numeritics
Analytics and Evaluation

ASSETS AND LIABILITIES MANAGEMENT

OVERVIEW

Given the challenges within the financial sector, financial institutions need to rethink their strategies in order to stay competitive and provide superior returns to shareholders. Determining the optimal composition of these organizations' portfolio is central to this strategy. The ideal composition cannot be obtained without considering the interactions that exist among the structure of the institution's liabilities, equity and the composition of its assets. The proposal presents a robust approach that will achieve this through the use of a multiple criteria decision analysis (MCDA) model. The model will address management objectives as well as operational constraints with a view towards ensuring an adequate level of liquidity, mitigating exposure to risks and enhancing shareholder's value.

OBJECTIVES

The primary objective of the proposal is determining how financial institutions can minimize exposure to various forms of risks while maintaining the appropriate combination of assets and liabilities that maximize shareholders' wealth. Specific objectives the proposal will address include:

- SIMULTANEOUS CONSIDERATIONS OF ASSETS AND LIABILITIES TO SATISFY BOTH LIQUIDITY CONCERNS AND ACCOUNTING PRINCIPLES.
- THE INCORPORATION OF UNCERTAIN RATES IN THE DECISION-MAKING PROCESS IN CONSIDERATION OF A WIDE VARIETY OF POTENTIAL SCENARIOS;
- CONSIDERATION OF CONSTRAINTS – LEGAL, ENVIRONMENTAL AND POLICY APPROPRIATE TO THE ACTIVITIES OF THE FINANCIAL INSTITUTION;
- THE EVALUATION OF THE INSTITUTION'S HEALTH THROUGH THE GENERATION OF STRESS TEST SCENARIOS.

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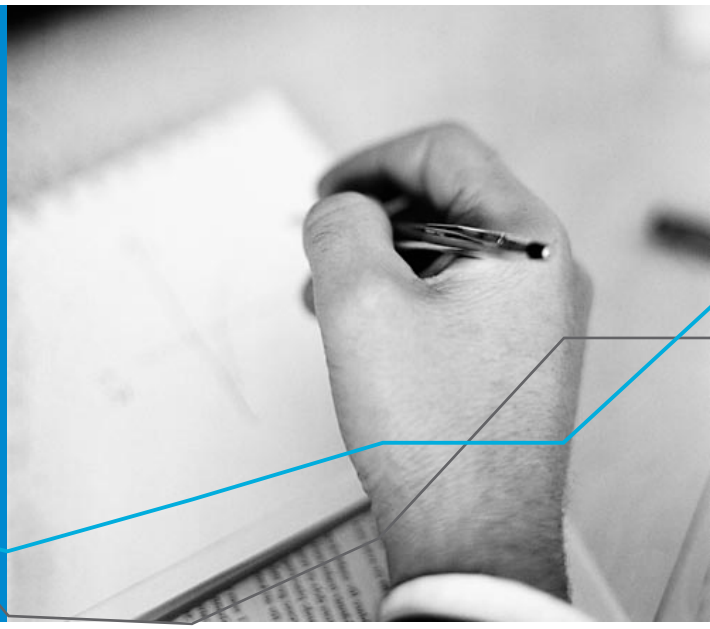
DELIVERABLES

- The optimal size of deposits that the institution wishes to attract and the value of the loans that it intends to provide;
- The combination of risk-return tuples that maximizes profits and ensures the long term sustainability of the organization;
- The volume of the different forms of instruments in the bank's portfolio given that these securities have different characteristics in terms of their associated risk, return and uncertainty;
- Minimization of transaction costs associated with the sale of assets prior to maturity and the synchronization of cash flows by matching maturity of assets with expected cash outflows.

TARGET INDUSTRIES

Financial institutions: Banking industry; discount houses; insurance, reinsurance and assurance companies; stock brokerage firms; mortgage institutions; pension fund custodians; finance companies; microfinance banks and development finance institutions.



MODEL SOFTWARE

The financial model will be tailored to the needs of the client and it will build on the information obtained from management. This includes the definition of objectives, their associated priorities and the identification of key operational issues and constraints. The model will subsequently be implemented by employing customized software that is created using software developer kits. The bespoke software will combine both Monte Carlo simulation methods and genetic algorithm optimization techniques. This combination provides powerful features that address uncertain variables within the model and ensure that global solutions are generated during the optimization phase. Depending on the client's preferences, other decision tools such as neural networks and decision trees could also be included and the application could run on a multitude of different platforms. For example, the application could run in an excel environment, as a web-based product, a stand-alone executable software or deployed enterprise wide.

PRICING

Pricing to be determined based on the findings of the assessment report prepared in response to client needs and the scope of the project.

PROJECT CONTACT

Tayo Fabusuyi is the lead strategist at Numeritics, an adjunct professor of economics at Carnegie Mellon University and a consulting partner with Palisade Corporation, maker of software for risk and decision analysis. His areas of expertise are in the modeling and analysis of prioritization and allocation issues, predictive and financial modeling, outcome-based performance measures and strategic planning processes. He has more than a decade of experience in the field of Operations Research and his expertise in multiple criteria decision analysis (MCDA) has been utilized in determining how banks can minimize exposure to various forms of risks while maintaining the appropriate combination of asset and liability that maximizes shareholders' wealth. It has also been applied in the manufacturing sector where he has conceptualized and implemented MCDA models that align firms' operational activities with their strategic goals. He holds dual honors in Computer Science and Economics from the University of Ife, Nigeria, an M.Sc. in Public Policy and Management with highest distinction from Carnegie Mellon University, Pittsburgh, Pa. and an M.Phil. in Economics from the University of Oxford where he was an American Institute of Economic Research Fellow. Tayo has given presentations at conferences and meetings of various Operations Research/Management Science societies on productivity and resource allocation issues and he is an active member of the American Economic Association and the Institute for Operations Research and Management Science.

Numeritics is a Pittsburgh based Analytics and Evaluation consulting practice. Numeritics provides superior returns to its clients by offering best practices that are tailored to address clients' needs and that are informed by applied research. The firm's associates operate at the frontiers of knowledge in their respective fields backed by years of experience providing research, consulting and advisory services in the private, public and the nonprofit sectors.

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