

ASSOCIATION DES BANQUES CENTRALES AFRICAINES



ASSOCIATION OF AFRICAN CENTRAL BANKS

ASSOCIATION OF AFRICAN CENTRAL BANKS (AACB)

46th ANNUAL MEETINGS

(Le Meridien Hotel, Mauritius, August 30 to September 4, 2024)

2024 AACB SYMPOSIUM ON THE THEME:

"USING BIG DATA ANALYSIS, INTEREST RATES, AND ARTIFICIAL INTELLIGENCE IN THE FIGHT AGAINST INFLATION"

(Le Meridien Hotel, Mauritius, September 3, 2024)

REPORT

ACRONYMS

AACB: Association of African Central Banks

AfCFTA: African Continental Free Trade Area

AI: Artificial Intelligence

AMCP: African Monetary Cooperation Program

AU: African Union

AUC: African Union Commission

BAM: Bank Al-Maghrib

BCEAO: Banque Centrale des États de l'Afrique de l'Ouest

BEAC : Banque des États de l'Afrique Centrale

BIS: Bank for International Settlements

BoZ: Bank of Zambia

CBG: Central Bank of The Gambia

CBN: Central Bank of Nigeria

CER: Regional Economic Community

CSI: Integrated Strategic Framework

EAC: East African Community

ECB - European Central Bank

ECOWAS: Economic Community of West African States

Fed: US Federal Reserve

FinTech: Financial Technology

GDP: Gross Domestic Product

IMF: International Monetary Fund

IRP: Interest Rate Parity

MASI: Moroccan All Shares Index

MEFMI: Macroeconomic and Financial Management Institute of Eastern and Southern Africa

ML: Machine Learning

NBR: National Bank of Rwanda

RBZ: Reserve Bank of Zimbabwe

SARB: South African Reserve Bank

SSA: Sub-Saharan Africa

STC: Specialized Technical Committee

WAEMU: West African Economic and Monetary Union

EXECUTIVE SUMMARY

The 2024 AACB Governors' Symposium was held on September 3, 2024, at Le Meridien Hotel, Mauritius. It aimed to promote exchanges between Central Bank Governors, policymakers, international institutions, and academia on Central Banks' use of big data, interest rates, and artificial intelligence to monitor, predict, and control inflation. The work of the Symposium took place in four (4) plenary sessions on the following themes:

1. Raising Key Interest Rates to Fight Against Inflation: Is This Enough for African Central Banks? What are the Implications for Financial Stability?
2. Leveraging FinTechs and Artificial Intelligence in the Fight Against Inflation;
3. Risks and Opportunities for Using Big Data Analytics and Artificial Intelligence in Forecasting Inflation and Monetary Policy Decisions; and
4. Sharing Experiences Relevant to the Main Theme of the Symposium.

The sessions were moderated by Governors and Experts, followed by panel discussions.

In recent decades, the world economy has experienced increasing instability due to various events contributing to the deterioration of the economic and financial conditions of States. These shocks have caused major macroeconomic effects, including widespread inflation. In this volatile context, the fight against inflation has been a priority for Central Banks, which have played a key role in adjusting interest rates as part of monetary policies to maintain price stability, while at the same time, preserving economic growth. Central Banks must also take into account external factors, such as commodity fluctuations and global economic shocks.

Traditional economic models have sometimes proved limited in effectively anticipating the inflation rate, which has highlighted the need for more relevant and quickly accessible data. In this regard, Central Banks are increasingly using innovative tools such as big data and artificial intelligence to better analyze consumer behaviors and economic trends. Big data, with its characteristics of volume, variety, and velocity, provides a better understanding of economic dynamics in real time. Artificial intelligence, on the other hand, improves forecasting models and helps anticipate economic decisions while increasing the effectiveness of monetary policy.

These technologies offer significant potential to improve financial stability and the effectiveness of Central Banks' actions. For example, the use of artificial intelligence to classify millions of entities or monitor prices online makes it possible to better adjust economic policies. However, these innovations present challenges related to data quality and potential risks. Central Banks must continue to assess these risks, including the use of Deep Learning to prevent artificial intelligence from contributing to amplifying crises.

The use of emerging technologies, such as big data and artificial intelligence is becoming essential for Central Banks. These tools enable to anticipate economic risks, monitor developments in real time, and strengthen financial stability. In a rapidly changing global economic context, technological innovation represents a crucial way to ensure optimal inflation management and sustainable economic prosperity.

At the end of the Symposium, the following main recommendations were made:

1. More than monetary policy is needed to achieve the objectives assigned to Central Banks, especially in the presence of exogenous shocks. In this regard, it is important to ensure coordination of monetary and fiscal policies;
2. Central Banks' decisions must be accompanied by clear and precise communication to ensure better effectiveness of monetary policy transmission mechanisms;
3. A coordinated approach is needed to implement the innovations offered by big data and artificial intelligence responsibly, focusing on financial stability, consumer interests, and sustainable growth;

4. A balanced approach is needed, requiring more research, collaboration, knowledge sharing, and best practices to maximize the benefits of these technologies;
5. However, it is important to pay attention to challenges such as algorithmic bias, concerns about data privacy, misleading forecasts and the need for strong governance, regulatory frameworks, and ethical foundations;
6. Central Banks must proactively and informedly engage with current technological advances, including by fully exploiting the potential of big data and artificial intelligence, while controlling the associated risks;
7. The AACB member Central Banks must capitalize on shared experiences and strive to innovate relentlessly in a cooperative framework.

1. INTRODUCTION

The Bank of Mauritius organized, on September 3, 2024, at Le Meridien Hotel, Mauritius, the Governors' Symposium of the Association of African Central Banks (AACB) on the theme *"Using Big Data Analysis, Interest Rates, and Artificial Intelligence in the Fight against Inflation"*, as a prelude to the 46th ordinary meeting of the Assembly of Governors held on September 4, 2024. One hundred and forty (140) participants (see Appendix) attended the Symposium, including Governors and senior managers of Central Banks, as well as senior officials from partner institutions, regional and international organizations, to exchange views on, among other things, the use by Central Banks of big data, interest rates, and artificial intelligence to monitor, predict, and control inflation. Papers, followed by in-depth discussions, were presented by resource persons (Governors and Presenters). This report presents a summary of the work of the Symposium.

2. OPENING CEREMONY

The opening ceremony was marked by four (4) speeches which were delivered respectively by Mr. Harvesh Kumar Seegolam, G.C.S.K, Honourable Governor of the Bank of Mauritius; Dr. Denny H. Kalyalya, Chairperson of the AACB and Honourable Governor of the Bank of Zambia (BoZ); Honourable Dr. Renganaden Padayachy, Minister of Finance, Economic Planning, and Development; and Hon. Pravind Kumar Jugnauth, Prime Minister of the Republic of Mauritius.

Mr. Seegolam began by welcoming all the participants to Mauritius. He said he was very honored to host the AACB Symposium of Governors and underscored the common will to promote the financial system to improve the continent's economic and financial stability.

The Honourable Governor of the Bank of Mauritius stressed that this meeting demonstrates a shared desire to improve the continent's financial system and promote financial stability, fostering economic stability and growth. As always, Mauritius, a country brimming with ideas and innovation, was delighted to host this crucial event to facilitate significant exchanges and partnerships that will impact the future of financial systems in Africa. Given the complexity of the global economic context, Central Banks were requested to continue to work together to develop sound financial frameworks that can withstand external shocks and foster sustainable development across the continent. Like Central Banks around the world, in the face of uncertainties that have emerged in recent years, including the COVID-19 pandemic, climate change, and geopolitical tensions, AACB member Central Banks steadily have remained resilient as usual. It is crucial to foresee a future for the African continent that boosts shared prosperity and sustainable growth by taking into account key considerations and well-integrated financial structures. Therefore, African Central Banks were encouraged to make progress in various topical areas such as the integration of payment systems, data collection and storage, as well as artificial intelligence.

In conclusion, the Honourable Governor of the Bank of Mauritius was convinced that the ideas and experiences that were to be shared during the Symposium would pave the way for strengthening the skills of African Central Banks in the field. Best practices would benefit the continent's financial system and economies, and the AACB will continue to play a critical role in this process.

After welcoming all participants to the Symposium, Dr. Kalyalya, Honourable AACB Chairperson, noted that the theme *"Using Big Data Analytics, Interest Rates, and Artificial Intelligence (AI) in the Fight Against Inflation"* was relevant and aligned with the current environment, especially for Central Bankers. The global economy has been facing many challenges, including persistently high inflation, which has compromised the conduct of monetary policy, especially with conventional tools, for many Central Banks.

Dr. Kalyalya pointed out that according to the assessment of the implementation status of the African Monetary Cooperation Program (AMCP) in 2023, the inflation criterion recorded the lowest compliance rate. One of the legitimate questions is how Central Banks can leverage

emerging technologies, including big data analytics and artificial intelligence, in policy and operational frameworks to effectively fulfill their mission of price stability, given the current context. This Symposium was an opportunity to exchange views and experiences on how Central Banks can effectively leverage available and emerging technologies to achieve and maintain price stability in the face of recurrent shocks. Topics to be addressed, such as how to balance the maintenance of price stability with financial stability, are at the heart of monetary policy discussions and decisions. In this regard, the use of big data, analysis tools offered by artificial intelligence, and Machine Learning are becoming essential for Central Banks to fulfill their mandate. In addition, to make effective decisions, it is necessary to have sound data and an in-depth analysis of the economy and inflation dynamics. Therefore, the potential use of big data, artificial intelligence, and the exploitation of FinTechs to measure and predict price developments will be essential for the implementation of appropriate monetary policy, improved price collection, and inflation expectations.

To conclude his remarks, the AACB Chairperson hoped that the results of the discussions would enlighten the member Central Banks on essential elements to effectively exploit big data and artificial intelligence. He urged Central Banks to take advantage of the use of big data and artificial intelligence to more accurately predict inflation and effectively address macroeconomic challenges.

Hon. Dr. Renganaden Padayachy expressed deep gratitude to the AACB for choosing Mauritius to host the 2024 Annual Meetings and highlighted the key role of Central Banks in the development of all countries.

He said that the Bank of Mauritius, one of the examples in this field since its creation in 1967, has accompanied the country at all stages of its economic and financial transformation. Following the diversification and liberalization of the Mauritian economy, the Bank of Mauritius has adapted its framework and policy accordingly, allowing the Mauritian economy to develop and be resilient to external shocks. The combination of the Bank of Mauritius' efforts and the Government's political decisions has enabled the country to have sustained growth (8.9 percent in 2022, 7.0 percent in 2023, and 6.5 percent in 2024) accompanied by job creation. This situation is attributable to the dynamism of several sectors, such as manufacturing, construction, tourism, and financial activities. Due to the inclusive policy pursued by the Government, the employment sector remains resilient, with an unemployment rate of 6.3 percent in 2023, the lowest level in 27 years. The Government of Mauritius is convinced that sustained inclusive growth gives more opportunities to the various economic actors. In this context, the banking industry and technological developments offer enormous opportunities for Mauritius and even for Africa. The theme of the 2024 AACB Governors' Symposium provides an opportunity to discuss the implications between artificial intelligence and business cycles for the continent's goals. Many countries have used monetary tightening to lower inflation by raising interest rates at the expense of financial inclusion, job preservation, and growth targets.

In conclusion, Dr. Padayachy urged Central Banks to integrate big data and artificial intelligence into their analytical tools to test and measure the potential effects of monetary policy decisions. However, these technologies remain tools and cannot replace human decisions.

Hon. Pravind Kumar Jugnauth, welcomed all participants to Port-Louis as part of the 46th AACB Annual Meetings. He stressed the importance and relevance of the theme of the 2024 Symposium in a context where economies are still facing the effects of various shocks and in the era of digital transformation. In this regard, he called on participants to learn from each other's experiences and to actively contribute to strengthening policy formulation and implementation in the context of shocks.

In addition, Hon. Jugnauth recalled that Central Banks played a crucial role in promoting confidence and economic stability, especially during crises such as the COVID-19 pandemic. During this period, they mobilized conventional and unconventional measures to protect the financial system and support the economy. As a member of the African Union, Mauritius has been closely observing the policies of Central Banks in their fight against inflation, a challenge

accentuated by geopolitical tensions and climate change. Since 2022, monetary tightening has been implemented, allowing the Bank of Mauritius to reduce inflation from 11.3 percent to 4.3 percent between February and July 2023. To effectively carry out their mission, AACB member Central Banks were urged to exploit the opportunities offered by digital technology and artificial intelligence. Integrating big data into their analytics is essential for effective monitoring of the economy. In addition, the development of innovative payment infrastructure, such as the unified payment interface between Mauritius and India, improves government services and facilitates transactions. Regional cooperation was highlighted to be crucial in setting up these systems, strengthening the mission of Central Banks in terms of confidence and transparency in the financial system.

In conclusion, the Honourable Prime Minister called on Central Banks to take advantage of current opportunities to improve the decision-making process, to enhance their expertise in big data analytics and their technical tools as well as the innovation hubs set up. He hoped that the deliberations would lead to wide-ranging and far-reaching discussions among the participants. He officially declared the work of the Symposium open.

3. KEYNOTE SPEAKER

In his opening remarks, Professor Andreas Dombret, Deputy Senior Research Fellow at Columbia University and former member of the Board of Directors of the Deutsche Bundesbank, indicated that recent events, such as the conflict between Russia and Ukraine, have caused global economic disruptions. The links observed between this conflict, the inflation rate, and interest rates were explained by Prof. Dombret, highlighting the relevance of the theme addressed at the Symposium on the effectiveness of using interest rates to control inflation.

Concerning the Russia-Ukraine conflict, he emphasized that the sanctions had not had the desired effect on the Russian economy. The country's GDP continues to grow, partially due to rising energy prices and Russia's transformation into a war economy. However, this GDP expansion is accompanied by economic weaknesses, notably with the devaluation of the rouble, although high interest rates supported the situation. This situation has prompted reflection on the emergence of a new world economic order shaped by geopolitical tensions and conflicts in which the world is divided into three (3) distinct blocs: the bloc composed of the West, the one dominated by Russia and supported by China, and the bloc of so-called 'neutral' nations. The relevance of the old format is being called into question as differences between member countries widen. Therefore, there is an urgent need to think about new platforms for discussions and global economic cooperation. The Russia-Ukraine conflict, although regional, has global repercussions that mark the end of what is sometimes called the 'peace dividend'. This concept, which has underpinned economic decisions in recent decades, is losing its relevance, and the world must adapt to this new reality where military tensions have a profound influence on economic dynamics.

The Speaker also addressed the challenges posed by inflation, explaining that inflation had already started before Russia invaded Ukraine, particularly in Europe. Indeed, in many European countries, inflation rates were already above the two (2) percent target. Traditional economic models failed to anticipate the magnitude of the inflationary crisis, highlighting the limitations of academic and traditional approaches to the complex and volatile reality of the current global economy. Inflation remains a major source of social inequality and tensions, particularly in services, where price increases are still significant.

Prof. Dombret also stressed the crucial importance of interest rates in managing inflation experienced over the period. For example, he pointed out that the European Central Bank (ECB), like other Central Banks, has raised interest rates several times since the invasion of Ukraine, marking a break from the past, to contain inflation. To this end, the inflation rate dropped from 10 percent in mid-2022 to 2.2 percent in June 2024. This tight monetary policy has been necessary to combat persistent inflation in the eurozone. However, this period is characterized by a reduction in the unemployment rate.

Finally, Prof. Dombret emphasized the importance of international cooperation in tackling global economic challenges. He called for better coordination between countries, while insisting on the need for a stronger commitment from the private sector in the search for solutions. The emphasis must be on local production and reducing international dependence, which is an inflationary source by nature. At the same time, the fight against inflation through interest rate hikes remains at the heart of the Central Banks' concerns. However, uncertainties persist regarding the evolution of the global geopolitical situation and its effects on inflation.

4. FIRST SESSION

4.1 Introduction

This session, focused on the theme "Raising Key Interest Rates to Fight Against Inflation: Is This Enough for African Central Banks? What are the Implications for Financial Stability?" was chaired by Dr. Kamau Thugge, Honourable Governor of the Central Bank of Kenya (CBK). The papers were presented by Fundi Tshazibana, Deputy Governor of the South African Reserve Bank (SARB) and Professor Natacha Valla, Dean of the School of Management and Innovation at Sciences Po. The panel was composed of Dr. Jean-Claude Kassi Brou, Honourable Governor of the Banque Centrale des États de l'Afrique de l'Ouest (BCEAO) and Mr. Abderrahim Bouazza, Deputy Governor of Bank Al-Maghrib (BAM).

4.2 Summary of presentations

The first presentation was made by Mrs. Tshazibana. In her presentation, addressing the concept of monetary policy based on the use of the short-term interest rate to regulate inflation, the Presenter questioned the relevance of this tool for African Central Banks and the consequences for financial stability based on the experience of South Africa.

Looking back at the experience of the SARB over the past three decades, the Presenter found that a modern approach to inflation targeting is effective and delivers better results than other frameworks. However, this approach requires other conditions, such as low levels of foreign currency debt, to work effectively. In addition, to ensure financial stability, a Central Bank must put in place micro and macroprudential regulation and foreign exchange reserves and intervene in the event of market failure. In sum, simplicity is essential in monetary policy, but prudent and diversified management is still necessary to ensure the sustainability of the financial system.

She said that the previous monetary policy frameworks had several shortcomings, namely:

- The difficulty of understanding the objectives of the SARB, making the reaction function opaque and posing problems for market participants and the SARB itself;
- The disappointing macroeconomic performance, with exchange rate instability and stagflation in South Africa;
- Complex frameworks that hampered transparency and accountability, weakening the case for Central Bank independence;
- The policy of intervention in the exchange rate has led to significant financial losses for taxpayers.

The SARB framework has been modernized with the adoption of inflation targeting and the independence of the Central Bank, bringing overall positive results in terms of inflation control and interest rate reductions.

The economy grew well in the 2000s. However, it slowed sharply in the 2010s. The exchange rate has been volatile, but this has not affected inflation expectations. The SARB's most significant mistake was to maintain an overly wide target range for 24 years, leading to higher inflation than its trading partners and negatively impacting competitiveness and the cost of living.

Despite this situation, the independent Central Bank with low and transparent inflation targets has shown its effectiveness. South Africa's experience in the mid-2000s highlighted the risks of

low inflation associated with rising financial vulnerabilities. Today, the SARB has more detailed tools at its disposal to supervise financial institutions and ensure system stability.

Monetary policy has evolved to include macroprudential tools, such as loan-to-value ratios. Regulations and financial supervision have also been strengthened, with the introduction of deposit insurance. The SARB has also changed its approach to foreign exchange reserves, as it no longer intervenes directly in the exchange rate.

The experience of South Africa shows the importance of an appropriate monetary policy and market regulation. The SARB strives to effectively supervise and regulate the financial system to ensure its stability and safety, while adapting to the challenges of the ever-changing global economic market.

To date, 95 percent of the balance sheet consists of foreign exchange reserves, making it the most important balance sheet policy. These reserves are held to serve as a "lender of last resort" of foreign currency in the event of a severe crisis and to maintain crucial imports when needed. They also help limit the negative effects of capital flows. In addition, these buffers strengthen the sovereign balance sheet, reducing risks to the country as a whole.

The Bank for International Settlements (BIS) highlighted foreign exchange reserves as a crucial factor in the resilience of emerging markets despite tighter global monetary conditions. In South Africa, foreign exchange reserves generated substantial profits despite the depreciation of the Rand. By investing part of these profits in the national treasury, the debt could be reduced.

In addition, the SARB is working on developing the soundness of financial markets, with a focus on developing high-quality benchmark rates, such as Zaronia, to ensure reliable and robust benchmarks.

Finally, the Presenter stressed that in terms of monetary policy, the SARB is aware of the need to have a framework to fight against market dysfunctions. Intervention is advocated only in key markets, such as government bonds, money, and foreign exchange markets, to keep the market functioning smoothly without manipulating prices. Thus, Central Banks need new tools to ensure financial stability in addition to the short-term interest rate. In South Africa, prudential regulation is important. Central Banks must continue to study the market to identify gaps and find solutions. They must remain focused on their mandate by having effective and simple tools and avoiding accumulating superfluous tools.

The second presentation was made by Prof. Natacha Valla. In her presentation, the Presenter stressed that the theme of the session remains relevant over time, as well as the key concerns about monetary policy, its effectiveness, and the role of Central Banks. It is essential for Central Banks to have independence and a well-developed monetary policy strategy supported by clear implementation tools and a robust transmission mechanism.

The key question is whether Central Banks should move interest rates to combat inflation. While this may seem like a simple question from a strategic perspective, the realities are actually much more complex. Its analysis will be organized around three (3) essential elements:

- Reflection on the current state of monetary policy due to recent history;
- Analysis of specific challenges and opportunities faced by Central Banks in African economies;
- Discussion on financial stability and its relationship with the Central Bank.

First, the Presenter noted that the course of global monetary policy has changed dramatically since the 2008 financial crisis. In the past, Central Banks, especially in Europe, had a strong focus on liquidity management and the regulation of short-term interest rates. However, the events of 2008 and, subsequently, the COVID-19 pandemic forced Central Banks to use a broader range of tools, such as forward guidance and quantitative easing, to preserve financial stability in an unprecedented economic environment.

She said that in Africa, despite their great diversity, African economies share many common constraints, including their vulnerability to external shocks and their dependence on commodity exports. In addition, changes in global interest rates and capital flows represent a major challenge for managing inflation and exchange rates. For example, in countries, such as Kenya, high interest rates in advanced economies have made it difficult to obtain financing, which has impacted public finances and the economy as a whole.

Finally, for Central Banks, it is important to maintain financial stability. African economies need deep and liquid domestic bond markets to cope with rising global interest rates. These markets ensure resilience to external shocks. The Presenter pointed out that the lack of a developed bond market in many countries weakens their ability to manage economic conditions effectively. This poses a challenge not only for Africa but also for more advanced regions, such as the European Union, facing persistent difficulties with a fragmented bond market.

In conclusion, the Presenter highlighted the issue of fiscal dominance in many African countries where Central Banks may not have the full autonomy required to carry out their missions effectively. Despite the difficulty of putting in place ideal monetary policies, African Central Banks can still boost confidence by managing inflation expectations and working to boost investor confidence. Financial stability and sound monetary policy are closely linked, and to achieve these goals, Central Banks and governments must join forces.

4.3 Summary of the panel discussions

The panel discussions were led by two Central Banks (BCEAO and BAM).

Like the rest of the world, WAEMU and Morocco have borne the brunt of the economic consequences of the exogenous shocks experienced in recent years and have resorted to interest rate hikes to combat the resulting inflation.

In the BCEAO's experience, raising policy rates, while essential to address persistent inflationary pressures, is not enough on its own to stabilize inflation, especially in Africa, where external factors, such as the weight of the informal sector, supply chain disruptions, and security crises are aggravating the situation. The complementarity between monetary policy and fiscal policies of member States has played a key role in reducing inflation in the WAEMU zone. Indeed, like sub-Saharan African countries, the WAEMU zone has faced inflationary pressures as a result of the COVID-19 pandemic. Inflation in the region peaked at 8.8 percent in August 2022, with an annual average of 7.4 percent compared to a historical average of around 2.0 percent. These pressures were mainly due to supply factors, such as a 13.2 percent decline in cereal production, security crises in the Sahel, and imported energy. In response, the BCEAO raised policy rates by 150 basis points to prevent second-round effects and anchor inflation expectations, leading to a slowdown in private sector lending, which fell from 14.4 percent in 2022 to 5.3 percent in June 2024. Amid tightening global financial conditions, governments also introduced targeted subsidies on essential goods at a fiscal cost of 2.2 percent of GDP in 2022, degrading their fiscal deficit to 6.9 percent of GDP compared to 2.3 percent in 2019.

In addition, the impact of the increase in policy rates on financial stability has highlighted liquidity and funding problems in the markets of WAEMU member States. The BCEAO has implemented actions aimed at stabilizing the regional financial market, such as intervention in the secondary market to buy back USD 3.3 billion in public securities (or 12 percent of the outstanding public securities held by banks). This intervention, partially sterilized by reduced liquidity injections, helped stabilize the regional financial market, secure economic financing and supported member States' ability to finance their cash flows. In this way, it has become possible to re-establish the rate hierarchy and prevent the risk of non-compliance by States, thus making it easier for them to issue Eurobonds.

To further strengthen the regional financial system (bank solvency ratio of 13.1 percent as of 1st quarter 2024), minimum capital requirements for banks have been doubled, banking laws have been updated, and a commission has been established to explore the use of artificial intelligence and big data to improve banking supervision and regulation. The BCEAO's objective

is to strike a delicate balance between controlling inflation and ensuring financial stability, which are essential to fostering sustainable and inclusive growth across the region. The BCEAO also intends to consider long-term solutions to sustainably reduce the impact of economic shocks by contributing to the improvement of agricultural productivity and the reduction of dependence on food imports.

For Bank Al-Maghrib, the analysis of the adequacy of the increase in key rates by African Central Banks reveals significant differences between countries, influenced by vulnerability to commodity prices and exchange rate volatility. In the face of rising inflation, in 2022, Central Banks began to tighten monetary policy. Still, according to the BIS, their reaction was slower compared to other regions, with the median policy rate peaking a year later.

In Morocco, the first increase in the key rate occurred in September 2022, after Bank Al-Maghrib observed that imported inflation was spreading to domestic goods and services. Following three 150-bp rate rises, it decided in June 2023 to pause in view of the downward trend in inflation after peaking at 10 percent in February 2023 and favorable macroeconomic projections. At the same time, Bank Al-Maghrib continued to meet all banks' liquidity needs and support long-term refinancing programs.

In addition, higher policy rates are increasing financing costs, which could undermine financial stability in the medium-to-long term. In addition, higher key rates generally increase financing costs, which could weaken financial stability in the medium and long term. In Morocco, monetary tightening has led to tensions in the bond and stock markets. This led Bank Al-Maghrib to carry out, for the first time in early 2023, a Treasury Bill repurchase operation in conjunction with the budgetary authority to manage these disruptions in an orderly fashion. This action gave banks more liquidity to buy sovereign bonds, enabling them to rapidly stabilize rates on the bond market and give a positive signal to the markets.

After the discussions, it was revealed that inflationary shocks can become structural due to climate change, geopolitical issues, and deglobalization, while weakening growth in some countries. For monetary policy to remain effective, it is crucial to adapt forecasts by incorporating alternative scenarios and realistic transmission mechanisms, while strengthening statistics. Clear communication from Central Banks is key to managing expectations. Fiscal consolidation must remain a priority, with reforms to relieve the state budget. A mix of monetary and fiscal policies is essential to mitigate the effects of shocks, requiring structural reforms to build economic resilience.

4.4 Conclusion of the Chairperson

Closing the session, the Chairperson of the session invited Central Banks to take action in the face of shocks to economies. He also recalled that more than monetary policy is needed to achieve the objectives assigned to the Central Bank, especially in the presence of exogenous shocks. In this regard, he called for the coordination of monetary and fiscal policies. In addition, the CBK's Governor stressed that the actions of the Central Bank must be accompanied by clear and precise communication to ensure better effectiveness of the monetary policy transmission mechanisms.

5. SECOND SESSION

5.1 Introduction

This session was chaired by Mr. Buah Saïdy, Honourable Governor of the Central Bank of The Gambia (CBG). The theme entitled *"Leveraging FinTechs and Artificial Intelligence in the Fight Against Inflation"* was presented by Mr. Leonardo Gambacorta, Manager, Innovation and Digital Economy, Economic and Monetary Department, BIS. The panel consisted of Hon. John Rwangombwa, Governor of the National Bank of Rwanda, and Dr. John Mushayavanhu, Honourable Governor of the Reserve Bank of Zimbabwe.

5.2 Summary of the presentation

During his presentation, Mr. Gambacorta focused on the opportunities and challenges related to the integration of artificial intelligence in the financial field. He also discussed the macroeconomic impact of artificial intelligence and its implications in terms of regulation.

The Presenter recalled that the financial sector is one of the sectors most exposed to artificial intelligence due to the predominance of complex cognitive tasks it involves, such as market analysis, risk management, and strategic decision-making. Moreover, the massive amount of data available in the financial field makes artificial intelligence particularly relevant and valuable for processing and interpreting information efficiently. With artificial intelligence, automating tasks is a reality, resulting in significant gains in efficiency and productivity. In addition, the speed at which calculations and analyses are performed is unprecedented, paving the way for rapid and significant advances. Finally, the ubiquity of artificial intelligence in all sectors of the economy is a testament to its growing importance and profound impact on our society.

In addition, the Presenter pointed out that artificial intelligence presents multiple opportunities in the field of finance. It is used in various fields, such as financial intermediation, insurance, asset management, and payments. It also stands out in risk management, portfolio improvement, and fraud detection. Furthermore, artificial intelligence improves machine learning and credit risk assessment and reduces underwriting fees while encouraging financial inclusion and effective insurance risk analysis. In addition, it helps reduce processing expenses, analyze new data sources, trade at high frequencies, and create new liquidity management tools. Nowadays, it is essential to combat fraud and money laundering.

However, the Presenter recalled that the increasing integration of artificial intelligence in the finance field also creates various challenges and questions to be taken into consideration. Traditional analyses, which are the traditional methods that have been used for a long time, are characterized by their rigidity. They require extensive human supervision needing constant intervention from experts to be carried out. In addition, these analyses are based on a small number of parameters, which may limit their ability to take into account the complexity of the situations studied. When discussing the topic of machine learning, it is important to mention the presence of black box mechanisms, which refer to complex processes whose inner workings are not always transparent to users. Furthermore, the issue of algorithmic discrimination refers to the possibility that biases may creep into the decisions made by algorithms. Moreover, it is essential to consider consumer privacy concerns, as the use of personal data for machine learning purposes can raise ethical questions. Finally, it is also relevant to highlight the phenomenon of data silos, which results in the fragmentation and isolation of datasets, thus limiting their sharing and optimal use. Nowadays, the current economic context is marked by the emergence of new liquidity crises, which can have a significant impact on financial stability. At the same time, an increase in cyber risks is linked to the increasing digitalization of economic and financial activities. Both are major challenges that companies and authorities must face to ensure the sustainability and security of financial systems.

Generative artificial intelligence is facing several important challenges. These include the need to clarify customer-facing applications, the risk of garbage-in-garbage-out (i.e., the quality of the input data directly influences the results produced), the increasing market concentration in customer identification, growing concerns about consumer privacy, and the risk of collusion between different entities. In general, the integration of artificial intelligence in finance offers a wide range of promising opportunities, but it also raises challenges that need to be carefully considered and adequately addressed.

Regarding the macroeconomic impacts of artificial intelligence, the Presenter emphasized its role in transforming various aspects of modern economies. It improves productivity by automating complex and repetitive tasks, saving companies time and costs. Artificial intelligence drives innovation and creates new business opportunities, contributing to economic growth. It also impacts the labor market, replacing some jobs and creating new ones in the development, management, and maintenance of artificial intelligence technologies. This reduces costs by

increasing process efficiency, resulting in lower prices for consumers, and can potentially contain inflation. However, artificial intelligence could also increase economic inequality, leading to changes in global competition and reducing public services such as health, education, and infrastructure.

Finally, the Presenter mentioned the need for an update of financial regulation to integrate artificial intelligence following a balanced approach that considers innovation, while guaranteeing security and fairness. The core principles of artificial intelligence regulation must focus on promoting social and environmental well-being, ensuring transparency and accountability, and protecting privacy. Regulations must prioritize safety and include human oversight to ensure robustness and reliability. Different models of regulation exist: market-based models encourage innovation and self-regulation, while state models align artificial intelligence development with policy objectives. Rights-based approaches emphasize individual and social rights. Thus, international cooperation is essential to harmonize standards and enable knowledge sharing, ensuring effective and uniform governance of artificial intelligence across borders.

5.3 Summary of Panel Discussions

The panel discussions were made by the National Bank of Rwanda (NBR) and the Reserve Bank of Zimbabwe (RBZ).

The two panelists reported on the use of FinTechs and artificial intelligence to control inflation in their respective institutions.

Like African Central Banks, the NBR faces many monetary policy challenges, and technological advances offer promising solutions to overcome them. Traditionally, the transmission of monetary decisions, particularly via interest rates to control inflation, remains limited. Today, new technologies, such as digital financial systems and artificial intelligence, are necessary to improve the transmission of monetary policy.

The emergence of mobile money and digital financial products has significantly transformed the financial landscape. In 2015, financial inclusion in Rwanda was 11 percent. This figure jumped to 77 percent in 2020, reaching 92 percent in the latest survey. This rapid growth is mainly due to the expansion of mobile financial services, which now provide access to services that were previously inaccessible to a large portion of the population. Moreover, 19.2 percent of personal loans are now digital loans, further strengthening access to financial services for citizens.

These innovations have a major impact on how the NBR can influence the country's financial system. By improving financial inclusion, they make it easier to effectively implement monetary policies. In addition, the use of technologies (satellite imagery and artificial intelligence) allows for a better understanding of economic trends, such as agricultural production, and the adjustment of policies accordingly. These technologies also make it possible to improve the productivity of economic sectors at a lower cost.

In addition, Rwanda passed a data protection law three (3) years ago to regulate data collection and processing, particularly in the financial sector. However, the key question remains: how to decide which data is used and which can be published? Clear protocols for the management of sensitive information are essential, and a sound theoretical and regulatory framework is crucial. The National Cybersecurity Agency plays a critical role in data protection, and the principles of "waste in, waste out" must be respected to prevent errors and biases.

Regarding the RBZ, several initiatives have been taken by the institution, such as the creation of data centers and FinTech units. These initiatives aim to centralize data and improve its accuracy, which is crucial for integrating artificial intelligence into monetary policy. In Zimbabwe, artificial intelligence was used to monitor inflation trends in real time, allowing the RBZ to predict inflationary pressures before they materialize. For example, by analyzing real time data on consumer behavior and pricing, the RBZ was able to introduce a new currency and protect it from possible attacks on the market.

For the RBZ, the opportunities that artificial intelligence offers include the analysis of large datasets to make informed forecasts on inflation and other economic indicators, such as Gross Domestic Product (GDP). Artificial intelligence also enables scenario analysis and forecasting of consumer demand, giving the bank better tools to stabilize the economy.

However, one of the challenges to consider is that processing large amounts of data requires a significant and costly investment in IT infrastructure. Additionally, the accuracy of data from platforms like social media can be problematic, as individuals may present different personalities online. Thus, ensuring the integrity and confidentiality of data is essential, as is the protection of sensitive information. Despite these challenges, the benefits of using artificial intelligence in Zimbabwe's monetary policy are evident, with clear examples of how it has already helped guide economic decision-making.

In addition, in Zimbabwe, FinTech companies develop innovative products, prompting regulators to ensure security before they are deployed. In 2021, Zimbabwe introduced a Sandbox system to test new products in controlled environments. Since then, many products have been tested in areas such as Application Programming Interfaces (APIs), blockchain, cybersecurity, and smart contracts. This approach fosters innovation while maintaining a balance between progress and security.

After discussions on the use of artificial intelligence and big data to control inflation, participants highlighted the importance of Central Banks in collecting and analyzing different sources of data to improve their ability to make decisions. However, there were concerns about data integrity and the importance of supplementing traditional models with new data. Cooperative initiatives between Central Banks were proposed to facilitate the sharing of knowledge and resources. The discussions also highlighted major challenges associated with the creation of data systems and the maintenance of skilled staff while supporting the importance of better integration of data sources to improve understanding of the economy and policy formulation.

5.4 Conclusion of the Chairperson

The Chairperson of the session expressed gratitude to the Central Bank Governors and participants for their fruitful discussions on the role of advanced technologies like artificial intelligence in controlling inflation and promoting economic stability in Africa. He stressed the need for a coordinated approach to implement these innovations responsibly, focusing on financial stability, consumer interests, and sustainable growth. The Symposium provided a solid foundation for policies and initiatives to combat inflation and support resilient economies.

6. THIRD SESSION

6.1 Introduction

Chaired by Mr. Emmanuel Mpawe Tutuba, Honourable Governor of the Bank of Tanzania, this session focused on the theme entitled "*Risks and Opportunities for Using Big Data Analytics and Artificial Intelligence in Forecasting Inflation and Monetary Policy Decisions*". The presentation was made by Mr. Bruno Tissot, Head of the Statistics and Research Support Service and Head of the Secretariat of the Irving Fisher Committee, BIS, and Prof. Sabyasachi Kar, Reserve Bank of India, Chair Professor, Institute of Economic Growth, India. The panel was composed of Dr. Olayemi Cardoso, Honourable Governor of the Central Bank of Nigeria (CBN); Mr. Mahamat Djibrine Souleyman, Director General of Studies, Finance, and International Relations, Banque des États de l'Afrique Centrale (BEAC); and Mr. Cornelius Karlens Dekop, Honourable Governor of the Bank of Botswana.

6.2 Summary of Presentations

The first presentation made by Mr. Tissot underlined that the digital revolution has introduced new tools and types of data that have had a significant impact on the Central Bank. Big data, artificial intelligence, and Machine Learning (ML) have profoundly changed the way data is collected, processed, and analyzed. This technology provides opportunities to analyze large

databases, such as geographic data and real time mobile trends, providing new insights into economic activity. In addition, it allows for innovative use of existing open data sources, such as textual and organizational data, to improve decision-making.

For the Presenter, big data has proven to be a valuable resource to support the production of inflation statistics and to obtain information from other sources. Traditional statistical methods often require specialized surveys, which can be expensive and time-consuming. Large data sources, such as supermarket data scanners and web scraping allow for more accurate and detailed information collection, reducing reporting costs, increasing responsiveness to economic changes, and offering more accurate inflation estimates.

In addition, the Presenter noted that big data has improved inflation forecasting capability by providing real time indicators and advanced estimates. Central Banks can now use a variety of data sources to improve short- and long-term inflation forecasts, including online sales, Google Trends, and financial indicators, such as commodity prices. ML algorithms can process this new data and identify nonlinear patterns or starting points that traditional models might overlook.

Thus, data has played a crucial role in the development of monetary policy. With a deeper understanding of inflationary pressures and other economic indicators, Central Banks are better prepared to make informed decisions. Artificial intelligence and big data allow policymakers to assess the transmission of monetary policies through accurate data sets, providing a clearer view of the economy. However, the use of big data and artificial intelligence poses several policy challenges. First, the accuracy of big data can be compromised by incomplete data sets, making it essential for Central Banks to ensure that the data they use is representative and reliable. Second, the nature of many artificial intelligence algorithms makes it difficult to explain how policy choices are made based on artificial intelligence, potentially undermining transparency and credibility.

To conclude his remarks, the Presenter concluded that Central Banks have unprecedented opportunities to improve inflation forecasting and monetary policy formulation. However, a successful integration of these technologies requires careful attention to the associated challenges, such as data management, quality assurance, and transparency. By taking a fair approach, Central Banks can take advantage of big data and artificial intelligence while ensuring financial stability, credibility, and the achievement of monetary policy objectives.

Prof. Kar made the second presentation. He presented the dangers and opportunities of using big data analytics and artificial intelligence to predict inflation and make monetary policy decisions. He gave the example of the Billion Prices Project of Massachusetts Institute of Technology (MIT), which illustrated the use of big data in macroeconomic forecasting by collecting about 5 million online prices daily from 300 retailers in 70 countries. With this real time information, it is possible to create daily price indexes, which allows for a more accurate reflection of price fluctuations compared to conventional methods.

He said that big data has benefits, such as its rapid and continuous production, offering varied and accurate information with a wider geographical coverage. It provides early forecasts compared to conventional data, identifies patterns and trends in economic behavior, and implements new data on a regular basis, allowing policymakers to take a more dynamic view of inflation and economic growth.

However, the Presenter stressed the importance of understanding the constraints of big data. This is because even though it offers high-frequency data that can solve problems such as measurement biases and fragmented datasets, it also faces challenges, such as sampling biases caused by the "digital divide", inconsistencies caused by evolving algorithms, and the lack of long historical time series. Thus, big data should be a complementarity, and not a substitute, for traditional data sources.

Meta-analyses and machine learning methods tend to be effective over longer forecast periods, especially in advanced economies and long-term growth forecasting. However, they are not always superior to non-machine learning based methods, especially when it comes to

forecasting inflation. For example, methods that do not rely on machine learning, such as dynamic factor models, can be competitive and, in some cases, perform better than machine learning-centric methods. Forecasters are advised to use a combination of the ML and non-ML techniques for macroeconomic forecasting until further research identifies the best method.

The Presenter also indicated that the relatively recent emergence of big data also poses challenges, including its limited time frame, which makes robust parameter estimation and historical comparisons difficult. The infrastructure needed to manage big data is expensive, requiring significant investments in storage, processing power, and specialized tools for data management and analysis. In addition, big data is often unstructured, incomplete, or inaccurate, making it difficult to use it for reliable forecasting. In this regard, the Presenter highlighted three (3) main ML techniques applied to macroeconomic forecasting: penalization-based techniques, random decision tree techniques, and artificial neural networks.

Finally, the Presenter concluded that big data and artificial intelligence offer valuable tools for economic forecasting. Still, they come with significant risks and challenges. While these innovative approaches offer opportunities to improve forecasting, they should be used in conjunction with traditional methods until their full potential is proven.

6.3 Summary of Panel Discussions

The panel discussions were led by three (3) Central Banks (Nigeria, BEAC, and Botswana).

In Nigeria, the Central Bank (CBN) places great importance on the use of big data and artificial intelligence to improve the management of complex systems and strengthen decision-making. One of the major innovations is the adoption of artificial intelligence to analyze public perceptions of political decisions from news articles and social media, a system inspired by the Bank Negara Malaysia. This approach provides a better understanding of public opinion and has improved the accuracy of the CBN's economic forecasts, including the integration of real time data. The collaboration with the Bank Indonesia has also leveraged social networks, such as Twitter and Facebook to refine perception analyses and predictive models.

The CBN also develops intelligent bots as part of its Dynamic Integrated Analytical Model for Economic Development Unit (DIAMoND), which uses technologies, such as natural language processing (NLP), deep learning, and machine learning. This tool, with an interactive dashboard, focuses on key economic indicators, such as inflation and real GDP, providing decision-makers with real time macroeconomic trends and improving the accuracy of inflation forecasts.

To foster data sharing across government sectors, the CBN has set up an Integrated Data Sharing Portal (IDSP), centralizing macroeconomic statistics and improving data consistency. At the same time, an enterprise data warehouse has been created to analyze large amounts of financial data. The CBN also uses mobile surveys to collect real time data from households and settlements, ensuring reliable data for economic policymaking. These innovations have already strengthened the quality of the country's economic analyses and decisions.

Big data and artificial intelligence offer enormous potential for Central Banks to achieve price stability and sound monetary policy. These technologies enable improved forecasting, better decision-making, and economic resilience. However, it is crucial to remember that artificial intelligence should complement, not replace, human judgment. By balancing technology and human expertise, Central Banks can effectively navigate the complex economic landscape and fulfill their responsibilities.

Regarding the BEAC, although it does not have experience in big data and artificial intelligence, the bank is aware of the benefits of using these tools. The BEAC is currently in the reflection phase to begin its process of integrating artificial intelligence. The fundamental question is how best to move forward. It is crucial to carefully consider the direction for effective and efficient progress, leveraging the experiences of other AACB member Central Banks.

However, following the sharing of experiences by other structures, one of the major challenges they face is to set up effective information collection processes in order to have reliable and

relevant data for informed and strategic decision-making. In the area of payment systems, the BEAC has recently undertaken to gather detailed information with the aim of deepening its understanding of the market. This approach has led the BEAC to look at the situation in Africa, a region where these systems have already gained solid experience and widespread adoption. The BEAC is in the process of taking steps to obtain financial data by contacting banking institutions directly. However, this procedure turns out to be complex and requires a lot of time and effort.

For the Bank of Botswana, its initiatives have focused on integrating artificial intelligence technologies, including those developed by Microsoft, into many aspects of its operations, as a Central Bank. Research is currently conducted to determine the quickness of integrating these technologies into important areas, such as policy formation and forecasting.

Since 2020, the Bank of Botswana has been using artificial intelligence, particularly Machine Learning, to carry out macroeconomic analysis and forecasting to better interpret and model economic trends, which are traditionally managed using rigid data models. With the help of artificial intelligence, the Bank of Botswana is now able to examine larger datasets more efficiently.

One of the most significant issues that the Bank of Botswana has sought to address is the delay in data collection. For example, lagged economic data obtained from statistical agencies includes GDP quarterly reports, which made it difficult to make decisions. Artificial intelligence and ML have made it possible to fill these gaps with more accurate and real time updated data by allowing to make more reliable GDP estimates. This has led to a significant increase in the effectiveness of the Bank of Botswana and enabled them to provide more effective advice to the Monetary Policy Committee (MPC), which has ultimately contributed to the maintenance of financial stability.

However, the Bank of Botswana faces challenges and issues, such as the complexity of integrating new artificial intelligence solutions, risks associated with cybersecurity, and risks related to sources of supply. Compliance and the protection of personal information are also very important issues. Concerns about sustainability raised by the high energy consumption of artificial intelligence models are also being highlighted.

During the discussions, the need to ensure the quality of the data used and to consider potential biases was underscored. In addition, participants warned of the dangers in terms of cyber security and the harmful consequences of over-reliance on technology. The discussions also highlighted the crucial importance of starting the artificial intelligence development process while stressing the need to maintain human supervision throughout the process. The opportunities offered by artificial intelligence are many and varied. However, it is essential to emphasize that the ethical considerations associated with the use of this technology remain of paramount matter.

6.4 Conclusion of the Chairperson

The Chair of the session concluded that technology offers significant opportunities to improve economic policy decision-making, particularly with regard to controlling inflation. By analyzing huge data sets in real time, these technologies can capture economic trends and prospects that traditional methods might overlook. As Central Banks move towards inflation targeting, these technologies are becoming a pillar to improve inflation expectations. However, challenges, such as algorithmic bias, concerns about data privacy, and misguided forecasts underscore the need for strong governance, strong regulatory frameworks, and a strong ethical foundation. To maximize the benefits of these technologies, a balanced approach is needed, requiring more research, collaboration, knowledge sharing, and best practices. The ideas from this discussion will shape the future of monetary policy in various regions, promoting economic stability and the nations' prosperity.

7. FOURTH SESSION

7.1 Introduction

This session was chaired by Dr. Phil Mnisi, Honourable Governor of the Central Bank of Eswatini. It was structured around a presentation by Ms. Catherine D'Yvoire, Chief Executive Officer, CDY Advisory.

7.2 Summary of the Presentation

At the beginning of her presentation, Mrs. D'Yvoire stressed the control of the general level of prices as one of the main missions of Central Banks and the importance of inflation management tools for them. She mentioned the limits related to the use of traditional interest rates, especially with the outbreak of the COVID-19 pandemic, and the possibilities offered by big data and artificial intelligence. Thus, it highlighted the current consensus around the issue, the challenges and risks associated with the use of artificial intelligence, and the prospects for the future.

The Presenter indicated that nowadays, the consensus is that big data analysis, interest rates, and artificial intelligence are powerful tools for Central Banks in the fight against inflation. However, there are limits to the use of interest rate hikes, including due to constraints, such as financial stability, the response of the banking sector, and the relationship with international interest rates. In order to understand these aspects, Central Banks are pioneers in data analysis and the use of artificial intelligence, helping them to make decisions based on concrete data and to predict inflation. Indeed, big data offers them a wealth of information on numerous economic aspects, and artificial intelligence enables them to find meaningful patterns in these massive quantities of data. Central Banks are already using these tools for a variety of operations, including fighting inflation. However, it is still uncertain whether artificial intelligence can predict unforeseen events. Some African Central Banks may have other priorities, but the trend to adopt these technologies is growing.

In addition, she indicated that the use of big data presents challenges for Central Banks, such as data quality, availability of Data Scientists, privacy of data models, dependence on third parties, the issue of the sovereignty of clouds managed by offshore operators, and the disparities of national and regional IT ecosystems. The collection, quality, frequency, and availability of big data can pose challenges, as can the shortage of data scientists to analyze the data. Investments in these technologies are necessary, but budget constraints can be a barrier. Issues of privacy, sovereignty, and cybersecurity are also critical. Also, Central Banks must decide on the use of internal or external data, the artificial intelligence models to be used, data storage, staff training, and data governance. Choosing reliable third parties and robust artificial intelligence models is crucial to minimize the risks of using big data and artificial intelligence in monetary policy decision-making.

In addition, according to Mrs. D'YVOIRE, as big data and artificial intelligence are now essential for African Central Banks, regional cooperation between these institutions could be a solution to overcome the challenges related to the mastery of these technologies. By sharing knowledge, tools, and data and pooling investments in new technologies, Central Banks could improve their ability to collect, store, and analyze big data.

This regional cooperation could be modelled on the ASEAN+3 Chiang Mai Initiative, extended to the Chiang Mai Multilateralization Initiative. In addition, national collaboration is also needed to combat inflation by identifying the underlying sources of supply and demand imbalances. To achieve this, it is crucial to collect more data to analyze commodity supply chains, seasonal trends, and regional disparities to anticipate temporary shortages and design appropriate policy responses. Thus, cooperation between African Central Banks, both at the regional and national levels, is essential to take full advantage of big data and artificial intelligence, improve monetary policy, and effectively fight inflation in Africa while preserving the confidentiality of sensitive data.

To conclude her presentation, Mrs. D'Yvoire stressed that big data and artificial intelligence are already an integral part of the global economy, and it is key that Central Banks take ownership

of them to be agents of change. Prioritizing sovereignty and cooperation is crucial to preserving the single monetary policy decision-making process and achieving "economies of scale" there. Some of the Central Banks could have the possibility of doing a "frog operation" and joining the group at a stage abroad once decisions and choices have been made.

7.3 Conclusion of the Chairperson

In conclusion, the Chairperson of the session thanked the Presenter for her detailed presentation and the audience for their participation. He recalled that Central Banks cannot afford to remain in the background in the face of current technological advances. They must engage proactively and enlightenedly in this race, fully exploiting the potential of big data and artificial intelligence while controlling the associated risks. He encouraged the Central Banks that are members of the AACB to capitalize on the shared experiences and strive to innovate relentlessly.

8. RESOLUTIONS OF THE SYMPOSIUM

1. Monetary policy alone is not enough to achieve the objectives assigned to the Central Bank, especially in the presence of exogenous shocks. In this regard, it is important to ensure coordination of monetary and fiscal policies.
2. Central Banks' decisions must be accompanied by clear and precise communication to ensure better effectiveness of monetary policy transmission mechanisms.
3. A coordinated approach is needed to implement the innovations offered by big data and artificial intelligence responsibly, focusing on financial stability, consumer interests, and sustainable growth.
4. A balanced approach is needed, requiring more research, collaboration, knowledge sharing, and best practices to maximize the benefits of these technologies;
5. However, it is important to pay attention to challenges such as algorithmic bias, concerns about data privacy, misleading forecasts and the need for strong governance, regulatory frameworks, and ethical foundations;
6. Central Banks must proactively and informedly engage with current technological advances, including by fully exploiting the potential of big data and artificial intelligence while controlling the associated risks;
7. AACB member Central Banks must capitalize on shared experiences and strive to innovate relentlessly in a cooperative framework.



LIST OF PARTICIPANTS

| # | Name | Position | Institution | Email |
|-----|-----------------------------------|--|--------------------------------------|-------------------------------|
| 1. | Mrs Ejigayhu Tefera | Economist | African Peer Review Mechanism (APRM) | Emuyenat@gmail.com |
| 2. | Mrs Marie-Antoinette Rose Quatre | Chief Executive Officer | African Peer Review Mechanism (APRM) | Dahlia.Ngoulakia@aprm-au.org |
| 3. | Mr Hugues Manzila | Country Review Coordinator | African Peer Review Mechanism (APRM) | Hugues.Manzila@aprm-au.org |
| 4. | Miss Rumbidzai Treddah Manhando | Programme Coordinator – AUFIs | African Union Commission (AUC) | ManhandoR@africa-union.org |
| 5. | Mr Djamel Ghrib | Director, Economic Development, Integration and Trade | African Union Commission (AUC) | DjamelG@africa-union.org |
| 6. | Mrs Mandy Mauyakufa | Programme Officer | African Union Commission (AUC) | Mauyakufam@africa-union.org |
| 7. | Dr. Americo D' Oliveira Dos Ramos | Gouverneur | Banco Central de São Tomé e Príncipe | aramos@bcstp |
| 8. | Dr. Osiris Fernandes | Senior Economist at the Department of Economic Studies | Banco Central de São Tomé e Príncipe | osirisfjcosta@hotmail.com |
| 9. | Mr Jamal Luís Abacar Omar | Executive Director And Board Member | Banco de Moçambique | candida.tivane@bancomoc.mz |
| 10. | Mr Pedro José Munguambe | Assistant Director | Banco de Moçambique | pedro.munguambe@bancomoc.mz |
| 11. | Mr Stenio Antonio | Office | Banco Nacional de Angola | svantonio@bna.ao |
| 12. | Mrs Yola José Miguel | Deputy Director | Banco Nacional de Angola | yvandunem@bna.ao |
| 13. | Mrs Marilia De Fatima Pocas | Board Member | Banco Nacional de Angola | mpocas@bna.ao |
| 14. | Mr Abderrahim Bouazza | Deputy Governor | Bank Al-Maghrib | g.faddi@bkam.ma |
| 15. | Mr Cornelius Karlens Dekop | Governor | Bank of Botswana | Jaudis@bob.bw |
| 16. | Mr Tayani Chankuluba | Special Assistant to the Governor | Bank of Botswana | Chankulubat@bob.bw |
| 17. | Mr Innocent Molalapata | Director, Research and Financial Stability | Bank of Botswana | MolalapataI@bob.bw |
| 18. | Dr. Kaelo Ntwaepelo | Principal Economist, Research and Financial Stability | Bank of Botswana | NtwaepeloK@bob.bw |
| 19. | Dr. Ernest Addison | Governor | Bank of Ghana | conf.plus@bog.gov.gh |
| 20. | Mr Clarence Blay | Head, Payment Systems Department | Bank of Ghana | clarence.blay@bog.gov.gh |
| 21. | Mr Stephen Nortey | Chief Manager | Bank of Ghana | stephen.nortey@bog.gov.gh |
| 22. | Dr. Ashwin Moheeput | Assistant Director | Bank of Mauritius | Ashwin.moheeput@bom.mu |
| 23. | Miss Leonie Dunn | Deputy Governor | Bank of Namibia | angelina.schroeder@bon.com.na |
| 24. | Mrs Saara Meameno Kashaka | Principal Economist | Bank of Namibia | saara.mukumangeni@gmail.com |
| 25. | Mr John Rhodes Mero | Assistant Manager | Bank of Tanzania | jrmero@bot.go.tz |
| 26. | Miss Betrida Wilfred | Economist | Bank of Tanzania | bkwilfred@bot.go.tz |
| 27. | Mr Emmanuel Mpawe Tutuba | Governor | Bank of Tanzania | mlmwizarubi@bot.go.tz |
| 28. | Dr. Michael Atingi-Ego | Deputy Governor | Bank of Uganda | matingi-ego@bou.or.ug |

| # | Name | Position | Institution | Email |
|-----|---|--|---|--|
| 29. | Dr. Adam Mugume | Executive Director | Bank of Uganda | amugume@bou.or.ug |
| 30. | Mrs Liz Mukasa Samula | Economist | Bank of Uganda | lsamula@bou.or.ug |
| 31. | Mr Edward Tenywa | Deputy Director, Governors' Office | Bank of Uganda | etenywa@bou.or.ug |
| 32. | Dr. Jonathan Mpundu Chipili | Director - Research | Bank of Zambia | jchipili@boz.zm |
| 33. | Mr Chungu Kapembwa | Acting Assistant Director, Macroeconomic Analysis | Bank of Zambia | ckapembwa@boz.zm |
| 34. | Dr. Denny Kalyalya | Governor | Bank of Zambia | dkalyalya@boz.zm |
| 35. | Mr Martin Mwiinga | Assistant Director & E.A. to Governor | Bank of Zambia | mmwiinga@boz.zm |
| 36. | Mr Goodson Kataya | Acting Director Financial Stability | Bank of Zambia | gkataya@boz.zm |
| 37. | Mrs Lyness Phiri Mambo | Acting Director - Prudential Supervision | Bank of Zambia | lmambo@boz.zm |
| 38. | Mrs Miriam Tembo Kamuhuza | Director - Payment Systems | Bank of Zambia | mkamuhuza@boz.zm |
| 39. | Mrs Harizafy Noelimanana Ralarosy Andriantsoa | Directeur des Études et des Relations Internationales | Banky Foiben'i Madagasikara | h.Ralarosy@bfm.mg |
| 40. | Mr Aubin Aurore Belalahy | Second Deputy Governor | Banky Foiben'i Madagasikara | A.BELALAHY@bfm.mg |
| 41. | Mr Mohamed Robert Carton | Directeur des Études | Banque Centrale de Djibouti | mohamed.robert@banque- centrale.dj |
| 42. | Mr Bouna Kerkoub | Directeur Général | Banque Centrale de Mauritanie | kerkoub@bcm.mr |
| 43. | Mr Mohamed Abdallahi Beibakar | Directeur Général de l'Administration | Banque Centrale de Mauritanie | Diawara@bcm.mr |
| 44. | Mr Diawara Mamoudou | Directeur Général de la Supervision Bancaire et de la Stabilité Financière | Banque Centrale de Mauritanie | Diawara@bcm.mr |
| 45. | Mr Mohamed Mehrez Cheikhrouhou | Director of monetary policy implementation | Banque Centrale de Tunisie | mohamedmehrez.cheikhrouhou@ bct.gov.tn |
| 46. | Dr. Imani Younoussa | Governor | Banque Centrale des Comores | nayla.mabrouk@banque- comores.km |
| 47. | Dr. Hamidou Issoufa Mohamed Cheik | Directeur des Études et de la Stabilité Monétaire | Banque Centrale des Comores | hamidou.mohamedcheik@banque- comores.km |
| 48. | Mr Norbert Assogba | Assistant du Gouverneur | Banque Centrale des États de l'Afrique de l'Ouest (BCEAO) | nassogba@bceao.int |
| 49. | Mr Blehoue Tousaint Damoh | Directeur de la Conjoncture Économique et des Analyses Monétaires | Banque Centrale des États de l'Afrique de l'Ouest (BCEAO) | tdamoh@bceao.int |
| 50. | Mr Jean Claude Kassi Brou | Gouverneur | Banque Centrale des États de l'Afrique de l'Ouest (BCEAO) | caudibert@bceao.int |
| 51. | Mr Damas Djamba Tambwe Eluhu | Directeur Des Analyses Économiques | Banque Centrale du Congo | d.djamba@bcc.cd |
| 52. | Mr Olivier Tallys Talebuyi Tayeye | Manager | Banque Centrale du Congo | talebuyi@gmail.com |
| 53. | Mr Edouard Normand Bigendako | Gouverneur | Banque de la République du Burundi | ednbigendako@brb.bi |
| 54. | Mr Georges Ntangorane | Director | Banque de la République du Burundi | gntangorane@brb.bi |
| 55. | Dr. Nafé Daba | Chef de Service Relations Financières Internationales | Banque des États de l'Afrique Centrale (BEAC) | nafe@beac.int |
| 56. | Mr Simplicie Duclair | Adjoint au Directeur des | Banque des États de | lonkeng@beac.int |

| # | Name | Position | Institution | Email |
|-----|-------------------------------------|---|---|----------------------------------|
| | Lonkeng | Relations Internationales | l'Afrique Centrale (BEAC) | |
| 57. | Mr Mahamat Djibrine Souleyman | Directeur Général des Études, Finances et Relations Internationales | Banque des États de l'Afrique Centrale (BEAC) | djibrine@beac.int |
| 58. | Mr Jean-Clary Otoumou | Directeur Général de l'Exploitation | Banque des États de l'Afrique Centrale (BEAC) | otoumou@beac.int |
| 59. | Mr Innocent Molalapata | Director | Central Bank of Botswana | molalapatai@bob.bw |
| 60. | Dr. Ahmed Mohamed Ahmed Ali Sahloul | Assistant Sub Governor | Central Bank of Egypt | Ahmed.sahloul@cbe.org.eg |
| 61. | Mr Hassan Abdalla | Governor | Central Bank of Egypt | Hassan.abdalla@cbe.org.eg |
| 62. | Dr. Naglaa Nozahie | Governor's Advisor for African Affaires | Central Bank of Egypt | naglaa.nozahie@cbe.org.eg |
| 63. | Mr Osama Abdelrahman | Deputy General Manager | Central Bank of Egypt | osama.abdelwahed@cbe.org.eg |
| 64. | Mrs Rana El Nogoumie | Inspector at Basel Sector | Central Bank of Egypt | rana.elnogoumie@cbe.org.eg |
| 65. | Mr Sikhumbuzo Sabelo David Dlamini | Director Research | Central Bank of Eswatini | sikhumbuzod@centralbank.org.sz |
| 66. | Mr Vusi Vvo Mabilisa | Principal Economist | Central Bank of Eswatini | Vusim@centralbank.org.sz |
| 67. | Dr. Philemon Fana Mnisi | Governor | Central Bank of Eswatini | princessk@centralbank.org.sz |
| 68. | Dr. Kamau Thugge | Governor | Central Bank of Kenya | Governor@centralbank.go.ke |
| 69. | Prof. Robert Mudida | Director, Research Department | Central Bank of Kenya | mudidar@centralbank.go.ke |
| 70. | Mr Adam Boru | Senior Manager, Bank Supervision Department | Central Bank of Kenya | boruam@centralbank.go.ke |
| 71. | Mr Luke Plapan | Manager, Digital Payments | Central Bank of Kenya | PlapanLA@centralbank.go.ke |
| 72. | Miss Wairimu Joanne Waitara | Economist | Central Bank of Kenya | waitarajw@centralbank.go.ke |
| 73. | Dr. Sheila Mwendwa Kaminchia | Economist | Central Bank of Kenya | kaminchias.m@centralbank.go.ke |
| 74. | Dr. Isaya Maana | Ag. Deputy Director, Research Department | Central Bank of Kenya | maanai@centralbank.go.ke |
| 75. | Dr. Emmanuel Letete | Govenror | Central Bank of Lesotho | mletete@centralbank.org.ls |
| 76. | Dr. Musa Dukuly | Deputy Governor | Central Bank of Liberia | mbogun@cbl.org.lr |
| 77. | Mr Jefferson Kambo | Director of Research, Policy & Planning | Central Bank of Liberia | jkambo@cbl.org.lr |
| 78. | Mr Michael Ogun | Senior Advisor | Central Bank of Liberia | mbogun@cbl.org.lr |
| 79. | Mr Muhammad Sani Abdullahi | Deputy Governor | Central Bank of Nigeria | msabdullahi7@cbn.gov.ng |
| 80. | Dr. Ladi Bala-Keffi | Ag. Director, Monetary Policy Department | Central Bank of Nigeria | akbello@cbn.gov.ng |
| 81. | Mr Olayemi Cardoso | Governor | Central Bank of Nigeria | zlawal@cbn.gov.ng |
| 82. | Mr Nazeer Samaila Muhammad | Assistant Economist | Central Bank of Nigeria | nsmuhammad@cbn.gov.ng |
| 83. | Dr. Chikelu Obalum | Head, Cross Border Banking Supervision Group | Central Bank of Nigeria | ceobalum@cbn.gov.ng |
| 84. | Dr. Tuwe Garbobiya | Principal Economist 1 | Central Bank of Nigeria | tsgarbobiya@cbn.gov.ng |
| 85. | Mr Abdi Abdullahi | Governor | Central Bank of Somalia | mahad.Mohamed@centralbank.gov.so |
| 86. | Mr Mahad Mohamed | Advisor | Central Bank of Somalia | mahad.mohamed@centralbank.gov.so |
| 87. | Mr Salaheldin Sheikh Khidir Bakhit | Deputy Governor | Central Bank of Sudan | mohamed.ahmed@cbos.gov.sd |
| 88. | Dr. Samia Mohammed Elhadi Elamin | Senior economist | Central Bank of Sudan | Samia.alhadi@gmail.com |
| 89. | Mr Buah Saidy | Governor | Central Bank of The Gambia | bsaidy@cbg.gm |

| # | Name | Position | Institution | Email |
|------|--------------------------------------|--|---|----------------------------------|
| 90. | Mr Karamo Jawara | Director, Banking and Payment Systems Department | Central Bank of The Gambia | kjawara@cbg.gm |
| 91. | Mr Sheriff Touray | Deputy Director | Central Bank of The Gambia | shtouray@cbg.gm |
| 92. | Mr Attikan Dibba | CFO | Central Bank of The Gambia | adibba@cbg.gm |
| 93. | Mr Ndoye Abdoulaye | Auditeur | Grant Thornton | abdoulaye.ndoye@sn.gt.com |
| 94. | Dr. Louis Austin Kasekende | Executive Director | Macroeconomic and Financial Management Institute of Eastern and Southern Africa (MEFMI) | louis.kasekende@mefmi.org |
| 95. | Prof. Ndahiriwe Kasai | Director | National Bank of Rwanda | kndahiriwe@bnr.rw |
| 96. | Hon. John Rwangombwa | Governor | National Bank of Rwanda | dkabarisa@bnr.rw |
| 97. | Dr. Wilson T. Banda | Governor | Reserve Bank of Malawi | wtbanda@rbm.mw;msoko@rbm.mw |
| 98. | Dr. Mark Lungu | Director, Public Relations | Reserve Bank of Malawi | mlungu@rbm.mw |
| 99. | Dr. Nebson Mupunga | Director | Reserve Bank of Zimbabwe | nmupunga@rbz.co.zw |
| 100. | Dr. John Mushayavanhu | Governor | Reserve Bank of Zimbabwe | ngorova@rbz.co.zw |
| 101. | Mr Tawedzerwa Ngundu | Chief Economist | Reserve Bank of Zimbabwe | tngundu@rbz.co.zw |
| 102. | Dr. Moris B. Mpofu | Executive/Assistant of the Gov. | Reserve Bank of Zimbabwe | BMpofu@rbz.co.zw |
| 103. | Mrs Christelle Viljoen | Senior Analyst | South African Reserve Bank | christelle.viljoen@resbank.co.za |
| 104. | Mrs Fundi Tshazibana | Deputy Governor | South African Reserve Bank | Blessing.Sokhulu@resbank.co.za |
| 105. | Mrs Ayanda Mokgolo | Senior Manager and Head of CCBG Secretariat | South African Reserve Bank | ayanda.mokgolo@resbank.co.za |
| 106. | Mr Piet Madimetja (Tim) Masela | Head: National Payment System Department | South African Reserve Bank | tim.masela@resbank.co.za |
| 107. | Miss Nkareng Thite | Divisional Head: Financial Conglomerates Supervision | South African Reserve Bank | Nkareng.Thite@resbank.co.za |
| 108. | Mr Abdourahimoune Amadou Abdoul Aziz | Chargé d'Études | AACB Secretariat | aamadouabdoulaziz@bceao.int |
| 109. | Mrs Dieng Imily | Assistante de Direction | AACB Secretariat | idieng@bceao.int |
| 110. | Mr Konan Yao Arthur Koffi | AACB Website Manager | AACB Secretariat | kyakoffi@bceao.int |
| 111. | Mr Thierno Mountaga Mbow | Gestionnaire comptable et budgétaire | AACB Secretariat | tmbow@bceao.int |
| 112. | Mr Seye Mamadou | Archivist | AACB Secretariat | maseye@bceao.int |
| 113. | Dr. Djoulassi Kokou Oloufadi | AACB Executive Secretary | AACB Secretariat | dkoloufadi@bceao.int |
| 114. | Mr H. Seegolam | Governor | Bank of Mauritius | |
| 115. | Mr M. K. Yerukunondu | First Deputy Governor | Bank of Mauritius | |
| 116. | Ms H. Sewraj-Gopal | Second Deputy Governor | Bank of Mauritius | |
| 117. | Mr S. Gopaul | Acting Secretary | Bank of Mauritius | |
| 118. | Mr R. Chinniah | Director – Supervision | Bank of Mauritius | |
| 119. | Ms S. Hurrymun | Director – Supervision | Bank of Mauritius | |
| 120. | Ms M. Heerah-Pampusa | Director – Economic Analysis & Research and Statistics | Bank of Mauritius | |
| 121. | Mr A. Bacha | Director – Digital Innovation and Payment Systems | Bank of Mauritius | |

| # | Name | Position | Institution | Email |
|------|------------------------|--|-------------------------------------|-----------------------------|
| 122. | Mr W. Khodabocus | Acting Director – Financial Stability and Enterprise Risk | Bank of Mauritius | |
| 123. | Ms P. Charazac | Advisor - IIR | Bank of Mauritius | |
| 124. | Ms R. Matabudul | Advisor - Strategy | Bank of Mauritius | |
| 125. | Ms U. Soobarah | Assistant Director – Supervision | Bank of Mauritius | |
| 126. | Ms T. G. Jhurry | Assistant Director – Payments System & Digital Currency and Digital Innovation & FinTech | Bank of Mauritius | |
| 127. | Mr S. Ramnarainsing | Assistant Director – Financial Markets Operations | Bank of Mauritius | |
| 128. | Mr J. Li Yun Fong | Assistant Director – IT | Bank of Mauritius | |
| 129. | Mr Y. Chu Fung Leung | Assistant Director – Banking & Currency Division | Bank of Mauritius | |
| 130. | Dr A. Moheeput | Assistant Director – Economic Analysis & Research and Statistics | Bank of Mauritius | |
| 131. | Mr A. Ghanty | Assistant Director – Information Security, Enterprise Risk Division | Bank of Mauritius | |
| 132. | Mr N. Kowlessur | Head - Climate Change Centre | Bank of Mauritius | |
| 133. | Ms R. Jutton Gopy | Head – Legal Services | Bank of Mauritius | |
| 134. | Mr D. Rughoobur | Head- Governor`s Office | Bank of Mauritius | |
| 135. | Mr F. Caunhye | Chief – Communications | Bank of Mauritius | |
| 136. | Prof. Natacha VALLA | Doyenne de l'École de Management et d'Innovation | Sciences Po | natacha.valla@sciencespo.fr |
| 137. | M. Leonardo GAMBACORTA | Responsable, Innovation et Économie Numérique du Département Économique et Monétaire | Bank for International Settlements | Leonardo.Gambacorta@bis.org |
| 138. | Prof. Andreas DOMBRET | Chercheur Principal Adjoint | Université de Columbia | |
| 139. | Mr Bruno Tissot | Head of Statistics and Research Support and Head of the Secretariat of the Irving Fisher Committee | Bank for International Settlements | Bruno.Tissot@bis.org |
| 140. | Prof. Sabyasachi Kar | RBI Chair Professor | Institute of Economic Growth, India | skar@iegindia.org |
| 141. | Ms Catherine D'Yvoire | Managing Director | CDY Advisory | Catherine.dyvoire@gmail.com |