.07e-19	-25.14873	-20.88193	-23.41613
7	2257.373	34.33109	6.12e-19	-24.99216	-20.03344	-22.97860
8	2294.653	51.72662*	6.27e-19	-25.00817	-19.35754	-22.71364

Source: Author (2018).

J: Lag Length Order Selection Criteria for The Gambia

Lag	LogL	LR	FPE	AIC	SC	HQ
0	361.8856	NA	4.71e-10	-4.448570	-4.333251	-4.401743
1	1930.858	3000.659	2.25e-18	-23.61072	-22.80349	-23.28293
2	2249.201	584.9555	6.60e-20	-27.14001	-25.64086	-26.53126
3	2377.041	225.3181	2.10e-20*	-28.28801*	-26.09695*	-27.39830*
4	2412.880	60.47803*	2.13e-20	-28.28599	-25.40302	-27.11532
5	2430.611	28.59209	2.71e-20	-28.05764	-24.48275	-26.60600
6	2454.832	37.23946	3.21e-20	-27.91040	-23.64360	-26.17780
7	2482.540	40.52242	3.67e-20	-27.80674	-22.84803	-25.79318
8	2509.421	37.29869	4.28e-20	-27.69277	-22.04214	-25.39824

Source: Author (2018).

K: Lag Length Order Selection Criteria for Sierra Leone

Lag	LogL	LR	FPE	AIC	SC	HQ
0	316.4337	NA	8.72e-10	-3.832515	-3.718159	-3.786085
1	2198.462	3601.411	1.10e-19	-26.62298	-25.82250	-26.29797
2	2542.586	633.0196	2.46e-21	-30.42699	-28.94037	-29.82340
3	2661.446	209.8378	8.90e-22	-31.44994	-29.27719*	-30.56777*
4	2710.566	83.08014	7.63e-22*	-31.61192*	-28.75304	-30.45117
5	2741.918	50.70570	8.20e-22	-31.55455	-28.00953	-30.11522
6	2775.023	51.08744*	8.67e-22	-31.51880	-27.28765	-29.80089

Source: Author (2018).

L: Lag Length Order Selection Criteria for WAMZ

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1550.602	NA	0.443675	16.21460	16.31640	16.25583
1	1452.305	5786.850	1.68e-14	-14.69067	-13.97810	-14.40207
2	1627.456	326.5837	3.95e-15	-16.14016	-14.81681	-15.60419
3	1728.839	182.7011	2.00e-15	-16.82124	-14.88710*	-16.03790*
4	1766.089	64.80031	1.99e-15	-16.83426	-14.28935	-15.80355
5	1798.021	53.55178	2.09e-15	-16.79188	-13.63619	-15.51380
6	1860.443	100.7856	1.61e-15	-17.06711	-13.30063	-15.54166
7	1933.610	113.5616*	1.11e-15*	-17.45427*	-13.07701	-15.68145
8	1960.487	40.03497	1.25e-15	-17.35924	-12.37120	-15.33904

Source: Author (2018).

M: LM Serial Correlation Tests for the WAMZ Countries

Country	Lags	LM-Statistic	Prob.
Ghana	1	23.42382	0.9474
	2	33.11986	0.6063
	3	21.99598	0.9679
	4	38.11653	0.3733
Nigeria	1	48.49796	0.0797
	2	46.13872	0.1200
	3	39.95561	0.2987
	4	31.48161	0.6833
The Gambia	1	40.08017	0.2940
	2	48.23751	0.0835
	3	49.68990	0.0641
	4	37.68724	0.3920
Sierra Leone	1	50.86105	0.0513
	2	47.7386	0.0912
	3	26.89410	0.8642
	4	37.09808	0.4182
WAMZ	1	49.67251	0.0643
	2	47.65253	0.0926
	3	48.81940	0.0752
	4	46.47742	0.1134
	5	42.11001	0.2235
	6	45.53241	0.1326
	7	32.50590	0.6356
	8	43.44616	0.1838

Source: Author (2018).

N: Stability Test Condition for Ghana

Stability test
Roots of Characteristic Polynomial
Endogenous variables: CEA P LR PC NER PR
Exogenous variables: C
Lag specification: 1 3
Date: 04/30/18   Time: 05:51

Root	Modulus
0.994697 - 0.015927i	0.994825
0.994697 + 0.015927i	0.994825
0.944248 - 0.112087i	0.950878
0.944248 + 0.112087i	0.950878
0.912079	0.912079
0.812599 - 0.100425i	0.818781
0.812599 + 0.100425i	0.818781
0.682441	0.682441
-0.262800 + 0.601444i	0.656353
-0.262800 - 0.601444i	0.656353
-0.572236	0.572236
0.065110 + 0.439065i	0.443866
0.065110 - 0.439065i	0.443866
-0.389310 - 0.134995i	0.412051
-0.389310 + 0.134995i	0.412051
-0.359502	0.359502
0.058805 - 0.178213i	0.187664
0.058805 + 0.178213i	0.187664

No root lies outside the unit circle.
VAR satisfies the stability condition.

Inverse Roots of AR Characteristic Polynomial

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O: Stability Condition Test for Nigeria

Stability Test
Roots of Characteristic Polynomial
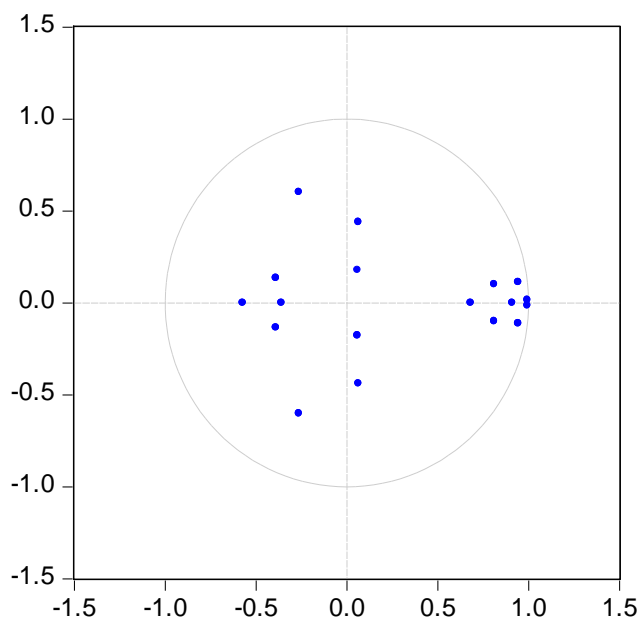Endogenous variables: GDP CPI LR PC NER M0
Exogenous variables: C
Lag specification: 1 3
Date: 04/22/18   Time: 23:26

Root	Modulus
0.993050 - 0.001841i	0.993052
0.993050 + 0.001841i	0.993052
0.962632 - 0.056363i	0.964281
0.962632 + 0.056363i	0.964281
0.936945 - 0.187202i	0.955464
0.936945 + 0.187202i	0.955464
0.701072	0.701072
0.554730 - 0.246769i	0.607142
0.554730 + 0.246769i	0.607142
-0.350922 - 0.311400i	0.469165
-0.350922 + 0.311400i	0.469165
0.180757 - 0.421918i	0.459008
0.180757 + 0.421918i	0.459008
-0.026051 - 0.352772i	0.353733
-0.026051 + 0.352772i	0.353733
0.256397	0.256397
-0.189774 + 0.037783i	0.193498
-0.189774 - 0.037783i	0.193498

No root lies outside the unit circle.
VAR satisfies the stability condition.

Inverse Roots of AR Characteristic Polynomial

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P: Stability Condition Test for The Gambia

Stability Test
Roots of Characteristic Polynomial
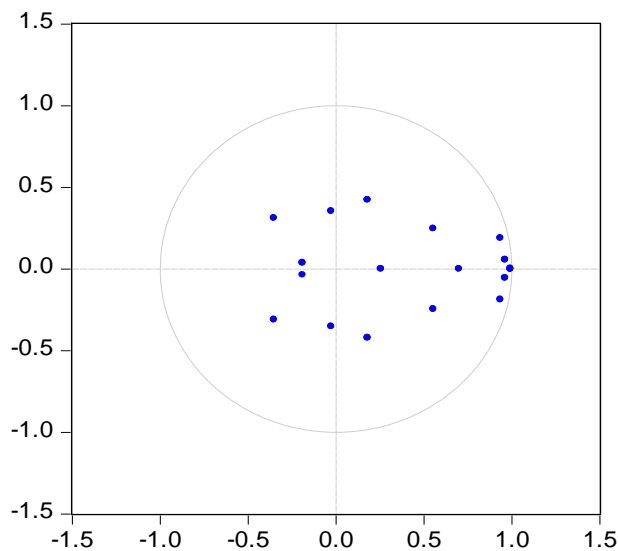Endogenous variables: GDP CPI LR PC NER M0
Exogenous variables: C
Lag specification: 1 3
Date: 04/24/18   Time: 00:24

Root	Modulus
0.993199	0.993199
0.966047 - 0.055132i	0.967619
0.966047 + 0.055132i	0.967619
0.930412 - 0.152771i	0.942871
0.930412 + 0.152771i	0.942871
0.864123 - 0.032552i	0.864736
0.864123 + 0.032552i	0.864736
0.573874 + 0.310106i	0.652301
0.573874 - 0.310106i	0.652301
0.608148 - 0.214966i	0.645023
0.608148 + 0.214966i	0.645023
-0.643120	0.643120
-0.496545	0.496545
-0.394091	0.394091
-0.036650 - 0.304808i	0.307004
-0.036650 + 0.304808i	0.307004
-0.148268	0.148268
0.126971	0.126971

No root lies outside the unit circle.
VAR satisfies the stability condition.

Inverse Roots of AR Characteristic Polynomial

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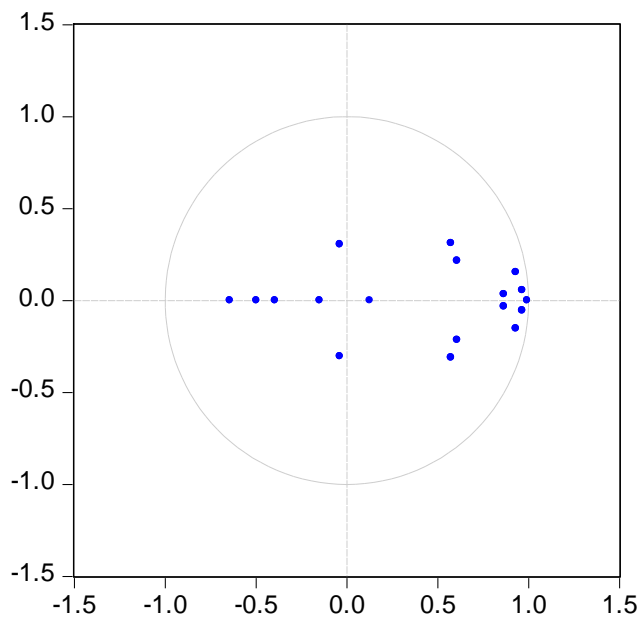
Q: Stability Condition Test for Sierra Leone

Root	Modulus
0.988748 - 0.010213i	0.988801
0.988748 + 0.010213i	0.988801
0.970735 - 0.076814i	0.973769
0.970735 + 0.076814i	0.973769
0.926450 - 0.149066i	0.938366
0.926450 + 0.149066i	0.938366
0.861128	0.861128
0.192854 + 0.631469i	0.660262
0.192854 - 0.631469i	0.660262
0.531168 - 0.260912i	0.591789
0.531168 + 0.260912i	0.591789
0.180172 - 0.484790i	0.517188
0.180172 + 0.484790i	0.517188
-0.447574	0.447574
-0.203707 + 0.195434i	0.282295
-0.203707 - 0.195434i	0.282295
-0.131466 - 0.247336i	0.280105
-0.131466 + 0.247336i	0.280105

No root lies outside the unit circle.
VAR satisfies the stability condition.

Inverse Roots of AR Characteristic Polynomial

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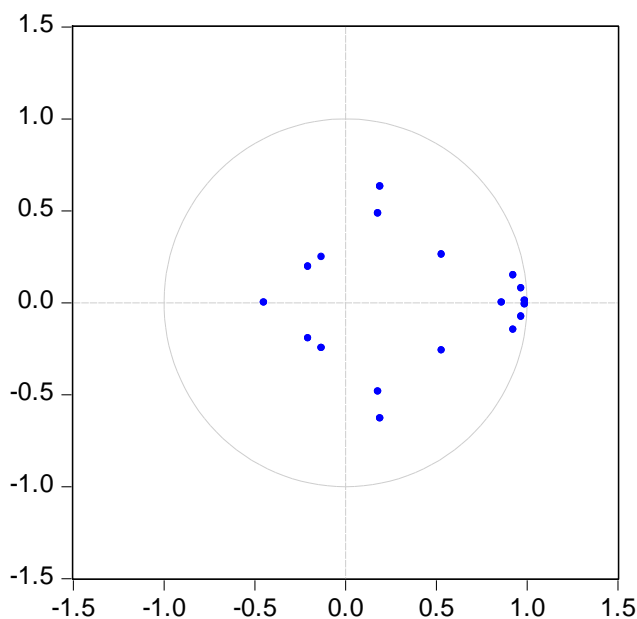
R: Panel Stability Condition Test for the WAMZ Countries

Root	Modulus
0.999896 - 0.000275i	0.999896
0.999896 + 0.000275i	0.999896
0.994588 - 0.015160i	0.994703
0.994588 + 0.015160i	0.994703
0.727463 - 0.417969i	0.838988
0.727463 + 0.417969i	0.838988
0.781926 + 0.181830i	0.802789
0.781926 - 0.181830i	0.802789
0.791470	0.791470
0.096184 - 0.499539i	0.508714
0.096184 + 0.499539i	0.508714
0.420405	0.420405
-0.233878 - 0.339477i	0.412242
-0.233878 + 0.339477i	0.412242
0.082795 - 0.296220i	0.307573
0.082795 + 0.296220i	0.307573
-0.181876 - 0.089593i	0.202746
-0.181876 + 0.089593i	0.202746

No root lies outside the unit circle.
VAR satisfies the stability condition.

Inverse Roots of AR Characteristic Polynomial

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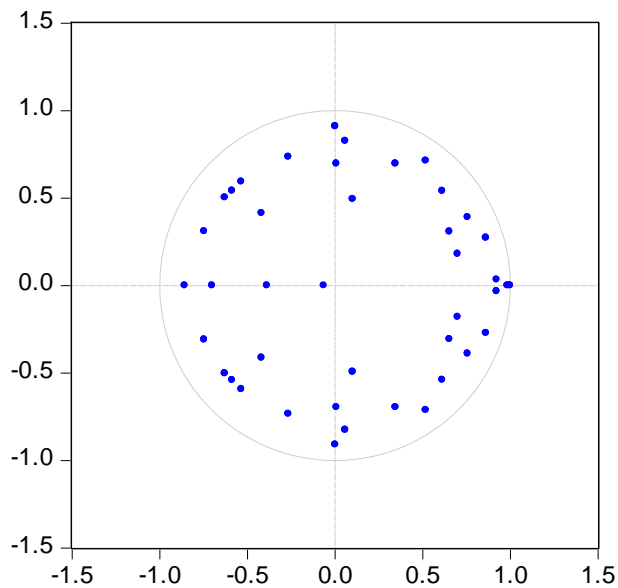
S: Panel Unit Root Test Results

Variable	IPS	F-ADF	F-PP	IPS	F-ADF	F-PP
	With Constant			With Constant and Trend		
GPC	-0.23	13.40	10.18	-0.77	14.75**	4.00
ΔGPC	-3.52***	26.83***	26.36***	-2.37***		19.70***
CPI	1.16	5.95	23.52**	-0.45	9.51	8.52
ΔCPI	-9.78***	94.18***		-9.48***	82.27***	99.35***
DD	1.54	11.77	13.45	-0.73	17.69**	4.46
ΔDD	-2.03**	15.60**	28.12***	-2.81***		24.79***
M2G	8.23***	83.78***	122.43***	-8.26***	74.19***	118.6***
NER	1.79	3.37	4.01	-1.60	17.97**	5.91
ΔNER	-8.53***	79.70***	77.24***	-7.62***		61.19***
WFI	-0.54	7.38	6.55	1.04	2.73	0.31
ΔWFI	-9.91***	96.98***	83.55***	1.04***	2.73***	0.31***

Note: *** and ** denote 1% and 5% rejection of the null hypothesis of non-stationarity. Δ indicates first difference.

Source: Author (2018).

T: Kao Residual Cointegration Test Results

Model	ADF Test Statistic	P rob
Model 1: Equation. 16	-2.341***	(0.0096)
Model 2: Equation 17	-2.648***	(0.0040)

Note: *** denote the rejection of null hypothesis of no cointegration at 1% significance level. Trend Assumption: No deterministic trend, Automatic lag length selection based on SIC. Prob. indicates probability values.
Source: Author (2018).

U: Results of the Johansen-Fisher Panel Cointegration Test

Ho/ No. of CE(s)	r ≤0	r ≤1	r ≤2	r ≤3	Models
Trace Statistics	102.2[a]	43.96[a]	18.71[b]	9.44	
Maximum-Eigen Statistics	72.55[a]	32.53[a]	14.37[c]	7.49	Model 1: Equation 16
Trace Statistics	165.6[a]	87.26[a]	39.51[a]	21.75[a]	
Maximum-Eigen Statistics	119.4[a]	58.15[a]	23.42[b]	13.26	Model 2: Equation 17

Note:[a],[b],[c] denote the rejection of null hypothesis of no cointegration at 1%, 5% and 10% significance level. Trend Assumption: Deterministic trend, Automatic lag length selection based on SIC.

V: Panel FMOLS Coefficient Variance Decomposition for Model 1

Eigenvalues	0.221450	0.143951	0.027339	0.008341	0.001170
Condition	0.005281	0.008125	0.042781	0.140227	1.000000

Variance Decomposition Proportions

	Associated Eigenvalue				
Variable	1	2	3	4	5
WFI	0.001399	0.303501	0.288644	0.358313	0.048143
GPC	0.056384	0.512190	0.414416	0.015847	0.001162
NER	0.020464	0.096327	0.038942	0.728213	0.116054
DD	0.158058	0.801215	0.040287	0.000412	2.87E-05
M2G	0.931641	0.068109	0.000234	1.34E-05	2.12E-06

W: Panel FMOLS Coefficient Variance Decomposition for Model 2

Coefficient Variance Decomposition

Date: 03/07/19   Time: 09:51

Sample: 2001Q1 2015Q4

Included observations: 236

Eigenvalues	0.440466	0.059913	0.004733	0.003502	0.002596	2.36E-06
Condition	5.35E-06	3.93E-05	0.000498	0.000673	0.000907	1.000000

Variance Decomposition Proportions

	Associated Eigenvalue					
Variable	1	2	3	4	5	6
DD	0.999923	4.75E-05	2.45E-06	2.38E-05	3.19E-06	1.97E-13
GPC	0.002093	0.997350	5.22E-05	2.17E-06	0.000503	3.11E-11
NER	0.101382	0.099906	0.379506	0.145042	0.274164	3.07E-09
WFI	0.003769	0.080392	0.250160	0.295324	0.370355	3.99E-09
M2G	0.230111	5.72E-05	0.393012	0.324945	0.004956	0.046918
DD_M2G	0.231749	0.000671	0.414489	0.343344	0.009743	4.00E-06

X: Panel DOLS Coefficient Variance Decomposition for Model 1

Eigenvalues	0.077668	0.019003	0.004073	0.000651	5.59E-06
Condition	7.20E-05	0.000294	0.001372	0.008587	1.000000

Variance Decomposition Proportions

	Associated Eigenvalue				
Variable	1	2	3	4	5
DD	0.968716	0.030144	0.001128	1.29E-05	2.94E-10
GPC	0.331172	0.668119	1.34E-05	0.000695	1.24E-09
NER	0.369331	0.002606	0.606129	0.021934	3.87E-08
WFI	0.022404	0.228830	0.446032	0.302734	9.90E-08
M2G	0.028026	0.001130	0.007746	0.006982	0.956115

Y: Panel DOLS Coefficient Variance Decomposition for Model 2

Coefficient Variance Decomposition

Date: 03/07/19   Time: 09:53

Sample: 2001Q1 2015Q4

Included observations: 240

Eigenvalues	2.335096	0.192950	0.041212	0.010606	0.005495	2.19E-05
Condition	9.37E-06	0.000113	0.000531	0.002062	0.003980	1.000000

Variance Decomposition Proportions

	Associated Eigenvalue					
Variable	1	2	3	4	5	6
DD	0.998834	0.000866	0.000296	4.85E-06	1.88E-08	1.32E-11
GPC	0.120779	0.878770	0.000175	4.80E-07	0.000276	5.82E-10
NER	0.190266	0.019097	0.000320	0.740500	0.049817	5.80E-08
WFI	0.058932	0.175019	0.103433	0.134316	0.528299	7.45E-07
M2GR	0.474686	0.025905	0.458020	0.000484	0.007501	0.033404
DD_M2GR	0.467839	0.008159	0.522276	0.000448	0.001275	2.33E-06

Z: Interview Guide for the Qualitative Study on Ghana

SECTION A

IT REGIME, CENTRAL BANK INDEPENDENCE AND

CREDIBILITY

The primary objective of the Central Bank, according to the Bank of Ghana (BoG) Act 612 (2002) is to maintain price stability independent of instructions from Government or any other authority.

- In your view, how has the independent status of the Central Bank enhanced the conduct of monetary policy in Ghana compared to the monetary targeting regime?

- In your opinion, does the Government's appointees to board of BoG or representatives of Ministry of Finance (MoF) on Monetary Policy Committee affect (weaken) the independence of the Central Bank in the conduct of monetary policy in Ghana?

- If No, explain why you think it does not have any influence on the independence of BoG?

- Does the Government's appointees on the board of BoG or representative of MoF on MPC affect credibility of inflation targeting framework pursued by the Central Bank?

- If Yes, to what extent do the appointees on the board of BoG and representatives of MoF on MPC affect credibility of inflation targeting framework pursued by the Central Bank?

- If No, explain why in your view it does not have any effect on the independence of BoG.

SECTION B

IT Regime and Monetary - Fiscal Policy Coordination

Recent studies have shown that successful IT regimes in emerging economies are supported by a strong commitment by the fiscal authority to lower budget deficit.

- What has been the level of coordination between the fiscal authority and the Central Bank in the pursuit of inflation targeting framework in Ghana?

- In what ways does government borrowing from the domestic market in financing its budget affect the conduct of monetary policy in Ghana?

SECTION C

Central Bank Financing of Gov't Budget and Inflation

Management in Ghana

- In your opinion, how has the Central Bank financing of government budget up to ten per cent (10%) of its previous year's revenue affected inflation management in Ghana?

The provisions in the BoG Act 612 (2002) and Banks and Specialised Deposit-Taking Institutions Act, 2016 (Act 930) allow Central Bank to finance government budget up to five per cent (5%) of its previous years' revenue.

- In your opinion, how is zero-financing of government budget by Central Bank likely to affect the inflation targeting regime if government evokes such provisions after the expiration of Ghana-IMF Extended Credit Facility arrangement/Programme?

- To what extent has the zero financing of government budget by Central Bank strengthened the framework for inflation targeting as well as enhancing credibility of IT in the country?

SECTION D

Transparency and Accountability

Inflation targeting framework is expected to improve the accountability of the Central Bank because it provides an explicit and publicly-known benchmark that must be reached over a specific time frame.

- Comparing monetary targeting regime to inflation targeting regime, do you think IT has improved transparency and accountability of monetary policy process?
- In what ways has inflation targeting framework enhanced transparency and/or accountability of the monetary policy process in Ghana?

SECTION E

Communication Strategy

The Central Banks' communication strategy is considered an important tool to shape and anchor inflation expectations towards achieving the core mandate of price stability including financial stability. Also, it has been observed that inflation targeting improves the credibility of Central Banks by becoming more transparent and accountable through better communication of policies.

- Is the Central Bank's communication strategy effective in capturing or anchoring public inflation expectations?
- Don't you think the language the monetary policy committee uses to engage the general public is too technical for their understanding?

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- sIs what ways can the communication strategy of the Central Bank be improved?

SECTION F

Monetary Policy Rate Signalling Role and Lending Rates Charged By the DMBs.

- Although the policy rates have signalled a downward trend in lending rates, this has not significantly reflected in the lending rates charged by deposit money banks despite the fall in inflation rate.

- In your opinion, what are the factors causing weak monetary policy transmission in Ghana?

- What measures, in your view, can be put in place to address the problem of weak monetary policy transmission the country is experiencing?

- Banks have tried to justify the large interest rate spreads in terms of their "high cost of funds" and "lending risks" (high operational costs including administrative costs, lack of reliable credit reference on potential customers, rising and high cash reserve requirement imposed by the monetary authority).

Will you subscribe to any regulatory intervention to check the high interest rates spread in Ghana (e.g. capping on banks' interest rate spread)?

If no, what pragmatic measures will you suggest to address an obvious market failure in the credit system?

SECTION G

Challenges of IT Monetary Policy framework in Ghana

- What have been the key challenges in pursuing inflation targeting framework in Ghana and what is the way forward?

- Does the continuous missing of inflation targets under the IT regime iany way affect (erode) its credibility?

- Will you recommend any alternative policy to IT framework pursued in Ghana?

Thank You