

Analysis of financial innovations implemented by National Bank of Rwanda in line with its monetary policy.

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Abstract: This study aimed to analyze financial innovations formulated by the National Bank of Rwanda in its monetary policies between 2004 and 2015. The study's findings reveal that financial innovations during the period under review resulted in positive impacts. Financial inclusion widened and deepened, ratios of deposits and credit to the private sector increased, the banking sector became competitive, the number and volume of transactions increased and alternative savings through treasury bills were introduced for the betterment of the banking sector and the economy at large. Resultantly, regional banks established base as due to the fairly stable banking sector. This policy review illustrates that financial innovations affect the account of the monetary policy.

Key words: Monetary Policy; financial innovations; Rwanda

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I. Introduction

The Commission on Growth and Development stated that economies that have sustained growth are characterized by (a) openness to global economy; (b) macroeconomic stability; (c) high levels of private and public investment (d) respect for market signals but not absolute deference to markets; and (e) government provision of public goods (World Bank, 2008). Although this does not explicitly specify that monetary policies are an important requirement for stable growth and macroeconomic stability, it does indicate that financial innovation is linked to appropriate monetary and fiscal policies. Financial innovation involves new and improved products, processes, and organizational structures that can reduce costs of production, better satisfy customer demands, and yield greater profits (National Bank of Rwanda, 2016).

In economics, the total amount of monetary assets disposable in an economy at a specific time is called money supply. Because of the effects on the price level, inflation, the exchange rate, and the business cycle, private and public sector analysts have long monitored changes in the money supply (Lipsey & Smith 2010). Financial innovations come in form of introduction of new financial instruments, changes in the structure and depth of financial markets, changes in the role of financial institutions, the methods by which financial services are provided and the introduction of new products and procedures (Nyamongo et al., 2013). Therefore, there is a need to analyze monetary policy tools to understand 'how and why certain policies come to be developed in particular contexts, by who, for whom, based on what assumptions and with what effect (Blackmore and Lauder, 2005: 97).

A long-term study of monetary policy in Africa, first conducted by Nell and Forstater (2003) using data from Rwanda showed that Rwanda has a stable money demand and that the money market needs just over five quarters to eliminate half of any monetary disequilibrium. However, IMF (2015) states that "low- and lower-middle-income countries (LLMICs) face frequent and large shocks (domestic supply shocks, global food, and fuel price shocks) that raise the volatility of inflation and can pose complex trade-offs. For example, starting 2008, changes in monetary and financial sectors happened in Rwanda and this resulted in impulse response functions such as demand shocks (National Bank of Rwanda, 2016).

The macro-economy of Rwanda has been characterized by the inflation problem since 1973 (Rutayisire and Umubyeyi, 2013). Moreover, BNR implements its monetary policy under the monetary targeting regime which assumes that the money multiplier and money demand are stable (National Bank of Rwanda, 2016). These three results or observations are of interest to economists as indicated, financial innovations may lead to instability of economic variables such as money demand and the money multiplier. Besides this instability of the money multiplier and money demand can lead to the breakdown of the link between BNR operating target (base money) and intermediate target (M3) on one side, and, between the intermediate target and the final objective of monetary policy (inflation).

Therefore, this paper focuses on reviewing the monetary policy and financial innovations between 2004 and 2015. This study aims at raising more awareness on the need for more effective policies that can lead to improvements in the monetary situation in Rwanda.

II. Literature Review

This section gives brief theoretical and empirical work on financial innovations and their impacts across nations.

2.2 Empirical Literature review

Much of the literature focuses on the impact of monetary policy on inflation levels and inflation volatility, and sometimes on output (GDP) levels and volatility of output. However, some literature has focused on the relationship between financial innovation on monetary variables such as money demand. Kovanen (2004) used Granger causality and VAR methodologies to examine the determinants of currency demand and inflation dynamics. The study measured a proxy of financial innovation as the ratio of broad money to currency. The results from the VAR estimation for financial innovation were found not to be significant. The same results were recorded in a study by Sichei and Kamau (2012) who conducted a similar study in Kenya but the number of ATMs was used as a proxy for financial innovations. Insignificant effects are likely as a result of the used proxy for financial innovation that is not widely used in the country. Lungu et al (2012) also conducted a same study for Malawi and in this case, financial innovation showed a significant effect on the demand for money in the short term.

Within a small New-Keynesian FPAS (forecasting and policy analysis system) model Dizioli and Schmittmann (2015) derive an optimal monetary policy rule that minimizes variability of output, inflation, and exchange rates in Vietnam. The empirical method of the study includes Bayesian estimation techniques using annual data between 2000 and 2014. An important finding is that its optimal rule model places a larger weight on output stabilization as the intermediate target to achieve inflation stability (in addition to allowing greater exchange rate flexibility). Currently in Vietnam, as the paper suggests, monetary policy is anchored around exchange rate stability as the intermediate target to achieve price stability. Under cases of shock, the authors suggest that this model of monetary policy rule delivers greater macroeconomic stability for the country. Besides, the baseline parameterization fits the actual data closely and performs well in within-sample forecasts.

Ahmed and Islam (2004) empirically investigated whether bank lending and exchange rate channels exist in Bangladesh through which monetary policy changes can influence aggregate output and prices. Using a VAR approach and quarterly data for the period between July-September 1979 and April-June 2005, the authors show that both channels are weak in Bangladesh. The results are not surprising particularly for the period investigated as the impact of openness of Bangladesh's economy and development of the financial sector is felt at a much later period. One methodological problem with the article is that the application of VAR creates possible losses of degrees of freedom when more lagged variables are included in the 2004 regressions. Besides, most of the impulse responses depicted in the paper suffer from a lack of significance as noted from the confidence intervals.

In a cross-country setting Primus (2016) examines the relative effectiveness of the use of indirect and direct monetary policy instruments in Barbados, Jamaica, and Trinidad and Tobago. The study employs a restricted Vector Autoregressive model with Exogenous variables (VARX). The underlying assumption of the paper is that the central bank conducts monetary policy using a Taylor-type rule and it evaluates the effects of a reserve requirement policy. The results show that although a positive shock to the policy interest rate has a direct effect on commercial banks' interest rates, there is weak transmission to the real variables. Moreover, an increase in the required reserve ratio is successful in reducing private sector credit and excess reserves, while at the same time alleviating pressures on the exchange rate. The findings, therefore, indicate that central banks in small open economies should consider using reserve requirements as a complement to interest rate policy, to achieve their macroeconomic objectives.

In a recent panel study, Choi et al. (2018) test the claim that low inflation and anchoring of inflation expectations are good for economic growth. Their empirical investigation employs panel IV estimations technique using panel data on sectoral growth for 22 manufacturing industries for 36 advanced and emerging market economies over the period 1990-2014. The paper uses as a dependent variable the average industry growth rate over the period 1990-2014 as a function of the share of each industry in total manufacturing output in 1990, and a measure of "inflation anchoring". The findings from the research reveal that credit-constrained industries – those characterized by high external financial dependence and R&D intensity and low asset tangibility tend to grow faster in countries with well-anchored inflation expectations. The authors suggest that it is inflation anchoring and not the level of inflation, itself, which has a significant effect on average industry growth.

III. Methodology

a. Study Area

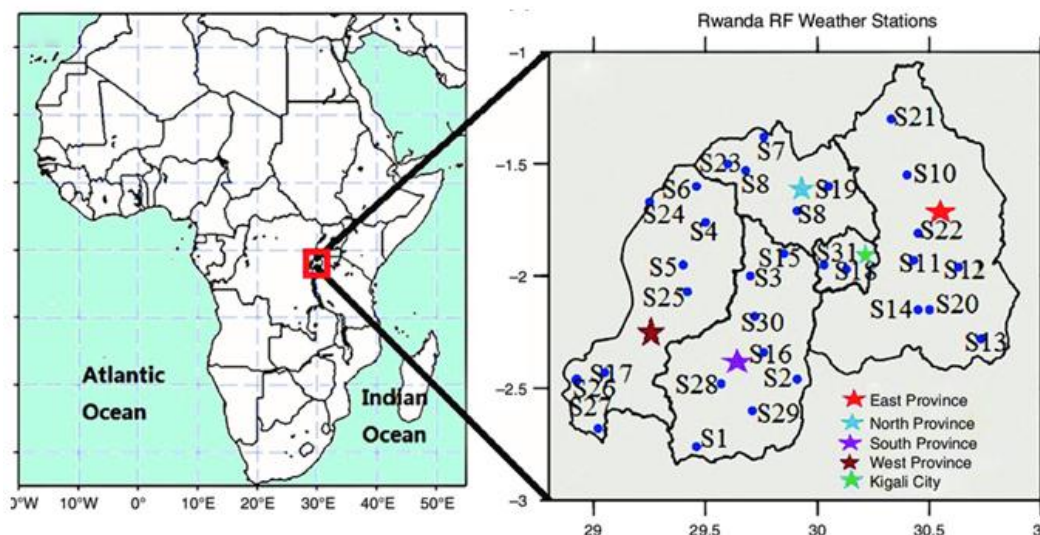


Figure 3.1: Location of Rwanda

Rwanda is bordered by Uganda, Tanzania, Burundi, and the Democratic Republic of the Congo. It is in the African Great Lakes region and is highly elevated; its geography is dominated by mountains in the west and savanna to the east, with numerous lakes throughout the country. The climate is temperate to subtropical, with two rainy seasons and two dry seasons each year. Rwanda has a population of over 12.6 million living on 26,338 sq. km of land, and therefore it is the most densely populated mainland African country (UN, 2019).

b. Conceptual Framework

This part of the conceptual framework shows and presents the financial innovations and expected impacts. A conceptual framework is an analytical tool with several variations and contexts. It is used to make conceptual distinctions and organize ideas.

Table 3.1: Policy Frameworks under study

FINANCIAL INNOVATIONS USED IN RWANDA	EXPECTED IMPACT
I. The establishment of UMURENGE SACCOs in 2009.	Financial Inclusion Improvements
I. Establishment of at least one financial institution in each sector (UMURENGE) country-wide.	Widening and Deepening Financial Inclusion
I. Modernization in the financial supervisory framework, high growth in economic activities as well as conducive business environment.	Ratios of deposits and credit to private sector increases
/. Rwanda have facilitated the entry of regional banks in Rwanda as well as the extension of the banking sector network across the country through bank branches and agent banking.	Increased competition in the banking sector (moderation of bank concentrations)
/. Introduction of Automated Teller machines, mobile banking and internet banking.	Increased number and volume of transactions
I. Creation of capital market in 2008.	Alternative Savings and Institutional Investments Increase

Source: Author 2019

c. Methodology

The study is a policy review paper, it employed document review and analysis. This method allowed us to analyze policies and their impacts or relevance. Policy analysis provides a way for understanding how and why governments enact certain policies, and their effects (Jennifer et al., 2018). The study investigated the monetary policy and whether financial innovations have impacted on money demand and the monetary policy transmission mechanism in Rwanda from the period 2004-2015.

IV. Results and Discussion

4.1 Overview of financial innovations and monetary policy in Rwanda

This section discusses financial innovations that have taken place in Rwanda during the last decade and the effects thereof these had on the financial system and monetary aggregates. The following six innovations were implemented according to RBR (2016).

- I. The establishment of UMURENGE SACCOs in 2009.
- II. Establishment of at least one financial institution in each sector (UMURENGE) country-wide.
- III. Modernization in the financial supervisory framework, high growth in economic activities as well as conducive business environment.
- IV. Rwanda have facilitated the entry of regional banks in Rwanda as well as the extension of the banking sector network across the country through bank branches and agent banking.
- V. Introduction of Automated Teller machines, mobile banking and internet banking. Another important change in the financial system in Rwanda was the creation of capital market in 2008.
- VI. Creation of capital market in 2008.

The impacts of the above financial innovations or interventions are wide and detailed. The coming UMURENGE SACCOs improved the financial inclusion, and according to RBR (2016) reports, around 52% of sectors were without any financial institution. Access to financial services and products was deepened and widened by the creation of bank branches and agent banking across the nation. The total network increased from 408 in 2011 to 3,085 in 2015 as shown in **Table 4.1 below**. These innovations and developments contributed to increased competition in the banking sector as indicated by the Herfindahl- Hirschman Index (HHI) (RBR, 2016). According to Kigabo (2014) these interventions brought competition in the Rwandan banking sector between 2002 and 2009, and the sector improved from high concentration to moderate concentration since 2010.

Following the above mentioned financial innovations, the number of ATMs nearly doubled from 167 machines in 2011 to 280 in 2015 while the number of transactions using ATM and POs merchants nearly quadrupled to 7.5 million from 1.9 million and to 373,029 from 38,440 respectively from 2011 and 2015. In the same period, the number of transactions using mobile payments, mobile banking and internet banking increased to 168.6 million, 5.6 million and 556,152 respectively from 4.3 million, 527,300 and 1,493.

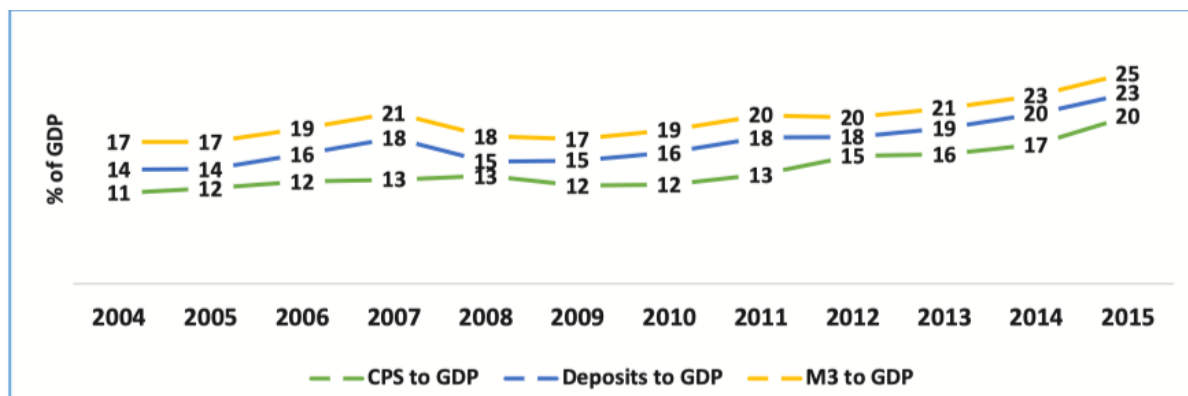
Currency in circulation (CIC) as a percentage of M3 has significantly dropped from 27.3% in 2008 to 9.6% in 2015 which contributed to having more deposits in the banking sector and to the increase in commercial bank loans to the private sector. As shown in **Figure 4.1 below**, ratios of deposits and credit to the private sector (CPS) to GDP increased respectively to 23 percent and 20 percent in 2015 from 14 percent and 11 percent in 2004. Moreover, the ratio of broad money (M3) to GDP which stood at 17 percent in 2006 increased to approximately 25 percent in 2015.

Although, the market remains nascent, it is becoming progressively active since 2014 after BNR and MINECOFIN decided to issue treasury bonds quarterly. This offered an alternative way of saving for non-bank savers. The share of retail investors in Government bonds has increased from almost 0% in 2013 to 15% in May 2016. During the same period, the ratio for institutional investors increased from 10% to 50.34% while the share of commercial banks declined from 90% to 35%.

Table 4.1: Bank branches and outlets

Year	2011	2012	2013	2014	2015
Total branches & outlets	408	438	471	515	530
BANKS&apos; AGENTS	0	844	2,047	2,499	2,555
Total Network	408	1,282	2,518	3,014	3,085

Source: BNR, Financial Stability Directorate



Source: BNR, Financial Stability Directorate

Figure 4. 1: Trends on Financial Depth in Rwanda

4.2 Conclusion

This study aimed to analyze financial innovations formulated by the National Bank of Rwanda in line with its monetary policy. The developments/financial innovations presented in this study and the impacts realized indicate that the financial environment in which BNR conducts its monetary operations, as well as the financial behavior of economic agents, has been positively impacted. The study noted that financial inclusion widened and deepened, ratios of deposits and credit to the private sector increased, the banking sector became competitive, the number and volume of transactions increased and alternative savings through treasury bills were introduced for the betterment of the banking sector and the economy at large. Regional banks also came in as a result of the fairly stable banking sector.

References

- [1]. Ahmed, S. & Islam, M. E. 2004. The monetary transmission mechanism in Bangladesh: bank lending and exchange rate channels. *The Bangladesh Development Studies*, 30, 31-87.
- [2]. Blackmore, J. and Lauder, H. (2005). *Researching policy*. In Somekh, B. and Lewin, C. (eds), *Research Methods in the Social Sciences*. Sage, London.
- [3]. Choi, S., Furceri, D. & Loungani, P. 2018. Inflation anchoring and growth: evidence from sectoral data. *IMF Working Paper*, 18, 1-37.
- [4]. Dizioli, A. & Schmittmann, J. M. 2015. A macro-model approach to monetary policy analysis and forecasting for Vietnam. *IMF Working Paper*, 15, 1-25.
- [5]. Esman, M. N., & Kebede, T. (2013). The effect of governance on performance of commercial banks in Kenya: a panel study. *Corporate Governance: The International Journal of Business in Society*, 13(3), 236–248. <https://doi.org/10.1108/CG-12-2010-0107>
- [6]. https://population.un.org/wpp/Publications/Files/WPP2019_DataBooklet.pdf
- [7]. IMF (2015a). *Evolving Monetary Policy Frameworks in Low-Income and other Developing Countries*
- [8]. Jennifer Browne, Brian Coffey, Kay Cook, Sarah Meiklejohn, and Claire Palermo (2018). *A guide to policy analysis as a research method*.
- [9]. Kigabo, T.R. (2015). Monetary and Financial Innovations and Stability of Money Multiplier in Rwanda. *Issues in Business Management and Economics*, 3 (1), 1- 8. 15.
- [10]. Kovanen, A. (2004). Zimbabwe: A quest for a Nominal Anchor. *IMF Working Paper WP/04/130*. July 2004.
- [11]. Lungu, M., Simwaka, K., Chiumia, A., Palamuleni, A and Jombo, W. (2012). Money demand function for malawi- implications for monetary policy conduct. *Banks and Bank Systems*, 7(1)
- [12]. National Bank of RWANDA (2016). *BNR Economic Review Vol. 9*.
- [13]. Nell, E and Forstater, M. (2003). *Reinventing Functional Finance: Transformational Growth and Full Employment*
- [14]. P.N. (Raja) Junankar (2019). *Monetary Policy, Growth and Employment in Developing Areas: A Review of the Literature*
- [15]. Primus, K. 2016. The effectiveness of monetary policy in small open economies: an empirical investigation. *IMF Working Paper*, 16, 1-39.
- [16]. Richard Lipsey & Murray Smith, 2010. "Multilateral Versus Regional Trading Arrangements: Substitutes Or Compliments?," *Discussion Papers dp10-03*, Department of Economics, Simon Fraser University.
- [17]. Rutayisire, M. J. (2013), "Threshold effects in the relationship between inflation and economic growth: Evidence from Rwanda", *African Economic Research Consortium (AERC)*, 1-33.
- [18]. Rutayisire, M and Umubyeyi, A. (2013). ... 'Mutual Health Insurance in Rwanda: Evidence on Access to Care and Financial Risk Protection', *Health Policy*, 99(3): 203–9.
- [19]. Sayinzoga A. and Simson, R.(2006). Monetary policy in Rwanda: A cointegration analysis. *South African Journal of Economics* 74(1):65-78.DOE: 10.1111/j.1813-6982.2006.00049.x
- [20]. Sichei, M and Kama, A.W. (2012). Demand for money: Implications for the Conduct of Monetary Policy in Kenya . *International Journal of Economics and Finance* ,4(8), 72-82.
- [21]. UN, (2019), *World Population Prospects 2019*.
- [22]. United Nations. (2019). *World Population Prospects*. Department of Economic and Social Affairs, Population Division
- [23]. *World Development Report 2008 : Agriculture for Development*. Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/5990> License: CC BY 3.0 IGO."