

## **Conducting Policy and Operational Research in the Central Bank of Nigeria: Efforts, Challenges and Areas for Collaboration**

By

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### **12.0 Introduction**

The success or failure of policy is significantly associated with the quality of research and data relied upon in its formulation and implementation. A well-researched issue should deliver optimal outcomes, all things being equal. Thus, the role of research in policy design cannot be overemphasized. Although policy and operations research are often used somewhat interchangeably, they are different and have specialized applications. Policy research is the process of conducting research on, or examining the impact of public policies, often involving cost-benefit analysis, in order to provide information to policymakers and stakeholders towards enhancing the public good.

Operations research, on the other hand, is concerned with the use of scientific, particularly mathematical analysis, to provide a quantitative basis for decision-making. It creates implementable solutions to complex problems by converting data into usable information, which improves outcomes and helps in projecting the future path of business operations. There are three main features of operations research, namely: systems orientation, the use of interdisciplinary teams, and the application of a science-based algorithm for evaluation<sup>24</sup>.

At the Central Bank of Nigeria (CBN), both policy and operations research have been used to analyse alternative scenarios towards informed decision-making; for forecasting purposes; in the coherent and logical organisation of economic ideas and data; and to simplify and clarify economic problems by focusing on factors that best explain the structure of the economy and how it works. These processes have been organized in standard frameworks for easy and timely application.

This paper, therefore, presents a snapshot of policy and operations research at the CBN with a view to suggesting areas of possible collaboration. In sections 2 and 3, an overview of the research efforts at the CBN and the challenges faced in carrying out policy and operational research are respectively presented. Section 4 outlines measures pursued to surmount the highlighted challenges, while section 5 discusses some emerging issues for policy and operational research. Finally, in section 6, prospects for inter-agency collaboration are enunciated, whereas the last section concludes the paper.

### **12.1 Overview of Research Efforts at the Central Bank of Nigeria**

Research at the CBN has contributed immensely to the achievement of the Bank's mandate over the years. The main goal of policy and operational research at the Bank is to provide a strong conceptual and empirical basis for conducting monetary policy.

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<sup>24</sup> See, <https://www.britannica.com/topic/operations-research/Essential-characteristics>.

In pursuing this objective, the Research Department has continued to conduct policy-oriented research on topical economic issues to broaden our understanding of the functioning of the Nigerian economy and produce consistent macroeconometric models, tools, and analyses that are relevant for the attainment of the objectives of the Bank.

Effective policymaking and intervention in economic sectors by the Bank require an understanding of the past behaviour of economic variables and the future path of macroeconomic indicators. This is of importance in the areas of:

- forecasting inflation, real GDP, external reserves, etc.;
- actions required to stabilise the exchange rate; and
- determining the level of money supply that would support growth without causing inflation.

Also, the evaluation of policy outcomes is part of the research focus of the Department, which provides the Management of the Bank with an informed basis for policy decisions.

Over the years, the Research Department has repositioned itself to carry out the task of effective policy and operations research by developing and continually improving the competencies of staff in macroeconomics, macroeconomic diagnostics, econometrics, financial programming, financial and economic report writing and presentation, sectoral analysis, statistical analysis, amongst others. In this regard, the Department has successfully developed and deployed suites of models for policy simulations, forecasting, and analysis, to support Management decisions. Some of the operational models include:

- Short-term Inflation Forecasting (STIF) Model for forecasting headline inflation and its components;
- Structural Vector Autoregressive (SVAR) Models for the forecasting of economic and monetary variables;
- Factor-Augmented Vector Auto-Regressive (FAVAR) Model for forecasting real and monetary variables; and
- Mixed Frequency Factor (FAMIDAS) and Dynamic Factor Models for real GDP growth forecasts.

Others include sectoral models used in forecasting short-run sectoral variables, a medium-sized macroeconomic model for quarterly forecasts, and the simulation of key macroeconomic variables. Also, Dynamic Stochastic General Equilibrium (DSGE) Model, Bayesian VAR, and State Space Model are routinely used for some specialized studies.

Apart from its primary responsibility of conducting valuable research to support management decision-making, the Bank also has a long-standing commitment to disseminating its research findings to the general public. One medium through which it achieves this is the *Economic and Financial Review (EFR)*, the Bank's flagship research journal, which is currently in its 60<sup>th</sup> volume. The EFR publishes research articles by the staff of the Bank and external contributors. The EFR and other research publications have a wide internet presence and can be freely accessed from any location in the world. Internally, policy memoranda based on in-depth research regarding developments in the domestic and global economies are produced, on a need basis, to support policy effectiveness.

To support our research and learning activities, the Bank maintains a standard library (with extensive e-resources) and an institutional repository (enabled by Digital Commons<sup>25</sup>). Staff can access several leading journals and other resources globally through the library. Thus, the library plays a key role in supporting operational and policy research efforts at the Bank.

In order to deepen the scope of our research and find solutions to the many challenges of the Nigerian economy, the Bank continues to collaborate with other relevant government agencies and local, regional, and international organisations, to find solutions to the many challenges of the Nigerian economy, in general, and the financial sector, in particular. For instance, apart from relating with other central banks across the world, the Bank also has close working relationships with the:

- Nigerian Deposit Insurance Corporation (NDIC);
- Nigeria Export-Import Bank (NEXIM);
- Centre for Econometric and Allied Research (CEAR);
- Leading Universities in Nigeria;
- Economic Community of West African States (ECOWAS);
- West African Monetary Institute (WAMI);
- West African Institute for Financial and Economic Management (WAIFEM);
- International Fund for Agricultural Development (IFAD);
- World Bank Group; and
- International Monetary Fund (IMF).

There are also instances of industry-wide research engagements and collaborations, such as the establishment of the Financial System Stability Committee (FSSC), comprised of all financial institutions in Nigeria. The major goal is to develop a macro-prudential framework and capabilities to mitigate the effects of adverse shocks on the financial system, sharpen intervention measures, and enhance effective management and resolution of any other functional anomalies.

So far, I have highlighted some of the key activities and resources within the vast scope of research at the CBN. In the next section, I shall be discussing some of the challenges faced in the course of carrying out policy and operational research at the Bank.

## 12.2 Challenges to Conducting Policy and Operations Research

Given that policy deals with the aggregate economy, challenges abound, especially for a developing economy like Nigeria, where structural rigidities tend to distort the functioning of the economy, negating free market economic theories. Some of these difficulties include:

- **Data-related problems:** Data is at the heart of any modelling process for policy. The key challenge with data centres on the level of aggregation, frequency, timeliness, accuracy, and unavailability in some cases. For instance, we are sometimes confronted with low as opposed to high-frequency data. There are also issues of unavailability of data on certain relevant variables, delayed reporting, incomplete reporting, discontinued series, and the quality of the data reported. Granted that the results of policy and operational research are as good as the quality of data used, poor data could, therefore, pose a major issue in research.
- **Capacity Constraints:** Although a lot of progress has been made in improving the quality of policy and operational research at the Bank, keeping pace with the constantly evolving

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<sup>25</sup> *Digital Commons* is a best-in-class hosted solution to openly publish, manage and showcase the full spectrum of institutional research and scholarship (see, <https://www.bepress.com>).

techniques and data treatment methods poses capacity constraints. For example, there is limited expertise in Big Data and Machine Learning at the moment, requiring a scaling up of training in that area.

- **Idiosyncratic factors:** There are certain idiosyncratic factors, such as the existence of a large shadow or informal economy (not captured by official statistics), which negatively affects the nature and quality of research output. The absence of well-functioning markets is another example. Thus, researchers are forced to make assumptions that might produce sub-optimal outcomes with adverse implications for policy.
- **Poor visibility of research output:** Despite the Bank's efforts in enhancing the visibility of its research output, there is still room for improvement in ensuring enough exposure to relevant citation databases such as Scopus, Clarivate Analytic's Web of Science/Publons, and others.
- **Inadequate research collaboration between the CBN, Nigeria Deposit Insurance Corporation, and other regulators in the Financial Sector:** Collaboration between regulatory authorities enhances research output due to the unique expertise and experiences of the independent bodies. However, there is still room for improvement in the level of research collaboration between the regulators in the Nigerian financial space.
- **Domestic environmental uncertainties and external vulnerabilities often obstruct the performance of forecasts:** Economic shocks have traditionally been found to reduce the forecast accuracy of economic models. For instance, the onset of the COVID-19 pandemic significantly affected the forecast accuracy of several key institutions, such as the IMF and World Bank, as output projections were markedly different from the actual output. Other examples include the impact of insecurity and fluctuation in oil prices on GDP and the inflation rate.
- **The emergence of new technologies such as blockchain technology and digital currencies:** Disruptive technologies such as blockchain technology and digital currencies have significant implications for the operations of the financial system, requiring concerted research efforts in most central banks. However, there are still research gaps in blockchain technology and big data due to limited expertise and resources.
- **Dynamic nature of the Global Banking Landscape:** The global banking landscape is always evolving, and incorporating advancements in the financial industry, such as new risk governance frameworks and accounting standards, could be challenging. Consequently, there is always pressure for research efforts at the CBN to be at pace with developments in the global banking landscape.

### 12.3 Overcoming the Challenges

The challenges faced in conducting policy and operational research could be overcome by ensuring the following:

- i. **Constant Capacity Building:** The capacity building should be beyond classroom engagements and should emphasize hands-on experience. To remain at the cutting-edge of knowledge, there must be constant updating of skills and capacity in emerging issues, such as artificial intelligence, Machine Learning, Big Data Analytics, Blockchain, and other emerging technologies and innovation, that are reshaping the financial sector global economy, in general.
- ii. **Update of the Research Framework:** The economy is dynamic, and so should models or frameworks of analysis. What drove aggregate variables in the past may no longer be important in today's world. Thus, a continuous revision of the framework to capture the

- relevance and reliability of the most important variables would help improve understanding of the economy and research output.
- iii. **Improvement in Data Quality and Availability:** There is a need to strengthen collaboration and support from data collection agencies. Given the role of the National Bureau of Statistics (NBS) as the agency statutorily in charge of data collection and dissemination, a more robust collaboration with other data-generating agencies like the Federal Ministry of Finance, Budget and National Planning, National Population Commission, National Identity Management Commission, Federal Inland Revenue Service, Nigerian National Petroleum Corporation, the Central Bank and others, is needed. The scope and nature of data collected should be in the form that enables research in relevant agencies and institutions. Also, the automation of activities should be fast-tracked to improve timeliness in data availability.
  - iv. **Reduction in the Size of the Informal Economy:** It is imperative to capture most of the informal activities in the databases to improve model outcomes. To achieve this, authorities (monetary and/or fiscal) could collaborate with the unions in charge of the players in the informal space. This way, participants in the informal space could be engaged and brought within the formal umbrella.
  - v. **Inter-disciplinary/Agency Collaboration:** There is a lot that could be achieved working together than working in Silos in the face of evolving economic problems. Deepening interdisciplinary and agency collaborations in modeling and research would facilitate the evolution of new ideas and hybrid solutions from various disciplines. Thus, engaging or bringing other disciplines on board in modeling and research efforts could produce better outcomes for policy.
  - vi. **Funding:** Effective and efficient policy and operational research require huge resources, including software purchases, access to data, capacity development, and so on. Although the CBN has done a lot in terms of support to research activities within and outside the Bank, the story is markedly different elsewhere, especially the Universities and other research-based institutions. In view of resource constraints faced by some of the institutions and agencies, the private sector should be encouraged to provide additional support as part of their corporate social responsibility.

#### 12.4 Emerging Issues for Further Policy and Operational Research

As the world economy continues to evolve, new issues are also emerging on the horizon, which is reshaping the focus of policy and operational research for most institutions and economies across the world. Some of these issues that have dominated the policy landscape in recent times include:

- **The COVID-19 Pandemic.** Since the outbreak of the pandemic, a lot of studies and efforts have been channeled to evaluating the many aspects in which the crisis has impacted or would impact the various sectors of the economy. The pandemic has brought unprecedented disruption to the world economy, with many businesses and institutions introducing work-from-home policies to limit infection and further exposing new types of challenges. Despite the global vaccination efforts<sup>26</sup>, the new cases of infections and the emergence of new variants of the virus in some parts of the world indicate that the battle against the COVID-19 pandemic is not yet over. This would continue to pose significant concerns and uncertainty to policy forecast,

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<sup>26</sup> For instance, while vaccination rates in advanced economies like the US, UK and EU was over 70 per cent, the pace of vaccination in developing economies stood at 8.4 per cent in Ghana, 14.2 per cent in Nigeria, 26 per cent in Egypt and 30 per cent in Egypt as at 7<sup>th</sup> Feb, 2022 (Source: Ourworldindata.org/COVID-vaccinations and National Primary Health Care Development Agency).

business operations, investments, and economic outcomes and therefore call for more research attention.

- **Rising Insecurity:** The spate of insecurity around the world presents a significant threat to the world's economic prospects and development. Security challenges ranging from insurgency, terrorism, kidnappings, and banditry are assuming new dimensions. Available statistics indicate that the incidence of insecurity in Nigeria increased by 4.37 per cent in November, compared with October 2021, as the number of kidnappings and deaths rose<sup>27</sup>. The persisting insecurity and banditry, which have continued to impact agricultural activities and food prices negatively, particularly in Nigeria, are yet to attract enough research attention. Empirically, little is known about the economic costs of terrorism in Nigeria, especially regarding its impact on growth, humanitarian crisis, and resource reallocation from other social sectors of the economy. This throws up fresh challenges for policy and operational research.
- **Cryptocurrencies.** The emergence of new innovations and technologies like cryptocurrency has attracted the attention of policymakers in recent times, particularly as it impacts the conduct of monetary policy. Crypto currency runs on a protocol operated by a predefined algorithm, making its management fully automated and unregulated as the principal actors behind the algorithm remain anonymous. Mindful of its disruptive impact and risks to the mainstream financial system (including money laundering), most Central Banks have taken cautious approaches, restricting transactions on cryptocurrency<sup>28</sup>. However, as technology continues to evolve, new dimensions of research are increasingly required to evaluate the threats as well as the new opportunities posed by cryptocurrencies, not only for the financial sector but for employment and economic growth.
- **The Emergence of Central Bank Digital Currencies (CBDCs), Financial Technology (FinTech), Regulatory Technology (RegTech), and Supervisory Technology (SupTech).** The increasing pace of technological advancement has necessitated the deployment of various innovative financial solutions and platforms to deepen financial inclusion and foster economic growth. However, every new product comes with different layers of risks that cannot be ignored. This creates new opportunities for research efforts. There should be continuing studies on the FinTech space to improve the effectiveness of digital currency on the Nigerian economy.
- **Risk Management in The Banking System, Bank Liquidation, Bank Fraud, Forgeries, and Cyber Security.** Safeguarding the health of the banking system has remained one of the cardinal objectives of the Central Bank of Nigeria. To this end, the Bank has continued to evolve measures to checkmate any form of threat arising from cyber security, money laundering, and others. To the extent that threats that come from technological innovations can be daunting, every research effort around this direction would be useful in fine-tuning the existing risk management framework.

## 12.5 Prospects for Collaboration with other Agencies

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<sup>27</sup> Council on Foreign Relations-Nigeria Insecurity Tracker.

<sup>28</sup> For example, CBN launched her CBDC, known as eNaira, on October 25, 2021, to promote financial inclusion, foster cross-border trade, increase remittances and enable the government to make welfare payments more easily. (Source: <https://african.business/2021/10/finance-services/>).



Over time, the CBN has developed reasonable capacity and competence in the handling of monetary and financial statistics. However, as the monetary sector does not operate independently of the rest of the economy, the Bank also conducts research in the other sectors of the economy. For instance, the Bank has had many collaborations with the National Bureau of Statistics towards the compilation of the national accounts and other studies and surveys aimed at improving policy delivery in the economy.

Collaboration is important because, with the combination of expertise and resources, it is much easier to answer bigger and more complex scientific questions and expand the scope of research. Collaborative research projects offer many benefits, such as:

- Maximisation of Impact;
- Network Expansion;
- Embracing New Opportunities to Learn New Skills;
- Gaining New Perspectives;
- Shared Responsibility; and
- Stimulating Discussions with Experts in Complementary Fields.

Given the importance which the Bank accords collaborative studies, many avenues have been created to facilitate mutually-beneficial relationships with other agencies. For instance:

- The Bank is open to visiting scholar programme. Participants could visit the Bank over an agreed period to conduct research in-house on issues that support the mandate of the Bank;
- The Bank could co-organize Biannual Research Conference with other agencies. The Conference will attract international scholars (IMF and the World Bank), who will come to share their knowledge in the field of research on new methodology, big data, AI, and new modelling technique;
- The Bank could collaborate on model building and macroeconomic diagnostics for a better understanding of current and emerging banking supervision issues; and
- The Bank could partner with NDIC, in particular, to develop a range of recovery and resolution strategies. Through collaboration, we could also develop and build Macroprudential Stress Testing Model (with NDIC) for innovative banking supervision.

## **12.6 Conclusion**

The importance of policy and operations research cannot be over-emphasized. This paper has stressed this fact, given that the effectiveness of policy depends, in part, on the quality of research. The various research efforts in the Bank have been highlighted, underlining the challenges and opportunities for collaboration. The paper reiterates the position that collaboration among different agencies would deliver better policy research outcomes than when agencies work in silos. Particularly, collaborations in the areas of research projects, seminars, capacity building, knowledge sharing, exchange programmes, and research on emerging issues in the banking sector would be mutually beneficial.