BANK OF SIERRA LEONE POLICY BRIEF

The Transmission Channel of Monetary Policy to the Real Economy Revisited: Evidence from Sierra Leone

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Abstract

The objective of the study is to investigate the transmission channel of monetary policy to domestic price level in Sierra Leone. The non-recursive structural vector autoregressive technique was employed using quarterly data from 2002 to 2018. This technique was considered appropriate because it has two-way or bidirectional causal effects among endogenous variables and ordering of endogenous variables are considered flexible. The impulse response results show that the exchange rate channel is a valid channel of transmitting monetary policy effect to domestic price level in Sierra Leone, while bank lending and interest rate channles were found to be weak. Thus, a strong national effeort that strongly promotes large scale production of products that take a large chunk of food imports is imperative, which calls for large investment in rice production.

The Bank of Sierra Leone (BSL) Policy Brief is a publication of the Research and Statistics Department of the Bank of Sierra Leone. The BSL policy briefs are short forms of published papers or completed papers of staff of the Bank in non-technical or constrained technical forms, with policy implications for macroeconomic management in Sierra Leone. Papers with policy implications for inflation, financial stability, growth and external sector resilience are prioritised.

The content of this policy brief does not necessarily represent the views of the Bank of Sierra Leone, but represents the views of the author. I am grateful to Dr. Robert Dauda Korsu, Director, Research and Statistics Department, Bank of Sierra Leone for his painstaking comments that led to the final version of this policy brief.

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1. Introduction

Understanding the channels of monetaery policy transmission in an economy remians important to central banks around the world. Essentially, it is about knowing how changes in monetary policy affect the real sector of the economy, including the price level. In this regard, knowledge about the process it takes is also an issue of relevance. Traditionally, the interest rate channel, exchnage rate channel and bank lending channel are the most widely identified channels in develping countries without an active stock exchnage (Mishkin, 1995). We investigated the channel through which monetary policy is transmitted to the real sector of Sierra Leone. Several studies have been undertaken on the conduct of monetary policy in developed and developing countries over the last four decades with different approaches. Some focused on the effectiveness of monetary policy in a well-developed and functioning financial system, while others focused on economies with less developed financial system. For instance, Lavally and Nyambe (2019) used annual

data from 1980 to 2012 to examine the transmission mechanisms of monetary policy in Sierra Leone within the framework of the vector autoregressive model while for Ogunkula and Tarawalie (2008) used the same framework but with quarterly data from 1990 to 2006 in Sierra Leone. Both studies found an ineffective transmission channel of monetary policy in Sierra Leone. However, the latter study revealed further that the bank landing channel is a moderate channel of monetary policy transmission. This study departs from previous studies on Sierra Leone on the ground that it captures the period in which the Monetary Policy Committee (MPC) was formed by the Bank of Sierra Leone. In addition, it uses the non-recursive Structural Vector Autoregression (SVAR) model. The non-recursive SVAR is flexible and has reciprocal effects among endogenous variables (bidirectional causality) and the errors are correlated with one another (Rummel, 2015). Similarly, knowledge of the right channel of monetary policy transmission helps monetary authorities in the use of instruments for targeting broad money as a nominal anchor of the Bank of Sierra Leone’s conduct of monetary policy.

The rest of the policy brief is organised as follows. Section two provides brief literature review. Section three discusses the methdology, while Section four presents analysis of the empirical resullts and Section five is conclusion and policy implications.

2. Brief literature review

The appropriate transmission channel of monetary policy has been an empirical debate over three decades. The contention has been on identifying the right channels through which monetary policy trickles down to the real sector of the economy. Several studies over the years have investigated the effectiveness of monetary policy through the investigation of various channels. According to Romer (1996), an effective monetary policy is expected to positively trigger activities in the financial sector. In an attempt to identify the right channle among a menu of channels in the literature, policymakers have found it difficult to come out with an appropriate channel that suits developing countries (Bahmani-Oskooee and Gelan, 2009). In addition, there have been different approaches and methodologies in the literature.

In the case of Sierra Leone, Tucker (2005) investigated the channels of monetary policy using quarterly data from 1981 to 2005. By applying the VAR framework, three separate models were estimated by Tucker (2005). The first model was described as the basic model that comprises four key variables namely Treasury bills rate, broad money, consumer price index and real GDP. This basic model was extended by incorporating additional variables that represented each of the channels using credit to private sector as proxy for bank lending channel and nominal exchange rate to represent the exchange rate channel. Finally, the basic model was used to describe the interest rate channel. Open market operation was used in the study as instrument of monetary policy, while Treasury bills rate was used as instrument of the BSL's policy. Empirical findings arrived at inconclusive outcomes with no evidence of appropriate channel of policy transmission. This result supports Lavally and Nyambe (2019). They applied annual data from 1980 to 2012 on interest rate, exchange rate, private domestic credit and GDP per capita. The Johansen cointegration technique was used to establish whether cointegration existed among the variables especially in the long-run. Empirical findings support ineffectiveness of any of the channels in transmitting policy actions to the economy.

Ogunkola & Tarawalie (2008) examined policy transmission in Sierra Leone using quarterly data from 1980 to 2006. The CPI inflation, effective exchange rate in real terms, private sector credit, short-term interest rate, Treasury bills rate, United States funds rate and global oil price were used in the estimation. The Johansen cointegration technique was applied to test for cointegration. Empirical results provide evidence that the bank lending channel was appropriate in transmitting policy actions to the economy. Similarly, Toe' et al. (2009) applied the VAR technique on monthly data spanning from February 2002 to December 2007 for real output, CPI inflation, 91-day Treasury bills rate and exchange rate to investigate the channels of transmission of monetary policy in Sierra Leone. Treasury bills rate and market interest rates (lending rate and deposit rate) were used as proxies for the interest rate channel. The result also reveals the existence of the exchnage rate channel of monetary policy transmission to inflation but not output.

3. Methodology

The non-recursive Structural Vector Autoregressive technique was applied to investigate the transmission channels of monetary policy to the real economy in Sierra Leone, using quarterly data from 2002 to 2018. This technique has been considered adequate and appropriate because unlike the recursive case, where the ordering of the endogenous variables should to start from the non-policy variable and end with the policy variable, the ordering is not necessary in the non-recursive case. We used reserve money as monetary policy instrument of the Bank of Sierra Leone. Credit to the private sector, Treasury bills rate and nominal exchange rate were used in the model. This gives opportunity to test for the existence of the bank lending, interest rate and exchange rate channels of monetary policy transmission. Nominal exchange rate was used to capture external sector linkage. CPI was used as the ultimate objective variable. The non-recursive identification scheme was applied to impose short-run restrictions on the model in line with economic theory. A baseline model was first estimated to establish the monetary policy reaction function of the Bank of Sierra Leone using reserve money as policy instrument. The choice of reserve money as instrument of monetary policy is well documented in the literature especially for countries that are using flexible exchange rate regime and the monetary targeting framework, including Sierra Leone. The baseline model was then augmented with the inclusion of the 91-day Treasury bills rate to capture the interest rate channel, credit to private sector to capture the bank lending channel and nominal exchange rate to capture exchange rate channel. The nominal exchange rate is defined here as Leone per U. S dollar was used.

4. Analysis of Empirical Results

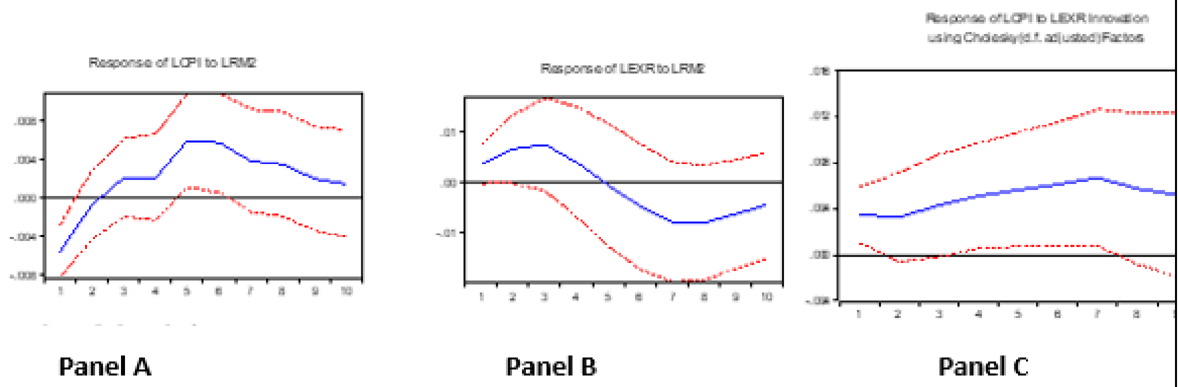
In Figure 1, we present the main empirical results of the impulse response functions from the model. In Panel C of Block I of the figure, which tests the exchnage rate channel of monetary policy, a shock to reserve money has a significant positve effect on the exchnage rate up to two quarters. Though the effect is positve, during the third to fifth quarters, the impact is insignificant. However, shock to the exchnage rate raises the price level significantly in the first two quarters. But between the second and fifth quarter, while the impact reamins positive, it is insignificant. In the forth to seventh quarter, the exchnage rate effect follows an upward trend with significant effects. Thus, the exchnage rate channel of monetary policy transmission to domestic prices in Sierra Leone is effective. This result corroborates with Tucker (2005), Toe' et al. (2009) and Bangura et al. (2012), but contradicts Ogunkola & Tarawalie (2008) and Lavally & Nyambe (2019).

The bank lending channel of monetary policy transmission was tested following the inclusion of credit to the private sector into the baseline model. The result is shown in Block II of Figure 1. The result shows that shocks to reserve money does not have significant impact on credit to the private sector, (Panel B of Block II) but has a positive and significant impact on domestic price level in the first three quarters. However, it does not have a significant impact on credit to the private sector. Thus, the bank lending channel of monetary policy transmission channel is not effective. This may be attributable to the risk averse behaviour of banks, leading to extension of credit to risk free options such as government securities away from the private sector.

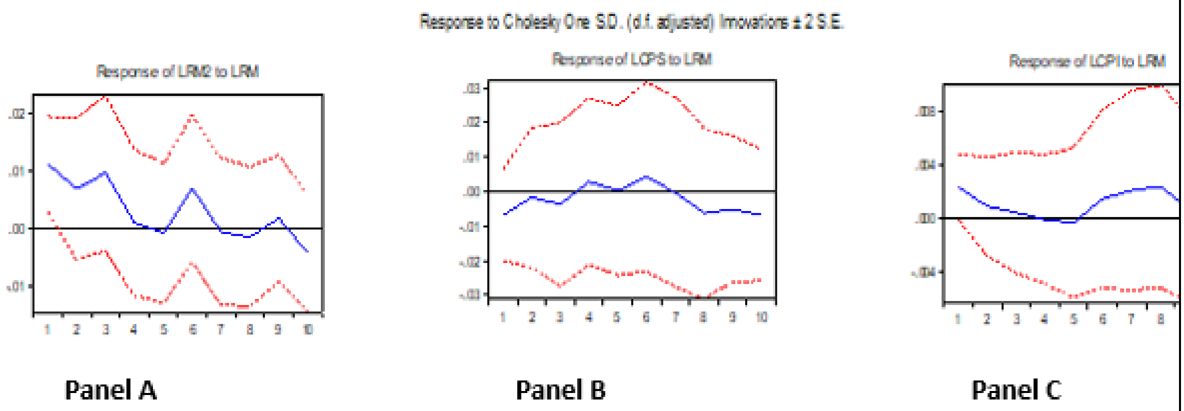
In Block III of Figure 1, the result of the interest rate channel is presented. Panels B and C in Block III show that a shock to reserve money does not have a significant impact on interest rate, (Panel B) in spite of the evidence of lower interest rate, as the upper bound of the 95% confidence interval is above zero and the lower bound is below zero. However, the shock raises the price level in the first two quarters. Thus, the interest rate channel of monetary policy transmission in Sierra Leone is ineffective.

Figure 1: Impulse Response Results from the Augmented SVAR Model of Monetary Policy Transmission

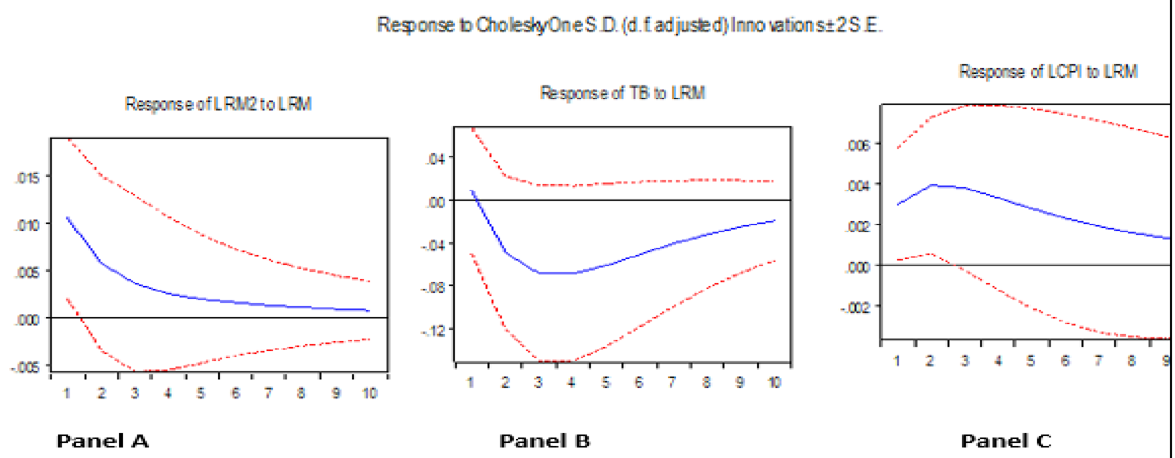
Bloack I : Exchange Rate in the Baseline Model



Block II: Private Sector Credit in the Baseline Model



Block III: Treasury Bill Rate in the Baseline Model



Source: Author's Estimation

While we have investigated the effectiveness of three channels of monetary policy transmission mechanism with data from 2002 to 2018, it is useful for further research to consider explicit use of the Monetary Policy Rate (MPR) for the period Sierra Leone introduced the MPR, in which case, monthly data may also be useful, as this study leveraged on longer period of study but was limited to use of the Treasury bill rate.

5. Conclusion and Policy Implications

Understanding the channels of monetaery policy transmission in an economy remians important to central banks around the world. We investigated the channel through which monetary policy is transmitted to domestic price level in Sierra Leone. A baseline non-recursive SVAR model was first estimated using reserve money, credit to the private sector and consumer price index, with data from 2002 to 2018. This was to establish the monetary policy reaction function of the Bank of Sierra Leone using reserve money as policy instrument. The baseline model was then augmented with the inclusion of the 91-day treasury bills rate, credit to private sector and nominal exchange rate.

Results of the impulse response identified the exchange rate channel as the channel through which monetary policy effect is transmitted to domestic price level in Sierra Leone. This reinforces the importance of the external sector in the country. Given that the country’s main staple food is rice and a large portion of import expenditure goes to rice importation, it is useful to have a strong national policy effort to revamp the agricultural sector in order to enable the country produce large volume of rice to match local demand and high quality. This can lessen the burden on the foreign exchange and give the Central Bank the leeway for stabilizing prices. In addition, continued fiscal efforts to manage the inflation-unemployment trade-off is imperative. This requires strong domestic tax collection compliance and further expenditure rationalization to make domestic banks place more weights on lending to the private sector.

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