International Journal of Economics, Business and Management Research

Vol. 8, No.11; 2024

ISSN: 2456-7760

Functioning of the Money Market in the DRC: An Exploratory Analysis

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doi.org/10.51505/IJEBMR.2024.81118 URL: https://doi.org/10.51505/IJEBMR.2024.81118

Received: Oct 14, 2024 Accepted: Oct 23, 2024 Online Published: Nov 29, 2024

Abstract
The objective of this article is to analyze the factors that influence the functioning of the money market in the DRC in order to determine its characteristics. To achieve this objective, we used exploratory data analysis. The results obtained highlight the existence of imbalances and the high volatility characterizing the Congolese money market, with a very variable money supply and growth rate, unstable interest rates, and persistent inflationary pressures despite a relative stability in economic growth. The monetary policies of the BCC, the dynamics of growth, and inflationary tensions influence the functioning of the money market in the DRC.

Keywords: Money market, volatility, inflation

1. Introduction

Money markets are markets where funds are lent and borrowed for periods ranging from a few days to one year, primarily through interbank loans (DEES S., 2019). They play a crucial role in the short-term financing of the economy and monetary policy by central banks.

In the Democratic Republic of the Congo (DRC), the money market has undergone significant changes in recent years, reflecting the economic and political challenges faced by the country. Several studies have examined the functioning of this market, highlighting its characteristics and issues.

Research conducted by the Central Bank of Congo (BCC) (BCC, 2020, 2021) and economic research institutions has shown that the money market in the DRC is characterized by high dollarization, high volatility of exchange rates, and limited banking liquidity. The confidence of economic agents in the national currency, the Congolese franc (CDF), remains weak, with economic operators favoring the use of the US dollar (USD) for transactions (Tshibangu, 2018; Matadi, 2019). This dollarization of the economy poses significant challenges for the conduct of monetary policy by the BCC.

Furthermore, studies have also highlighted the impact of armed conflicts, political instability, and weak institutions on the functioning of the monetary market in the DRC (Mukendi, 2021;

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Mbuyi, 2022). These factors contribute to increasing uncertainty and undermining the confidence of actors in the national currency.

Indeed, the banking sector plays a key role because everything goes through banks, which finance the operations of economic agents. Since the financial situation of the DRC is not integrated into the global context, most transactions take place within one compartment of the banking sector, namely the monetary market. This market occupies an important place in the country's economy as it is central to financing and refinancing operations between commercial banks and the Central Bank (Katusi, 2020).

In this context, a thorough analysis of the functioning of the monetary market in the DRC is necessary to better understand the dynamics that characterize it and to identify potential levers for action to strengthen its efficiency and the stability of the national financial system. The objective of this article is to analyze the factors that influence the functioning of the money market in the DRC in order to determine its characteristics. The specificity of this study lies in the use of exploratory data analysis (EDA) to examine the monetary market in the DRC, taking into account macroeconomic parameters, notably the inflation rate and economic growth.
The rest of this paper is organized around four essential points: the literature review, methodology, results and conclusion.

2. Literature Review

According to Mishkin F. S. (2016), the money market is where short-term, highly liquid, and high-quality debt instruments are traded, such as treasury bills, commercial papers, and certificates of deposit. For Olivier Blanchard (2017), the money market is the market for short-term financial assets, such as treasury bills and certificates of deposit. It is an important market for the short-term financing of businesses and governments, as well as for liquidity management by banks. These definitions highlight the importance of analyzing the functioning of such a market. However, several studies have been conducted to analyze the functioning of the money market in the DRC and in other emerging and developed countries. In our study, we reference the following empirical works:

A study conducted by the BCC (2019) showed that the money market in the DRC suffers from low liquidity, fragmentation, and lack of transparency. Nkusu M. and Salanie F. (2016) emphasized the importance of reserve requirements, the BCC's key interest rate, and political stability for the proper functioning of the money market in the DRC. Meanwhile, Mabali B. and Mabika C. (2018) demonstrated in their study the limitations of monetary policy transmission via the interest rate due to the underdevelopment of the Congolese money market. They highlighted that the weakness of economic activity in the DRC negatively affects the transmission of monetary policy. Similar results were obtained by Oshikoya and Ogbu (2018) in the case of Nigeria, indicating that fluctuations in economic activity affect the dynamics of the money market.

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In their study on the dynamics of the Nigerian money market, Oshikoya T. and Ogbu O. (2018) highlighted the importance of the exchange rate, foreign reserves, and inflation for the dynamics of the money market. Similar results were obtained by Mpanzu and Kibala (2020) in the case of the DRC. They emphasized the predominant role of the exchange rate in the dynamics of inflation in the DRC, which indirectly affects the money market. Likewise, Devarajan and Giugale (2013) conducted a study on several Sub-Saharan African countries, including the DRC. The results revealed that exchange rate volatility hampers the effectiveness of monetary policy. Ngalawa and Viegi (2011) showed, in the case of Malawi, that monetary policy shocks have a significant impact on production, influencing the functioning of the money market. Mpanzu and Kibala (2020) demonstrated that inflation negatively affects the transmission of monetary policy in the DRC, limiting the operation of the money market. Nkusu and Salanié (2016) also stress the importance of price stability to ensure the credibility of monetary policy and the proper functioning of the money market. Another study by Barnichon and Peiris (2008) on several Sub-Saharan African countries indicated that controlling inflation is essential for the development of financial markets, including the money market.

3. Methodology

3.1. Data and sources

The data used in this research is drawn from various reports of the BCC covering the period from 2015 to 2022. The choice of the 2015-2022 period is justified by the specific economic and monetary issues during this time in the country, the availability of data, its relevance to the current situation, and the possibility of international comparisons over a recent and coherent period. This analysis period will provide significant and actionable results to enhance the understanding of the Congolese money market. The data primarily focuses on key variables of the money market and macroeconomic variables that may influence the functioning of the money market.

3.2. Presentation of selected variables

For a thorough analysis of the functioning of the money market in the DRC, we have selected the following variables: the key interest rate of the BCC, the money supply, the average interbank interest rate, the inflation rate, and the economic growth rate.

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Table1: Operationalization of Variables

Variables	Définition opérationnelle	Indicateur de mesure	Code
Key interest rate of BCC :	The interest rate at which the BCC conducts its refinancing operations with commercial banks	Interventio n rate of the BCC	KIR
Monetarysupply :	The money supply in circulation, that is, the means of payment available in the market.	Money supply in the strict sense	M1
Interbank interest rate:	The interest rate applied to short-term lending and borrowing operations between commercial banks in the money market..	Averageint erbankinte rest rate	AIR
Inflation rate :	Change in the consumer price index	Consumer price index	INFLR
Economic growth rate :	The level of overall economic activity	Gross Domestic Product	EGR

Source: Authors

3.3. Analysismethod

To analyze the collected data, we will use descriptive statistics, which will allow us to summarize the characteristics of our data. Then, we will analyze the correlations between different variables to identify potential associations. Wewillproceed with an Exploratory Data Analysis (EDA).

4. Results and discussions

4.1. Results

Tableau 2. Descriptives statistics

	M1	AIR	KIR	M1GR	EGR	INFLR
Mean	2768364	8.8	10.8	124.9	5.0	14.6
Median	2001755	6.7	8.6	26.0	5.1	8.6
Maximum	7811868	21.5	20.0	952.0	8.9	53.5
Minimum	1073431	1.7	2.0	-86.0	1.7	1.4
Std. Dev.	2192729	6.7	6.2	336.4	2.4	16.8
Skewness	1.7	0.8	0.3	2.2	0.1	1.8
Kurtosis	4.7	2.6	1.9	6.0	2.0	4.8
Jarque-Bera	4.8	1.0	0.5	9.5	0.4	5.2
Probability	0.1	0.6	0.8	0.0	0.8	0.1

Source: Authors, based on data taken from various BCC reports

Table 2 indicates that the average money supply stands at 2,768,364 million CDF, with a median of 2,001,755 million, showing an overall increase in monetary liquidity during the period. The high standard deviation of 2,192,729 million indicates significant volatility in the money supply. The positive skewness coefficient of 1.7 suggests an asymmetric distribution with a tail extending to the right, meaning that higher values are more frequent.

The average growth rate of the money supply is 124.9%, with a much lower median of 26%, revealing strong variability. The maximum of 952% and the minimum of -86% indicate extreme volatility in the money supply growth rate. The high skewness coefficient of 2.2 suggests an asymmetric distribution with a tail extending to the right.

The average economic growth rate is 5%, with a similar median of 5.1%, reflecting relative stability. The moderate standard deviation of 2.4% shows lower volatility compared to other indicators. The distribution is symmetrical, with a very low skewness coefficient of 0.1. The average interbank interest rate is 8.8%, with a median of 6.7%, indicating some instability in rates. The maximum of 21.5% and the minimum of 1.7% demonstrate high volatility in the average interbank rate. The distribution is relatively symmetrical, with a moderate skewness coefficient of 0.8.

The key interest rate is 10.8%, with a median of 8.6%, indicating frequent adjustments of rates by the central bank. The standard deviation of 6.2% highlights the extent of variations in the key interest rate. The distribution is rather symmetrical, with a low skewness coefficient of 0.3. The average inflation rate stands at 14.6%, with a lower median of 8.6%, underscoring significant inflationary pressures. The maximum of 53.5% and the minimum of 1.4% reveal high price volatility. The positive skewness coefficient of 1.8 indicates an asymmetric distribution with a tail extending to the right.

In summary, this table highlights the imbalances and high volatility characterizing the Congolese money market, with a highly variable money supply and money supply growth rate, unstable interest rates, and persistent inflationary pressures despite relative stability in economic growth. These dynamics reflect the major challenges faced by monetary policy in the DRC.

Table 3: Correlation matrix

	M1	AIR	KIR	EGR	INFLR
M1	1	-0.4040574	-0.62558171	0.54894436	-0.42358385
AIR	-0.4040574	1	0.92072999	-0.47514133	0.57358472
KIR	-0.62558171	0.92072999	1	-0.5235272	0.79049687
EGR	0.54894436	-0.47514133	-0.5235272	1	-0.26794198
INFLR	-0.42358385	0.57358472	0.79049687	-0.26794198	1

Source: Authors, based on the results of the estimations

The results of Table 3 indicate that the money supply has a weak negative correlation (-0.404) with the average interbank rate and a strong negative correlation (-0.626) with the key interest

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rate. It has a moderate positive correlation (0.549) with the economic growth rate, but a weak negative correlation (-0.424) with the inflation rate. The average interbank rate has a very strong positive correlation (0.921) with the key interest rate. It has a weak negative correlation (-0.475) with the economic growth rate, but a moderate positive correlation (0.574) with the inflation rate. The key interest rate has a very strong positive correlation (0.921) with the average interbank rate. It has a moderate negative correlation (-0.524) with the economic growth rate, but a strong positive correlation (0.790) with the inflation rate. The economic growth rate has a weak negative correlation with the average interbank rate (-0.475) and the inflation rate (-0.268), while its negative correlation with the key interest rate appears moderate (-0.524).

In summary, this correlation matrix shows complex relationships between the various monetary and economic variables in the DRC. It notably suggests tensions between the objectives of controlling inflation, supporting growth, and regulating the money supply, which may pose challenges for conducting monetary policy in the country.

4.2. Discussion of results

In light of the results obtained, we can make the following observations about the functioning of the money market in the DRC:

(i). High Volatility: Significant and frequent fluctuations in the key interest rate and the interbank rate indicate considerable volatility in the Congolese money market. This instability reflects the BCC's difficulties in ensuring stable and consistent monetary management in a likely very uncertain economic environment.

(ii). Recurring Liquidity Tensions: Episodes of sharp increases in the interbank rate, reaching very high levels (15.17% in 2017 and 21.5% in 2020), indicate recurring liquidity tensions in the Congolese banking system. These liquidity tensions may be linked to structural funding issues for banks, pressures on foreign reserves, or economic shocks.

(iii). Challenges in Controlling Inflation: Phases of monetary tightening marked by increases in the key interest rate (in 2016, 2017, 2020, and 2022) suggest that the BCC has had to face significant inflationary pressures. The need to regularly resort to tightening monetary policy indicates difficulties in sustainably controlling inflation in the DRC.

(iv). Lack of Stability and Predictability: The frequent alternation between periods of monetary easing and tightening undermines the stability and predictability of the monetary policy framework. This can weaken the confidence of economic agents and complicate investment and financing decisions in the economy.

(v). Negative Relationship Between Money Supply and Interest Rates: The negative correlation between the money supply and interest rates (both interbank and key rates) suggests that the central bank resorts to rate hikes to try to reduce liquidity in the economy. However, the effectiveness of this approach appears limited, as indicated by the high volatility of the money supply.

(vi). Contrasting Impact of Monetary Policy on Inflation: While interest rates (interbank and key rates) are positively correlated with inflation, the money supply is negatively correlated with inflation. This suggests difficulties for the BCC in consistently using its various monetary policy instruments to sustainably control inflationary pressures.

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(vii). Tensions Between Growth and Price Stability Objectives: The positive correlation between the money supply and economic growth, but negative with inflation, indicates complex trade-offs for the BCC between these two objectives. Monetary policy appears to have asymmetric effects, favoring growth more than price stability.
(viii). Ambiguous Role of Interest Rates: Interest rates (interbank and key rates) are positively correlated with each other but have opposing relationships with the money supply and inflation. This likely reflects difficulties for the BCC in effectively using these instruments to achieve its objectives.

Overall, the functioning of the Congolese money market is characterized by high volatility, recurring liquidity tensions, and persistent challenges in controlling inflation. This underscores the significant efforts that remain to be made to strengthen the stability and effectiveness of monetary policy in the DRC.

5. Conclusion

In conclusion, we note that the money market in the DRC is characterized by significant instability in the money supply and interest rates, as well as extreme volatility in the money supply growth rate, within a context of persistent inflationary pressures despite relatively stable economic growth. These dynamics reflect the major challenges faced by monetary policy in the DRC.

The correlation analysis has highlighted the challenges confronting monetary policy in the DRC, with complex trade-offs between different objectives and limited effectiveness of conventional instruments. This underscores the need for the BCC to adapt its strategy and tools to better control monetary aggregates and regulate inflationary tensions while supporting economic growth.

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