Novelty Journals

ISSN 2394-7322

International Journal of Novel Research in Marketing Management and Economics
Vol. 2, Issue 1, pp: (64-70), Month: January - April 2015, Available at: www.noveltyjournals.com

The Impact of Monetary Policy on Consumer Price Index (CPI): (1985-2010)

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Abstract: **The research on the impact of monetary policy on Consumer price index (CPI) was conducted by taking Rwanda National Bank (BNR) as a case study, period 1985- 2010. The researcher main purpose was to evaluate the use of monetary policy on economy. The specific objectives were to find out the impact of monetary policy on CPI and to describe strategies of monetary policy in stabilizing Rwandan economy.To achieve the desired objectives, the researcher analyzed how independent variables of the Monetary Policy (Money Supplier, Exchange Rate and Lending Interest Rate) work and how they affect the dependent variable (CPI). Augmented Dickey-Fuller (ADF) and Phillips- Perron (PP) tests were used to for stationarity test. Engle- Granger two steps procedure and the Johansen Maximum Likelihood Methodology were used to see whether variables are cointegrated or not. The data analysis was done using Eviews 7 Software. Those tests revealed that there is no cointegration among variables. And this has leaded to the use of impulse response in order to estimate the impacts of monetary policy on Consumer price index.The research found that the National Bank of Rwanda uses different tools of monetary policy in order to stabilize economy. It uses them in attempting to achieve the objectives of the monetary policy. With those tools, money supply, credit, interest rates and other monetary variables can be manipulated by the central bank of Rwanda in order to stabilize economy.**

Keywords: **Consumer Price Index (CPI), Exchange rate, Lending interest rate, Money, Monetary Policy, Money supply.**

I. INTRODUCTION

Monetary policy is defined as the regulation of the money supply and interest rates by a central bank. Monetary policy also refers to how the central bank uses interest rates and the money supply to guide economic growth by controlling inflation and stabilizing currency.

The Consumer Price Index (CPI) is a measure of changes in prices of goods and services within the household basket.

Monetary policy objectives (Khan, 2010) have traditionally included price stability, promoting growth, achieving full employment, smoothing the business cycle, preventing financial crises, and stabilizing long-term interest rates and the real exchange rate. Monetary policy targets are classified as either operating targets or intermediate targets. Intermediate targets are variables that affect the ultimate objectives of monetary policy, but are not controlled directly by the central bank. They include various monetary aggregates and long-term interest rates. In contrast, operating targets are tactical goals that the central bank can influence in the short run.

Monetary instruments that affect operating targets are generally classified as either direct or indirect.

Direct instruments function according to regulations (granted to the central bank) that directly affect either the interest rate or the volume of credit. Indirect instruments are also termed "market-based instruments," since their use affects the market determined price of bank reserves as the central bank engages in transactions with both financial and nonfinancial institutions.

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Monetary policy uses a variety of tools to control and influence outcomes such as economic growth, inflation, exchange rates with other urrencies.

In the sub-Sahara African context, reforms increased significantly since the 1990s (Calamitsis, 1999). The broad strategy has been the emphasis placed on the policy programs supported by the International Monetary Fund and the World Bank, including among others fiscal reforms (Shandra, 1996), liberation of exchange restriction and the adoption of indirect instrument of monetary policy, market-based interest policies (Africa Progress Panel, 2014).

Rwanda is no exception to this situation. Monetary policy in Rwanda has had several reforms (Musoni , 2008) over time, from the use of direct instruments to indirect instruments to achieve macroeconomic targets within a liberalized system. Currently, the National Bank of Rwanda (BNR, 2013) conducts monetary policy based on a monetary targeting framework with the monetary base as operating target and interest rate as the policy instrument.

The present research targets to analyze different tools of monetary policy used by the National Bank of Rwanda in order to stabilize economy. With those tools, money supply, interest rates and other monetary variables can be manipulated by the central bank of Rwanda in order to stabilize economy. The outcome of this study will help improve monetary policy implementation and thus strengthen macroeconomic stability in Rwanda.

II. METHODS

The research covers the period of 1985-2010. The data are taken from National Bank of Rwanda (NBR) Library. The data analysis and processing followed the model built on dependent variable which is CPI and independent variables which are Money Supply (M2), Lending Interest Rate (LIR) and Exchange Rate (EXCH).

The model used is Phillips' formula usually used by several researchers in econometric domain such as Uruakpa, (Uruakpa, 2011), Heejoon Han, Ali M. Kutan, and Doojin Ryu (Han, Kutan & Ryu, 2015) and others.

$Yi = f(Y1, Y2, Y3)$ or $Y_i = \beta_0 + \beta_1 Y_1 + \beta_2 Y_2 + \beta_3 Y_3 + \varepsilon_t$, which, for this research, became

$$CPI = f(M2, LIR, EXCH) or\ CPI = \beta o + \beta_1 M2 + \beta_2 LIR + \beta_3 EXCH + \varepsilon t\ ;$$

Where:

CPI: Consumer Price Index

M2: Money Supply

LIR: Lending interest rate

EXCH: Exchange rate

εt: Error term

The research used three tests: Augmented Dickey- Fuller (ADF) (Sj¨o, 2008) and Phillips- Perron (PP) for stationality test (Mahadeva & Robinson, 2004),

Engle- Granger two steps procedure (Zivot, 2012) and Johansen Maximum Likelihood (Johansen, 1988), Methodology for cointegration test and modeling. Eviews 7 program (Batchelor, 2000) has been used in econometric analysis for statistical computations.

III. RESULTS AND DISCUSSIONS

The evolution of CPI, Money Supply, Lending Interest Rate and Exchange Rate in Rwanda

During the period mentioned above, the research noted the evolution of CPI, Money Supply, Lending Interest Rate and Exchange Rate in Rwanda as summarized in the following figures:

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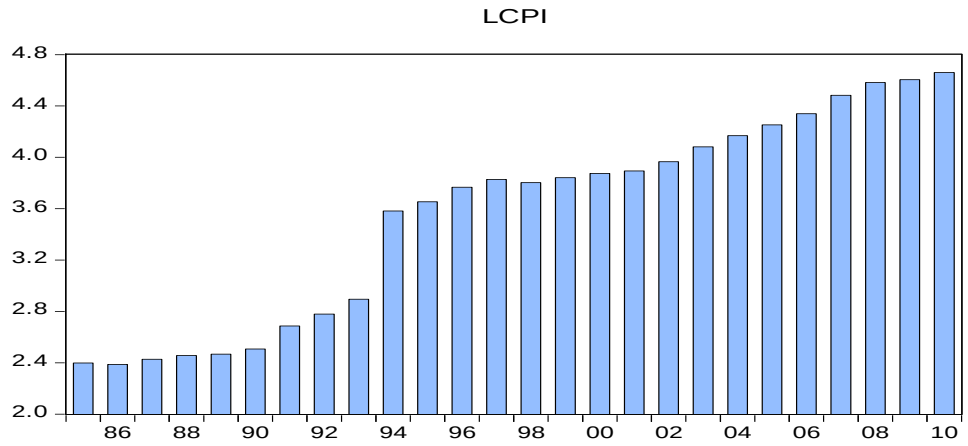
Evolution of Consumer Price Index (CPI)

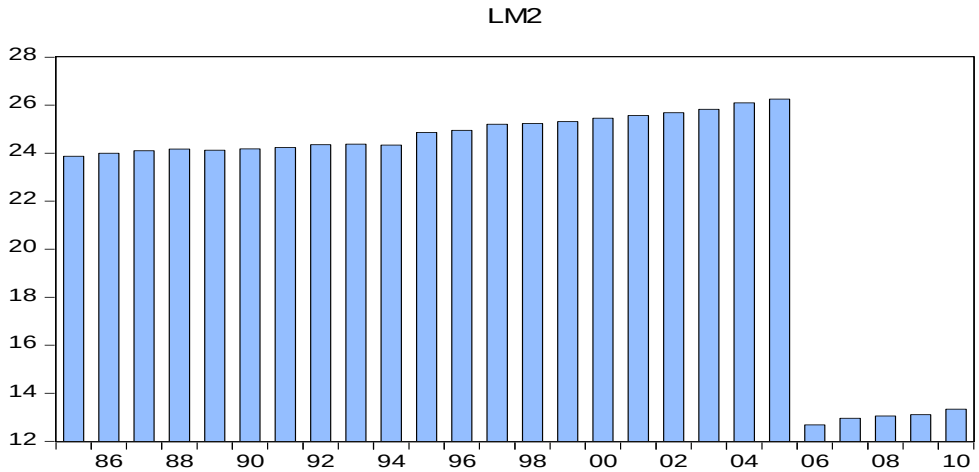


Source: Eviews7

The figure shows that from 1985 to 2010, the CPI of Rwanda was generally increasing. The continual increase in prices discourages production of the country.

Price stability is a situation where inflation is low enough that it is no longer having a material effect on people's economic decisions. A credible commitment by the monetary authorities to keeping inflation low and stable provides a climate conducive to sound economic decisions (Frederic, 2000). It also leads to lower interest rates, supporting productive investments that allow the economy to grow at a sustainable, non-inflationary pace over time and to generate higher incomes and new jobs. Price stability is seen as a measure of economic stability. In an economy where prices are considered stable, factors such as inflation and deflation have a minimal effect, and prices on goods and services change little from year to year. Generally, price stability is considered to be a good, though not necessarily totally achievable goal for an economy (African Development Bank Group, 2003).

Evolution of Money Supply (M2)



Source: Eviews7

This figure shows that from 1985 to 2005, the money supply was increasing but not significantly, and it decreased considerably in 2006, however, from that year, the money supply started increasing again.

Much money in circulation is associated with inflation and little money in circulation can be associated with problem.

Monetary policy guides the Central bank's supply of money in order to achieve the objectives of price stability (or low inflation rate), full employment, and growth in aggregate income.

The instruments of monetary policy used by the Central bank depend on the level of development of the economy, especially its financial sector (Carl, 1979).

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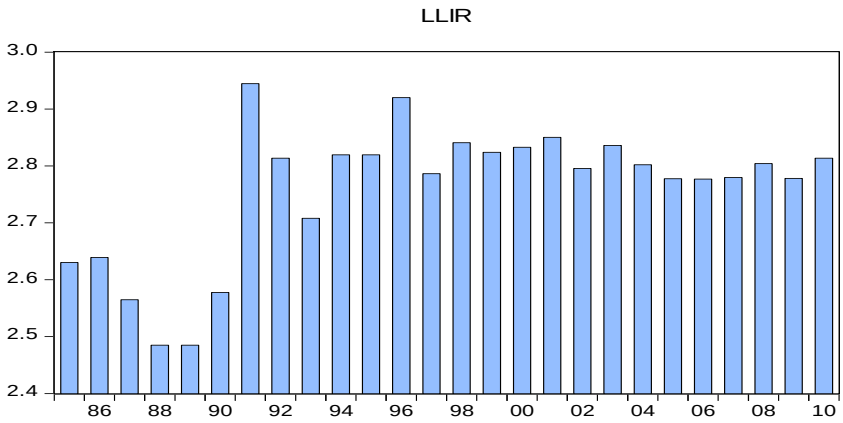
Lending Interest Rate (LIR)

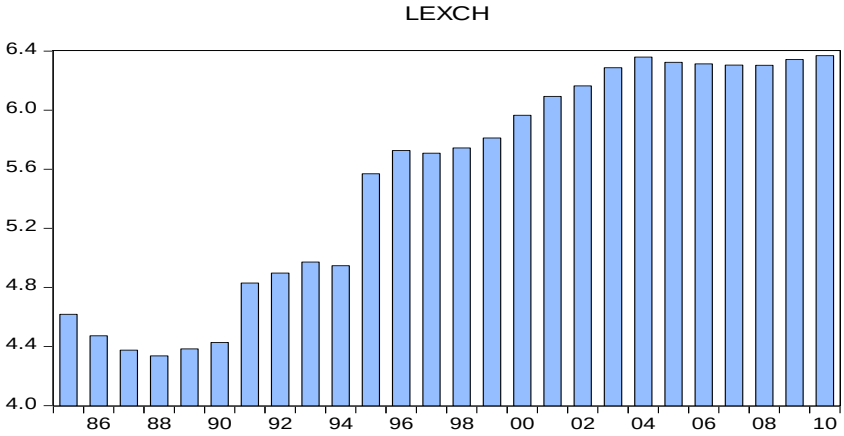


Source: Eviews7

From 1986 to 1989, the Lending Interest Rate was decreasing. From 1989 to 1991, it was increasing but it decreased gradually until 1993. From 1995, the Lending Interest Rate was also increasing until 1996 and after that year it stabilized in many years.

Normally, the high Lending Interest Rate (Mohane, Gerhard & Grant, 2002) has various economic effects ("Effect of raising interest rates", n.d., para 5) such as Increases the cost of borrowing, Increase in mortgage interest payments, Increased incentive to save rather than spend, Higher interest rates increase the value of pound, Rising interest rates affect both consumers and firms**,** Government debt interest payments increase, Reduced confidence**.** The higher lending interest rate is a sign of refusal by commercial banks to offer credits to borrowers, most of the time that results from the discount rate charged by the central bank to commercial banks (Calcagnini, Farabullini & Giombini, 2012).

Exchange Rate (EXCH)



Source: Eviews7

From 1985, the Rwandan currency was being appreciated, but from 1988, it started depreciating in general and it became almost stable from 2005 up to 2007. From 2008, the Rwandan currency was generally depreciating (Musoni, 2008).

The impact of monetary policy on CPI in Rwanda

The research found three panels of impulse response graphs indicating how increase in respective monetary policy variables affects the CPI in a period of five years. A value of zero means that the increase in monetary policy variable has no effect on CPI. A positive or negative value indicates that the increase in the monetary policy variable would cause the CPI to be above or below its natural path as the case may be. The blue lines depict the estimated effects, while the dashed red lines show the boundaries of a 95% confidence interval.

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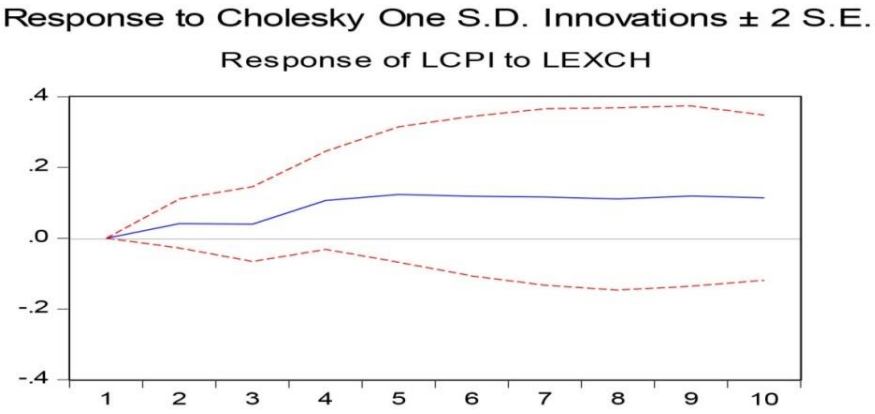
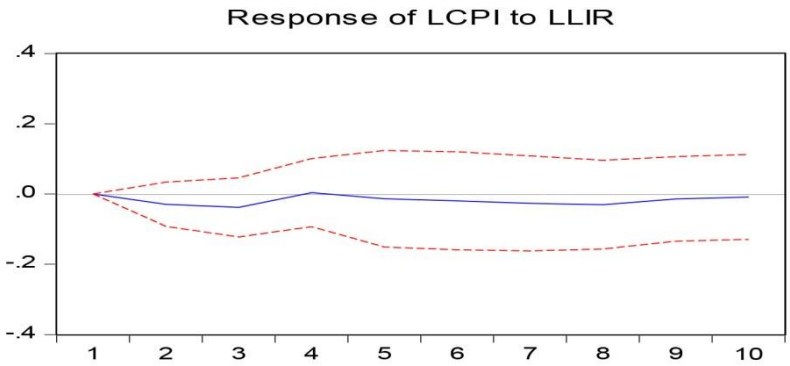
Effect of CPI to EXCH



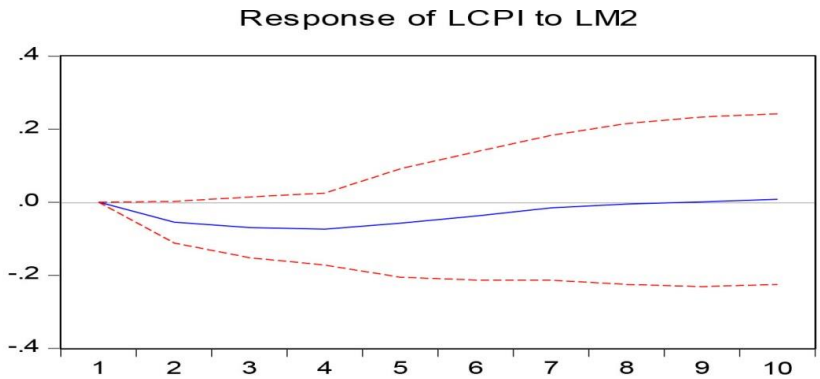
The panel 1 shows that an increase in nominal exchange rate has an effect of increasing of CPI and causes inflation in the first year; in the second year it becomes stationary while it increases again in the third year and becomes stationary in the following years.

Effect of CPI to LIR



The panel 2 shows that increase of lending interest rate has an effect of decreasing inflation in the first two years. However, in the third year, inflation increases again and reaches its level of beginning in the fourth and fifth year. In the following years, inflation is found to decrease. This is logical because increase interest rate discourages people to ask for loans and consequently reduces money into circulation.

Effect of CPI to LM2



Panel 3 shows that increase in money supply decreases inflation considerably in the first year. However, in the second year, inflation start increasing again and it reaches its original level in the seventh year but it increases again in the tenth year.

It means that, when monetary authorities realize a need of stimulating production, they increase money into circulation. That increased money is invested into productive activities which increase production.

The control of money supply is an important policy tool in conducting monetary policy. The success of monetary policy depends on the degree of predictability, measurability and controllability that the monetary authority has over Money supply (RUDATINYA, 2012).

IV. CONCLUSION AND RECOMMENDATIONS

The Rwandan currency has been depreciating during the period under consideration. This depreciation increases inflation and affect the Consumer price index (CPI). The lending interest rate has also been increasing what can be explained by fact that the central bank of Rwanda has been increasing the bank rate charged to commercial banks. And this situation leads commercial banks to charge a higher interest rate to the borrowers. This increase in inflation resulting from the increase in nominal interest rate is due to the fact that a high interest rate can discourage investment which discourages production.

When there is an increase in money supply, inflation decreases considerably. That increased money is invested into productive activities which increase production. When monetary authorities realize a need of stimulating production, they increase money into circulation.

In order to stabilize economy the central bank of Rwanda uses different strategies such as open market operation, reserve requirements, discount rate, selling or buying foreign exchange, direct credit control and moral suasion.

The research recommends to the central bank to decrease the interest rate in order to motivate investors and increase the level of production in Rwanda by motivating and orienting them to invest strategic sectors in order to find solutions to a weak supply capacity of Rwanda in international trade by promoting export of Rwanda. This can reduce also the Rwandan imports and this can be a solution to inflation in Rwanda.

The research recommends also to monetary authorities to avoid the depreciation of Rwandan by stabilizing price and money supply because the depreciation of Rwandan currency brings inflation in Rwanda.

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