

## From Rules to Analytics: A Comprehensive Review and Interplay of IBC in Bank Fund Management



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*Banking plays a pivotal role in the IBC as it serves as the primary source of funding for businesses and is a key stakeholder in the resolution of corporate debtors. Therefore, a robust system for bank fund management is crucial for ensuring availability of credit, promoting entrepreneurship and resolution process. The present article provides an in-depth exploration of the evolution of various scientific approaches to bank fund management, tracing the progression from traditional practices to sophisticated data-driven methodologies, which will be useful for Insolvency Professionals and other stakeholders of the IBC. Besides, it offers a critical evaluation of the practical application of these models in formulating effective banking strategies.*

**Read on to know more...**

### 1. Introduction

The management of bank funds has undergone a dramatic transformation over time. Initially, banking decisions were largely guided by experience, regulatory requirements, and prevailing economic conditions. However, the increasing complexity of financial markets and the advent of sophisticated analytical tools have spurred the integration of econometric and operational research methodologies into bank fund management.

This shift has facilitated a more structured and data-driven approach to optimize bank portfolios, moving away from reactive responses to proactive strategies. This article

provides a comprehensive overview of the theoretical and empirical advancements in this dynamic field, categorizing key research contributions into five principal approaches, their applications in the Indian context and futuristic overview.

### 2. Approaches to the Management of Bank Portfolios:

- (a) Traditional Approach
- (b) The Explanatory Approach
- (c) The Inventory Theoretical Approach
- (d) Optimization using Preference Functions
- (e) Optimization using Operations Research Techniques

**(a) Traditional Approach**

Early attempts to formalize bank fund management led to the development of several influential, albeit simplified, theories. One of the earliest structured theories was proposed by Roland Robinson<sup>1</sup> (1962), who emphasized the dual, often conflicting, objectives of safety and profitability. His hierarchical rule established a sequential approach to fund allocation, prioritizing:

- i. Meeting legal reserve requirements mandated by the central bank.
- ii. Allocating funds to secondary liquid assets, providing a buffer against unforeseen withdrawals.
- iii. Satisfying customer credit demands, the core business of lending.
- iv. Investing in long-term securities as a residual decision, after fulfilling the more immediate needs.

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While this framework provided a basic understanding of liquidity management, it largely overlooked the crucial influence of interest rates on portfolio selection, thereby limiting its applicability in the face of fluctuating market conditions. Delong<sup>2</sup> (1966) introduced the “coated funds approach,” which is a more nuanced model that suggested investments should be strategically aligned with the specific sources of funds. This model recognized the varying liquidity requirements associated with different funding sources, allowing for a more refined balancing of profitability and liquidity.

**(b) The Explanatory Approach**

As financial markets evolved, researchers sought to develop more robust models that could explain the factors driving banks' fund allocation decisions. This led to the emergence of the explanatory approach, which aimed

to quantify the relationships between various economic variables and bank portfolio choices. Meigs<sup>3</sup> (1962) and Hodgman<sup>4</sup> (1963) made significant contributions by developing models that incorporated reserve behaviour (the practice of banks wherein they manage reserves actively based on expectations, liquidity needs and regulatory environments instead of assuming a fixed reserve ratio) and the importance of maintaining strong customer relationships, respectively. Their findings challenged the notion that banks passively responded to regulatory constraints and demonstrated that banks actively manage their portfolios to balance risk, return, and liquidity.

Goldfeld<sup>5</sup> (1966) further advanced this approach by classifying banks into city member and country member banks, recognizing the heterogeneity within the banking sector. His research revealed that asset allocation strategies often differed significantly based on regional economic dynamics. Goldfeld's model incorporated investment and consumption behaviour, effectively linking financial market conditions to portfolio adjustments. Brechling and Clayton<sup>6</sup> (1965), focusing on British banks, provided further refinement by distinguishing between liquid assets, investments, and customer advances. Their regression-based empirical analysis offered valuable insights into how banks respond to monetary policies and navigate economic cycles.

**(c) The Inventory Theoretic Approach**

The inventory-theoretic approach, with its roots in the work of Edgeworth<sup>7</sup> (1888), provides a framework for understanding how banks manage their liquid assets, analogous to how businesses manage their inventory. Porter<sup>8</sup> (1961) formally applied operational gaming principles to bank fund management, suggesting that banks should strive to maximize profits while simultaneously maintaining adequate liquidity buffers to absorb random deposit fluctuations. This approach acknowledges the inherent uncertainty in deposit flows and the need for banks to hold liquid assets to meet unexpected withdrawals.

Morrison<sup>9</sup> (1966) and Poole<sup>10</sup> (1969) expanded on Porter's work by introducing stochastic models that integrated

<sup>1</sup>Robinson, R. (1962). *The management of bank funds*. McGraw-Hill.

<sup>2</sup>Delong, G. (1966). The coated funds approach to bank portfolio management. *American Economic Review*.

<sup>3</sup>Meigs, W. B. (1962). *Free reserves and the money supply*. University of Chicago Press.

<sup>4</sup>Hodgman, D. R. (1963). Commercial bank loan and investment policy. *Journal of Finance*, 18(2), 333–353.

<sup>5</sup>Goldfeld, S. M. (1966). *Commercial bank behaviour and economic activity: A structural study of monetary policy in the postwar United States*. North-Holland Publishing Company.

<sup>6</sup>Brechling, F. P. R., & Clayton, R. A. (1965). The behaviour of banks and the supply of money in the United Kingdom. *Cambridge Economic Policy Review*.

<sup>7</sup>Edgeworth, F. Y. (1888). The mathematical theory of banking. *Journal of the Royal Statistical Society*.

<sup>8</sup>Porter, R. D. (1961). A model of bank portfolio selection. *Federal Reserve Bulletin*.

<sup>9</sup>Morrison, G. W. (1966). Reserve management and the theory of optimal bank portfolios. *Journal of Political Economy*.

<sup>10</sup>Poole, W. (1969). Commercial bank reserve management in a stochastic model: Implications for monetary policy. *Journal of Finance*, 24(5), 769–791.

cash reserve management with expected loan demand fluctuations. These models explicitly incorporated the role of uncertainty in shaping bank portfolio decisions, providing a probabilistic framework for determining optimal reserve allocations. The inventory-theoretic approach emphasizes the trade-off between the opportunity cost of holding liquid assets and the risk of running short of funds.

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#### (d) Optimization using Preference Functions

A significant advancement in bank fund management approach came with the introduction of utility-based preference functions. Kane and Malkiel<sup>11</sup> (1968) argued that banks, like individuals, seek to maximize expected utility rather than simply focusing on maximizing returns. Their model differentiated between standard loan accounts and optimal loan level ( $L^*$ ), which, despite their inherent volatility, exhibit risk-reducing characteristics within the overall portfolio. This insight highlighted the importance of considering the diversification benefits of different asset classes.

Parkin, Gray, and Barrett<sup>12</sup> (1970) further developed this methodology by incorporating explicit utility functions, enabling more precise modelling of risk-adjusted portfolio selection. Their empirical analysis provided strong support for the hypothesis that banks aim to maximize long-term utility, reflecting a preference for sustainable profitability over short-term gains. This approach allows for a more nuanced understanding on how banks' balance the risk and return in their portfolio decisions.

#### (e) Optimization using Operations Research Techniques

The development of powerful computational techniques opened up new possibilities for optimizing banks'

portfolios. Operational research techniques, such as linear programming, dynamic programming, and stochastic programming, provided banks with the tools to solve complex optimization problems involving numerous constraints and variables. Chambers and Charnes<sup>13</sup> (1961) were pioneers in applying deterministic linear programming to bank fund allocation, while Cohen and Hammer<sup>14</sup> (1967) introduced dynamic modelling techniques that incorporated capital adequacy constraints, a crucial aspect of bank regulation.

Chen<sup>15</sup> (1974) and Crane<sup>16</sup> (1971) further refined these methods by integrating wealth maximization frameworks and stochastic programming. Their models demonstrated how banks could achieve optimal asset allocation through the use of predictive analytics and probabilistic forecasting. These advanced techniques allowed banks to consider a wide range of scenarios and optimize their portfolios, accordingly.

## 2. Application in the Indian Context

Research on bank fund management has also flourished in the Indian context. Siddharthan and Kushro<sup>17</sup> (1975) developed econometric models specifically tailored to the unique characteristics of the Indian financial system. Chitre<sup>18</sup> (1978) conducted empirical research to validate inventory-theoretic models using Indian banking data, highlighting the specific constraints and regulatory challenges faced by Indian banks. These studies underscore the importance of adapting general approaches to the specific institutional and economic context of different countries.

## 3. IBC and Bank Fund Management

Banking is a crucial segment in the insolvency law, we can say that the resolution of the big companies going bankrupt is decided by the Committee of Creditors (CoC), who are representatives of banks, hence studies in this segment and fund management of banks is indirectly related to the economy.

Bank fund management involves the strategic handling of a banks' financial resources to ensure efficient utilization, maximize returns, and mitigate risks. This typically

<sup>11</sup> Kane, E. J., & Malkiel, B. G. (1968). Bank portfolio allocation, deposit variability, and the availability doctrine. *Quarterly Journal of Economics*, 82(1), 113–135.

<sup>12</sup> Parkin, M., Gray, J., & Barrett, J. (1970). Bank portfolios and utility functions. *Economica*.

<sup>13</sup> Chambers, R. G., & Charnes, A. (1961). Application of linear programming to bank funds management. *Journal of Financial and Quantitative Analysis*.

<sup>14</sup> Cohen, K. J., & Hammer, F. S. (1967). Linear programming and bank asset management: A survey. *Journal of Financial and Quantitative Analysis*.

<sup>15</sup> Chen, A. H. (1974). Bank portfolio selection: A stochastic programming approach. *Journal of Finance*, 29(4), 1105–1118.

<sup>16</sup> Crane, D. B. (1971). A stochastic programming model for commercial bank bond portfolios. *Management Science*, 17(11), B658–B673.

<sup>17</sup> Siddharthan, N. S., & Kushro, D. P. (1975). Fund management in Indian commercial banks: An econometric approach. *Indian Journal of Economics*.

<sup>18</sup> Chitre, V. S. (1978). Application of inventory-theoretic models to Indian commercial banks. *Indian Economic Journal*.

## Article

### THE RESOLUTION PROFESSIONAL

includes managing liquidity, investment portfolios, and capital to support banks' operations and regulatory requirements. The Insolvency and Bankruptcy Code (IBC), enacted in 2016, plays a crucial role in bank

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fund management by providing a structured framework for dealing with corporate insolvency and bankruptcy processes. Here's how they are linked:

- (a) **Risk Assessment:** Under the IBC, financial institutions are required to assess the risk associated with their loans more effectively. A better understanding of potential defaults can improve fund management strategies.
- (b) **Recovery Processes:** The IBC streamlines the process for recovering dues from defaulting borrowers, which can enhance banks' liquidity and financial health. Effective fund management must take into account the likelihood of recovery and timing.
- (c) **Capital Allocation:** The IBC encourages banks to allocate capital towards more productive assets by encouraging resolution of stressed assets, thereby optimizing the overall fund management strategy.
- (d) **Regulatory Compliance:** Banks must comply with the IBC regulations, which can influence their fund management approaches, especially in terms of maintaining capital adequacy and provisioning for bad debts.
- (e) **Investment Decisions:** Knowledge of the IBC's impact on borrowers' behaviour can influence banks' investment strategies and their risk appetite, affecting how they manage and diversify their funds.

In essence, sound bank fund management practices are vital for navigating the implications of the IBC, as they can significantly affect a bank's stability, profitability, and compliance with regulatory frameworks. Banking plays a pivotal role in the IBC as it serves as a primary source of funding for businesses and a key stakeholder in the insolvency process. Here are several ways in which banking is crucial in the context of the IBC:

- (a) **Credit Provision:** Banks are significant lenders to corporations, providing the necessary finance for operations and expansion. When companies default on these loans, the IBC provides a mechanism for banks to recover their outstanding dues through a structured resolution process.
- (b) **Role as Financial Creditor:** Under the IBC, banks are classified as financial creditors, which gives them specific rights and powers in the insolvency proceedings. They have a say in the CoC and can influence the decisions regarding the Resolution Plan.
- (c) **Claim Representation:** Banks can file claims for the amounts owed to them during the Corporate

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Insolvency Resolution Process (CIRP). This ensures that their interests are protected, and they have an opportunity to recover funds.

- (d) **Facilitating Restructuring:** The IBC encourages the restructuring of stressed assets, allowing banks to negotiate resolutions that can help turn around financially troubled companies, thereby potentially preserving jobs and economic value.
- (e) **Impact on NPA Management:** The IBC seeks to address the issue of Non-Performing Assets (NPAs) in the banking sector, encouraging timely resolution of defaults. This can help banks maintain healthier balance sheets and improve overall financial stability.
- (f) **Risk Mitigation:** By providing a clear framework for bankruptcy resolution, the IBC helps mitigate risks associated with lending, making banks more willing to provide credit, which in turn supports economic growth.
- (g) **Transparency and Speed:** The IBC aims to expedite the resolution process and provide better transparency, thereby enabling banks to make informed decisions regarding their lending practices and fund management strategies.

Overall, the interaction between banking and the IBC is

critical for ensuring that the financial ecosystem operates smoothly, reducing the impact of corporate defaults, and contributing to the overall stability of the economy.

#### 4. Conclusion and Future Research Directions

The evolution of bank fund management approaches has significantly enhanced decision-making within financial institutions. While traditional approaches primarily emphasized liquidity management, modern frameworks incorporate risk-return trade-offs, dynamic economic conditions, and the complexities of modern financial markets. The increasing availability of data and the development of advanced analytical tools have empowered banks to make more informed and strategic decisions.

Looking ahead, several promising avenues for future research warrant exploration:

- (a) **The Impact of AI and Machine Learning:** The application of Artificial Intelligence and Machine Learning techniques have the potential to revolutionize bank fund management. These technologies can be used to analyse vast amounts of data, identify patterns, and develop predictive models that can improve portfolio optimization, risk management, and customer service.
- (b) **The Role of Digital Banking:** The rise of digital banking is transforming liquidity management and creating new opportunities as well as challenges for banks. Real-time payment systems, mobile banking, and other digital platforms are changing the way customers interact with banks, requiring banks to adapt their liquidity management strategies.
- (c) **The Application of Behavioural Finance Principles:** Integrating behavioural finance

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principles into portfolio selection can provide a more realistic understanding of bank decision-making. Recognizing the influence of cognitive biases and psychological factors can lead to the development of more robust models that better capture the complexities of human behaviour in financial markets.

As banking systems continue to evolve, the integration of advanced analytics, automation, and a deep understanding of human behaviour will be crucial for optimizing asset allocation, enhancing financial stability, and ensuring the long-term success of banking institutions. Further research in these areas will be essential for navigating the challenges and capitalizing on the opportunities presented by rapidly changing financial landscape.

There is a great need for the banks to adopt sound fund management practices to navigate challenges such as credit risk, market fluctuations, and regulatory changes. An effective fund management contributes to a bank’s resilience and can improve profitability. The evolving landscape of banking fund management, including the impact of technology, changing regulatory environments, and the importance of sustainable practices are some key aspects of the growth in our economy. The effective fund management practices are essential for ensuring financial health, protecting stakeholders, and supporting economic growth of the country.

