Limited Liquidity in Ghana

By Miesha Williams[1]

Abstract

This study examines the relationship between interest rates and money in circulation in Ghana. Due to the relatively large proportion of money holdings in the Ghanaian economy the study hypothesizes interest rate rules will have no impact on the real economy. The results here indicate money market liquidity constraints have spanned the gamut of monetary policy ranging from 2000 to 2016. This is important because under these circumstances monetary policy tools are virtually useless. Thus, to examine the international extension of the Taylor Rule (Taylor, 2001), as well as incorporating data from the Central Bank of Ghana and the Federal Reserve Bank of Saint Louis, this study finds evidence the monetary policy instrument has a nonnegative or insignificant impact on money in circulation. The implication is exchange rate policies or fiscal policy, as explained by Cochrane (2017), may perform better in economies like Ghana.

JEL E4 E5 E6 O55 J18

Keywords: money, Ghana, monetary policy, Taylor Rule, Africa, policy, monetary policy, public

policy

---

[*] For information regarding this paper please contact Miesha J. Williams at: 470-639-0500 (w)| miesha.williams@morehouse.edu |Morehouse College| 830 Westview Drive| Atlanta, GA 30314

I. Introduction

According to details listed on the bank of Ghana website (Note the web address is https://www.bog.gov.gh):

> *The Bank's monetary policy objective is to ensure price stability – low inflation – and subject to that, to support the Government's economic objectives including those for growth and employment…The Bank of Ghana Act 612 (2002) made the Bank independent to set interest rates. The Bank is accountable to Parliament and the wider public*
>
> *…*
>
> *The economy is subject to shocks that can cause unnecessary uncertainty and volatility. When inflation stays above target for some obvious reasons, the MPC's [Monetary Policy Committee] aim would be to steer interest rates so that inflation can be brought back to target within a reasonable period of time without creating undue instability in the economy.*

This is, no doubt, like the objective of the Central Bank of the United States which is as follows (Note one can find this quote under the subtitle "About the Fed" at federalreserve.gov):

> *[Monetary Policy] is the Federal Reserve's actions, as a central bank, to achieve three goals specified by Congress: maximum employment, stable prices, and moderate long-term interest rates in the United States.*
>
> *…*
>
> *The Federal Reserve conducts the nation's monetary policy by managing the level of short-term interest rates and influencing the availability and cost of credit in the economy.*

When one examines the proportion of currency in circulation in those respective countries, however, those striking similarities in monetary policy goals are troubling. The proportion of currency in circulation relative to M2 money specification in Ghana has ranged between 20 and 40 percent. On the other hand, the proportion of currency in circulation relative to M2 money specification has been below 12.5 percent in the United States over the same time[2]. Thus, the question in this context becomes: is an interest rate rule, like the Taylor Rule, appropriate for a country like Ghana whose proportion of currency in circulation is relatively high? This paper hypothesizes if interest rate rules were developed to influence credit, then economies where currency holdings are sufficiently large does not make sense. Using a structural vector auto regression and comparing country data this work finds evidence interest rate policies are, indeed, not helpful in economies like Ghana; moreover, exchange rate policies and fiscal policy may be more helpful.

To date, monetary policy-exchange rate policy has been considered a nexus (Savvides, 1998) in countries like Ghana and there are competing empirical findings regarding such policies in relevant literature. Specifically, Ghartey (1998) finds M1 has a long-run relationship with price, real GNP, exchange rate, and exchange risk. He reasons M1 provides stable estimates, and serves as a guide for implementing monetary policy in Ghana. He does not, however, specifically consider the most important part of M1 as in this paper, which is, currency in circulation. Kovanen, (2011) suggests the passthrough to deposit and lending interest rates is protracted and incomplete. Finally, Saxegaard, (2006) provides evidence excess liquidity weakens the monetary policy transmission mechanism and thus the ability of monetary authorities to influence demand

---

[2] Note these values are calculated by the author from data used in this paper.

conditions in the economy in Sub- Saharan Africa and Central African Economic and Monetary Community.

To address the question stated in the former for Ghana, however, this paper is organized as follows. Relevant theory is addressed along with an empirical model in the next section. A summary of the results is provided for the impulse response functions and the ensuing VAR in section III. Section IV concludes.

II.   Theory and the Empirical Model

Taylor (2001) extends the famously know Taylor Rule to include exchange rate as an international component to the rule. In general form, the model is expressed as follows:

$$Interest\ Rate = f(inflation, economic\ activity, exchnage\ rate) \tag{1}$$

The problem with this model is it inherently assumes that movement in the interest rate or monetary policy instrument can be determined from inflation, economic activity and exchange rates, rather than allowing for interest rates to impact the right-hand variables to determine how inflation, economic activity and interest rates are affected. The impact of interest rate policy can be better determined in a vector auto regression (VAR) where each shock is determined to have an impact in the response of the remaining variables. The model in equation 1 also omits the role of money, and so it is added to the VAR to help to better determine the transmission channels in the countries in this study.

Now, under the Taylor Rule it is the expectation that when interest rates increase there will be a decrease in economic activity, a decrease in money in circulation, and a strengthening of domestic currency relative to foreign currency. In the event this does not happen, the Taylor

Rule must not hold. To test this hypothesis a VAR (6) with an exactly identified, Choleski or lower triangular decomposition is presented below.

$$
\begin{pmatrix} e_Y \\ e_M \\ e_P \\ e_X \\ e_R \end{pmatrix} = \begin{pmatrix} a_{11} & 0 & 0 & 0 & 0 \\ a_{21} & a_{22} & 0 & 0 & 0 \\ a_{31} & a_{32} & a_{33} & 0 & 0 \\ a_{41} & a_{42} & a_{43} & a_{44} & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & a_{55} \end{pmatrix} \begin{pmatrix} \varepsilon_Y \\ \varepsilon_M \\ \varepsilon_P \\ \varepsilon_X \\ \varepsilon_R \end{pmatrix} \tag{2}
$$

Like Sims (1980) and as is customary with other VAR models (i.e. Ramey 2011; Christiano, Eichanbaum and Evans 1999) the "causal" ordering is such that the impact of an exogenous shock works first through GDP (Y), then through monetary channels (M), and finally through prices (P), exchange rates (X) and interest rates (R). Although the responses are "just identified" the results are compared to countries like Ghana to verify or nullify application of the Taylor Rule. Because the results appear to be somewhat consistent, one might concede the transmission channel is properly identified.

III.   Results

The results in Figure 1 and 2 use monthly data from the Central Bank of Ghana and the Federal Reserve Bank Database of St. Louis (FRED) for the United States. Observations range from February 2002 to March 2016. Responses to a one standard deviation shock to interest rates is displayed for the United States and Ghana, in Figures 1 and 2, respectively. The inside bands reveal the significance of the response at the 68% level of confidence and the outside bands coincide with the 90% level of confidence. The bottom panels of Figures 1 and 2 illustrate, with 90% certainty, a one standard deviation shock to interest rates has a 12% and 2.5% impact on interest rates in is the US and Ghana, respectively. These positive responses are sustained and level off close to 20% and 4% by 24 months after the shock. A shock to interest rates reduces

cash flow in the US, indicating the opportunity cost of money is an increased return on assets (see the second graph in Figure 1). Specifically, at the 68% level of confidence money holdings decline by about 1% between 1 and 12 months after the shock and only between months 2 and 3 at the 90% level of confidence. In the second graph of Figure 2 however, the opportunity cost of money holdings is not the return on assets. This is likely due to the fact there are large amounts of cash in circulation in Ghana. To be clear, money in circulation increases by 1% between 1 and 3 months after the shock at the 90% level of confidence, but 1 to 2 months after the shock at the 68% level of confidence.

The remaining results in Figures 1 and 2 are as follows. The response of economic activity (in the first graph of Figure 1) in the US is positive and significant at the 68% level of confidence between months 1 and 4 after the shock, but significant at the 90% level of confidence between 1 and 2 months after the shock. On the other hand, there is a significant increase in economic activity (in the first graph of Figure 2), at the 90% level of confidence, at month 6 after the shock in Ghana. The response of inflation after the shock is insignificant at the 68% and 90% level of confidence in the US, but the response inflation is positive and largely significant at the 90% level of confidence after the shock in Ghana (See the third panel in both figures.). Finally, exchange rates respond positively to the shock between 1 and 3 months at the 68% level of confidence and between 1 and 2 months after the shock at the 90% level of confidence in the US, but exchange rates are positive significant at the 68% level of confidence 4 months after the shock (See the fourth graph in both figures).

To provide additional support, Figure 3, 4 and 5 display responses of countries due east and west of Ghana (i.e. the Ivory Coast and Togo, respectively) as well as Benin. As part of the West African Monetary Union (WAMU), relevant data was gathered from the WAMU website

but observations only range from February 2005 to March 2016 due to a more restricted availability of data. In each case an interest rate shock raises interest rates (i.e. See the last graph in Figures 3, 4 and 5) to about 4.5, 10 and 8 percent, then they eventually decline to 2, 4 and 2 percent in each Figure. In all three figures economic activity is effectively non-responsive except for the temporary increases at the 68 and 90 percent levels of confidence early in the responses (See the first graph in each Figure). In Figures 3 and 4, money in circulation (This is the second graph in each figure) is also effectively non-responsive to an interest rate shock at the 90 percent level of confidence, but in Figure 5 there is an increase in cash flow at the 90% level of confidence between 3 and 6 months after the interest rate shock. Also note, inflation and interest rates have an effectively insignificant response at the 90% level of confidence in all three figures.

The responses to an exchange rate shock are provided in Figure 6-9. The main point of displaying these shocks is to note the response of economic activity in Ivory Coast and Benin. That is, at the 90% level of confidence, an exchange rate shock leads to a 1.5% decline in economic activity between 1 and 2 months after the shock in Ivory Coast and a 2-2.5% decline in economic activity starting at 2 months after the shock in Benin. All other responses, excluding the obvious positive and significant responses of exchange rates in figures 6 -9, are effectively insignificant except in Ghana. Interest rates in Ghana have a positive and significant response to an exchange rate shock at the 90% level of confidence.

All in all, the results above reveal interest rate policy stemming from the international version of the Taylor Rule are not helpful in Ghana or some other West African nations. In fact, the response of money to interest rate shocks in Ghana, Ivory Coast, Benin and Togo indicate the opportunity cost of money is not the return on assets in those countries, and interest rates policies are therefore inappropriate. Of interest to Ivory Coast and Benin, however, may be exchange rate

policies, where revaluation of currency may aid in the slowdown of an overheated economy. It is worthwhile to mention Goldfajn and Gupta (2003) provide evidence tight monetary policy facilitates the reversal of currency undervaluation through nominal appreciation. Further, according to Cochrane (2017), "When monetary policy is passive [or in the case of Ghana relatively weak] inflation is stable [as is proven by response of inflation to an interest rate shock in Ghana] an "active" fiscal policy can substitute for "active" monetary policy." Thus, monetary authorities would do best to reduce the amount of money holdings by individuals or focus on stabilizing primarily through fiscal or exchange rate management.

IV.   Conclusion

This paper provides evidence that interest rate rules like the Taylor Rule may not be helpful in countries like Ghana. This is similar to findings of Boamah (2012). Abradu-Otoo *et. al*, (2003) point out monetary policy instruments affect inflation and output in the Ghanaian economy in the long run and exchange rate channels remain the main medium through which monetary policy acts. In fact, in this study it appears that in certain countries in West Africa exchange rate policies might be more helpful, although Balogun (2007) contends exchange rate devaluations manifest mainly in domestic inflation and have no effect at all on growth variable. In any case fiscal policy, as Cochrane (2017) points out, should always be more useful in countries like Ghana. Although due to the history of the countries above fiscal restraint may be an issue (Debrun, Masson and Patillo, 2005). This research also contributes to claims policies that work in western economies are not necessarily appropriate in countries with different culture, principles, tenants, norms and institutions.

Citation

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*, *2*.

Balogun, E. D. (2007). Monetary policy and economic performance of West African monetary zone
countries. *West African Journal of Monetary and Economic Integration*, *7*(1), 33-59.

Boamah, M. I. (2012). Taylor rule and monetary policy in Ghana. *International Journal of Economics
and Finance*, *4*(7), 15.

Christiano, L. J., Eichenbaum, M., & Evans, C. L. (1999). Monetary policy shocks: What
have we learned and to what end?. *Handbook of macroeconomics*, *1*, 65-148.

Cochrane, J. H. (2017). The new-Keynesian liquidity trap" *Journal of Monetary Economics*,
92(1), 47-63.

Debrun, X., Masson, P., & Pattillo, C. (2005). Monetary union in West Africa: who might
gain, who might lose, and why?. *Canadian Journal of Economics/Revue canadienne
d'économique*, *38*(2), 454-481.

Ghartey, E. E. (1998). Monetary dynamics in Ghana: evidence from cointegration, error
correction modelling, and exogeneity. *Journal of Development Economics*, *57*(2),
473-486.

Goldfajn, I., & Gupta, P. (2003). Does monetary policy stabilize the exchange rate following
a currency crisis?. *IMF Staff Papers*, *50*(1), 90-114.

Kovanen, A. (2011). Monetary Policy Transmission in Ghana: Does the Interest Rate
Channel Work?. *IMF Journal Issue, 2011, 275*.

Ramey, V. (2011). "Identifying government spending shocks: It's all in the timing." *The Quarterly Journal of Economics, 126(1)*, 1-50. doi: 10.1093/qje/qjq008

Savvides, A. (1998). Inflation and monetary policy in selected West and Central African countries. *World Development, 26(5),* 809-827.

Saxegaard, M. (2006). Excess Liquidity and Effectiveness of Monetary Policy: Evidence from Sub-Saharan Africa. *IMF Journal Issue, 2006*, 115.

Sims, C. A. (1980). Macroeconomics and reality. *Econometrica: Journal of the Econometric Society*, 1-48.

Stock, J. H., & Watson, M. W. (2001). "Vector autoregressions". *The Journal of Economic Perspectives, 15(4)*, 101-115. Retrieved from http://www.jstor.org/stable/2696519

Taylor, J. B. (2001). The role of the exchange rate in monetary-policy rules. *The American Economic Review, 91(2),* 263-267.

Figure 1

Interest Rate Shock in the US
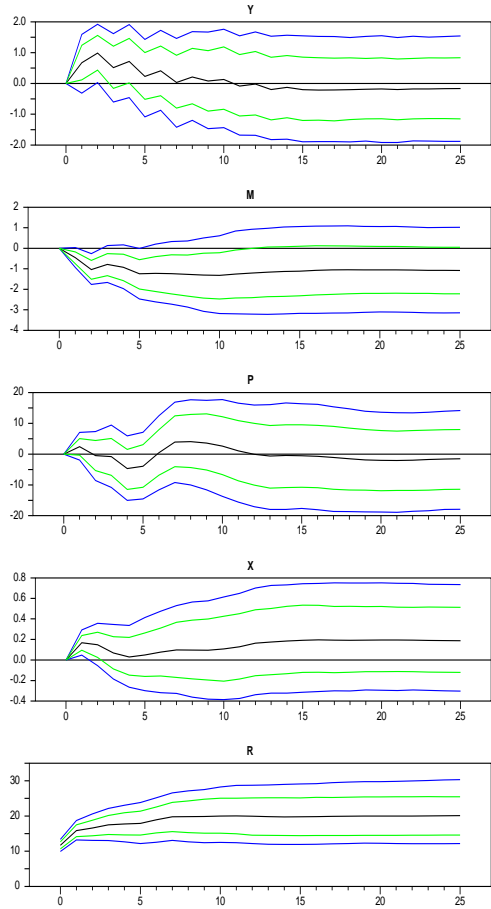
Responses to R

Figure 2

Interest Rate Shock in Ghana
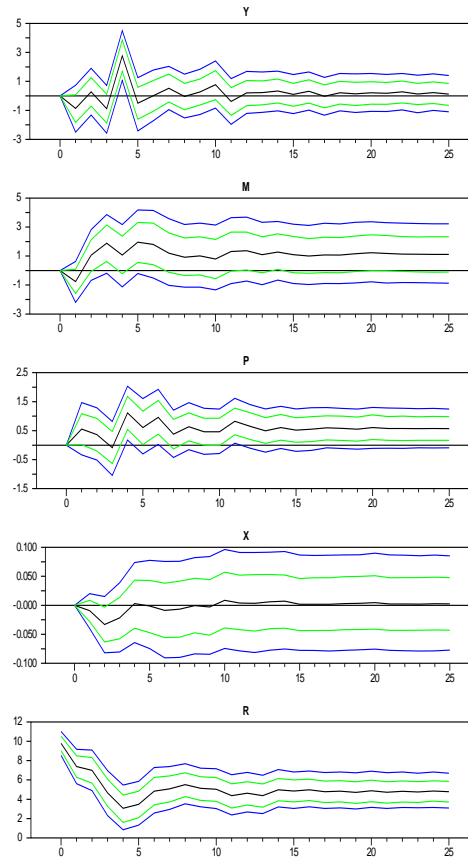

Responses to R

11
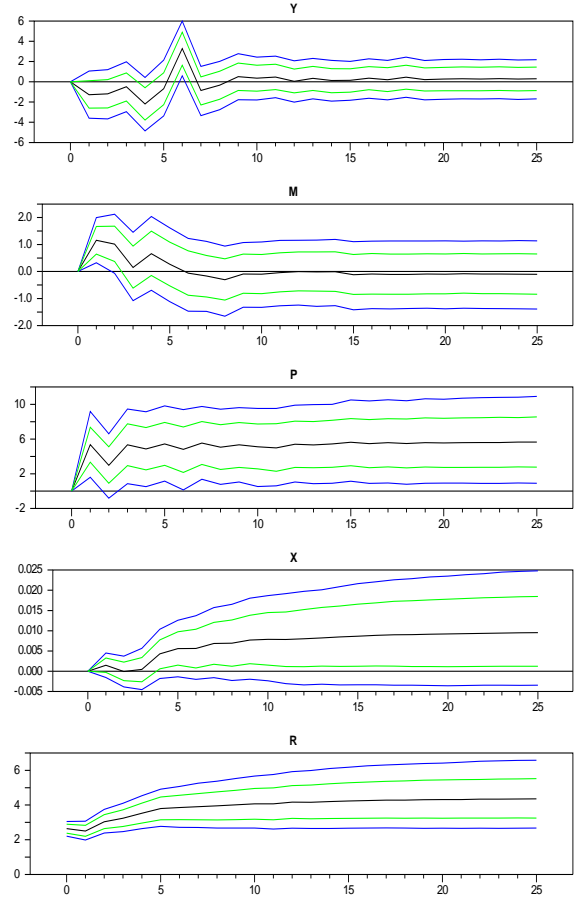
Figure 3

Interest Rate Shock in the Ivory Coast
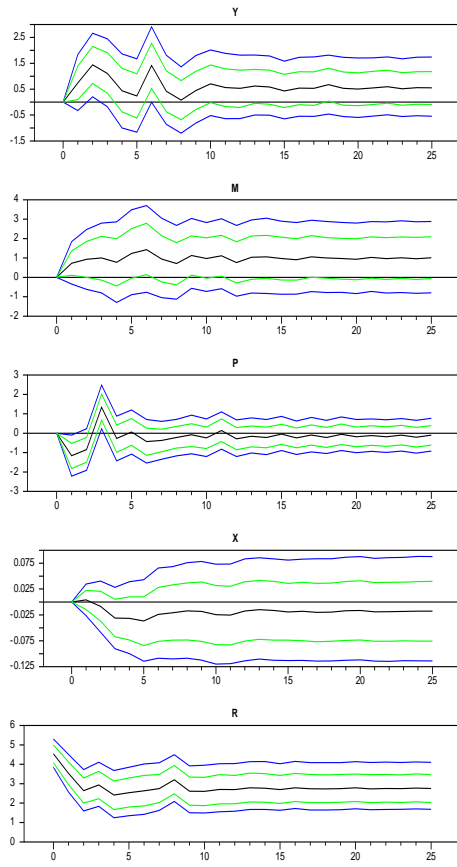
Responses to R
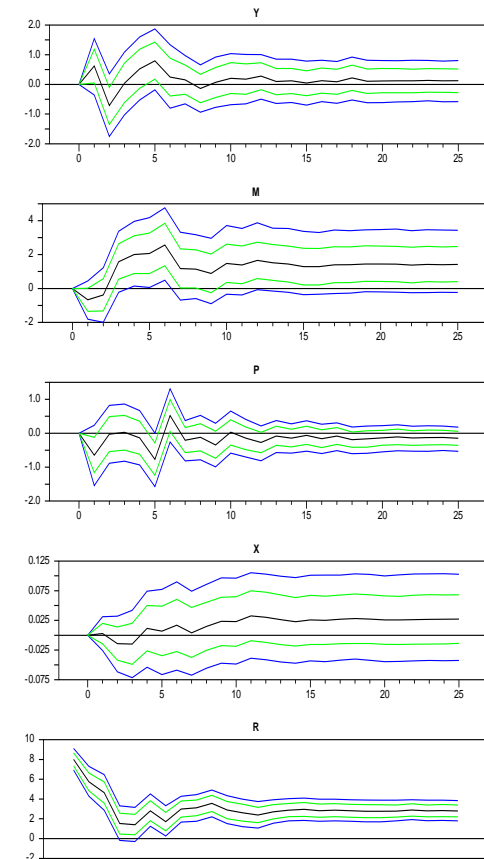
Figure 4

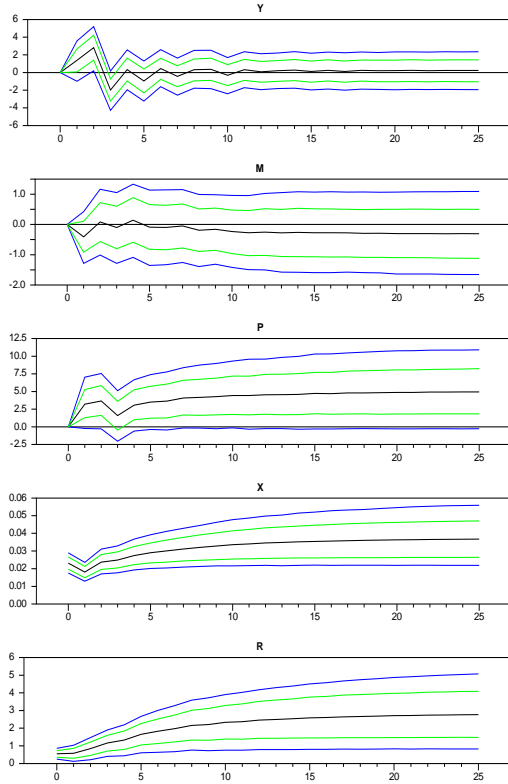Interest Rate Shock in Benin

Responses to R

Figure 5

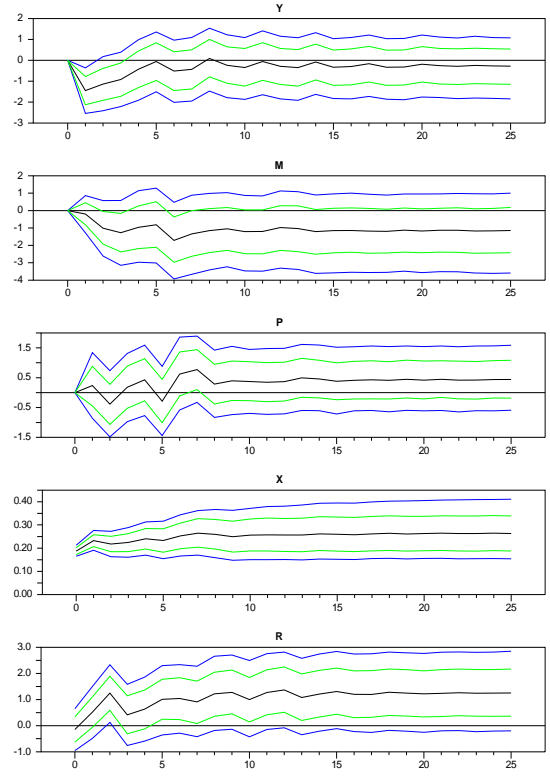Interest Rate Shock in Togo

Responses to R

12

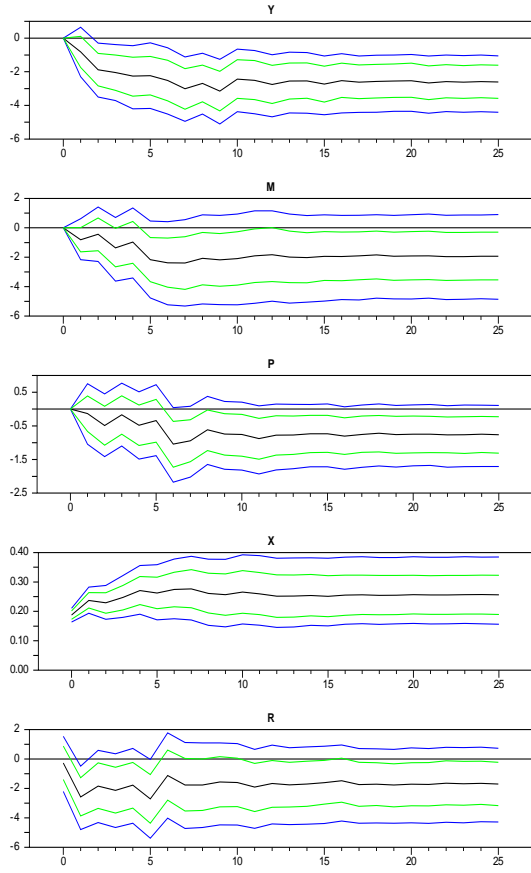**Figure 6**

Exchange Rate Shock in Ghana

Responses to X

Figure 7

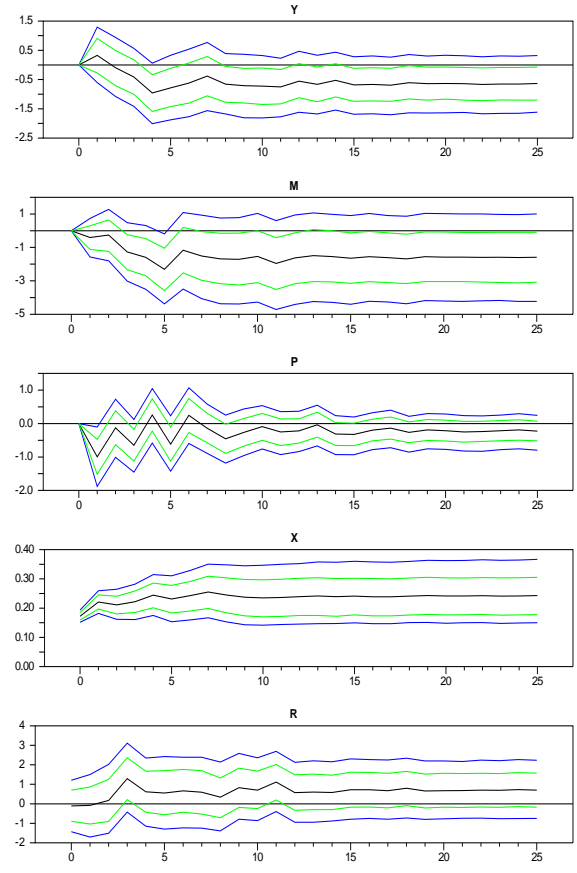Exchange Rate Shock in the Ivory Coast

Responses to X

13

Figure 8

Exchange Rate Shock in Benin

Y

M

P

X

R

Responses to X

Figure 9

Exchange Rate Shock in Togo

Y

M

P

X

R

Responses to X

14