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Acharya Management Business and Entrepreneurship Review

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Editorial

Dear Readers,

I am very happy to place before you Volume 16 and Issue 1 of AMBER on the theme 'Emerging Trends in Banking'. The Indian banking industry has been on an upward trajectory aided by strong economic growth, rising disposable incomes, increasing consumerism and easier access to credit. Digital modes of payments have grown by leaps and bounds over the last few years. The issue contains Empirical articles, Review Papers, Student paper, Case Study and Book Review. The article 'TReDS as Catalyst for Mitigating the Financial Hardships of MSMEs' authored by Dr. J. Madegowda describes how TReDS serves as an effective catalyst in improving the financial health of MSMEs by addressing issues such as delayed payments, working capital constraints, and limited access to formal credit. The article 'Comparative Analysis of Asset-Liability Management: A Study of ICICI Bank and HDFC Bank', authored by Anoj B.R and T.N Kavitha presents a comparative analysis of Asset Liability Management (ALM) practices at two major Indian banks, HDFC Bank and ICICI Bank, to understand their approaches to balancing assets and liabilities while managing associated financial risks. The article 'Analysis of The Aviation Sector in India and China: Corporate Restructuring and Financial Performance' authored by Harini B and Dr.Sreeanandan examines the financial performance of airlines before and after restructuring by analyzing key financial distress factors and the influence of institutional frameworks in India and China. The article 'An Overview on The Impact of AI and Other Technologies on Banking Sector' authored by Pranav Varma and Varun Kumar D examines the important developments in the banking industry, including how blockchain changes payment systems, how digital banking and artificial intelligence affect customer experience, the security risks associated with digital transformation, and the legal frameworks governing these emerging technologies. The article 'Assessing Financial Health and Banking Finance Impact on Startups in India: A Ratio-Based Analysis' authored by Dr. Baranipriya A and Dr. Sreeanandan explores the multifaceted challenges faced by startups in India in accessing banking finance and evaluates the financial health of lending institutions to understand the broader implications for startup funding. The article 'A Study on The Issues of Non-Performing Asset (NPAs) Among The Indian Banks: Government & RBI Measures' authored by Sujay G Gowda, the study delves into the critical issues surrounding NPAs in India, exploring their risk profile among Indian banks, consequences, and trends of NPAs from year to year, comparison between public and private sector banks NPAs, India's position in global level, bad loans and Government and RBI measures to address the challenges of NPAs. The article 'Green Banking In India: A Study of Adoption by Indian Banks' authored by Dr. Priyanka.I and Dr. Afsal EM combines a review of existing literature with a survey of Indian banks to assess the adoption of green banking practices. The article 'Cash Management System: A study with reference to Oman Oil Marketing Co SAOC, OOMCO' authored by Dr.Varalakshmi Subramani, Zakariya Hamed Al-Hinai, Ziyad Rashid Al-jahwari, Dua Salim Al-Amri, Fatma Musabah Alkaabi and Safa Hassan Al-Balushi analyses the techniques of cash management, how does the cash management influence the OOMCO and how does the cash flow statement influence the performance of OOMCO. The article 'A Study on 'Digital Payment Systems: Emerging Trends and their Impact on Consumer Behavior in the Banking Sector of Thane District, Maharashtra' authored by Ms. Mubina Shaikh is about the adoption and impact of emerging digital payment systems on consumer behavior. The Case Analysis –'How AI Changing the Banking Industry in 2025' authored by Dr. Prabakaran J explores the ten essential benefits AI will bring to the banking sector. The book review written by Avinash Laxman Naik and Dr. Mehjabeen on 'The Psychology of Money' authored by Morgan Housel makes this issue rich and useful to all, who are interested in the theme.

I congratulate my colleague, Dr.Roshni. P.R who has painstakingly edited this issue. I profusely thank Professor.

Next issue of AMBER would be in the Thirty Two (Volume 16 Issue 2) on the theme '**Macroeconomics, Finance and Banking**'. I welcome articles on sub themes 'Innovation, Digital currency, Fintech, and AI', 'Macroeconomics of climate change', 'Behavioural and Heterogeneous agent models in Macroeconomics and Finance', 'Productivity and Economic Growth', 'Macroeconomic Implications of a Trade War', 'Reserve currencies and central bank balance sheets', 'Monetary policy spillovers, co-movement of capital flows, and the Impossible Trilemma', 'Macro shocks and firms' financial choices', 'Monetary policy transmission to firms and households', 'Debt sustainability and sub-national finances' and on any other relevant topic.

Dr. H.R.Venkatesha,
Chief Editor-AMBER,

Director, Acharya Bangalore B School, Bengaluru.

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TReDS as Catalyst for Mitigating the Financial Hardships of MSMEs

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Abstract

Micro, small, and medium enterprises (MSMEs) are crucial to national development, contributing significantly to gross domestic product, employment, exports, and balanced regional development. However, they face numerous challenges, with financial constraints, particularly delayed payments for goods and services supplied on credit, being the most pressing. The Trade Receivables electronic-Discouinting System (TReDS) addresses this issue by allowing MSMEs to discount their trade receivables through multiple financiers "without recourse". This study uses government-sourced data to examine TReDS performance from 2017-18 to 2022-23. Employing descriptive statistics, compound annual growth rate, and one-sample *t*-test, the analysis reveals a consistent and significant improvement in TReDS performance. The study also reveals that TReDS serves as an effective catalyst in improving the financial health of MSMEs by addressing issues such as delayed payments, working capital constraints, and limited access to formal credit. This platform facilitates faster realization of trade receivables, enhances liquidity, and reduces the dependence on traditional financing methods while offering new business opportunities for banking companies and financial institutions. This study contributes to the existing literature by providing a comprehensive analysis of TReDS as a financial tool for MSMEs and offers insights for policymakers, financial institutions, and MSME owners to leverage TReDS effectively in addressing financial hardships.

Keywords: *Credit Risk Mitigation, Digital Lending Platforms, Invoice Discounting, MSME Financing, Trade Receivables, TReDS, Working Capital Management.*

Introduction

Micro, Small, and Medium Enterprises (MSMEs) play a significant role in the global economy, being recognized as key drivers of economic growth, innovation, and employment. Various studies have highlighted their importance, emphasizing their substantial contributions to economic progress, innovation, and job creation (International Finance Corporation, 2017). For example, in Zimbabwe, over 60% of economic activities are carried out by MSMEs (Cheza, 2023). Similarly, in Bangladesh, approximately 7.80 million small and medium enterprises contribute significantly to employment, supporting around 40 million individuals, representing roughly 70% of the industrial workforce (Toran., & Nema, 2023). This significance extends to India as well, a powerhouse in South Asia and one of the fastest-growing economies globally, currently (2024) ranked fifth in terms of gross domestic product (GDP). However, similar to many developing and under-developed economies, India faces challenges such as population growth, unemployment, inequality among regions and people, etc. MSMEs play a crucial role in addressing and mitigating these obstacles.

Many studies have emphasized the critical role of MSMEs in India's economic development and their significant contributions. In India, the MSME sector

has created employment opportunities for over 110 million individuals (second only to the primary/agricultural sector), contributing approximately 30% to the GDP, 45% to the total manufacturing output, and 40% to the country's exports (Gowda, Inchara P. M, 2020). Out of the nearly 633.88 lakh MSMEs in the country, 324.88 lakh enterprises, accounting for 51.25%, are located in rural areas, addressing the rural-urban imbalance and enhancing industrialization in under-developed and rural regions. This, in turn, ensures a more equitable distribution of income and wealth across the country, thereby contributing to balanced regional development. Additionally, they function as ancillary units to large-sized enterprises by providing crucial support (Chatnani, 2018).

However, despite their significant contributions, MSMEs have encountered obstacles hindering their ability to fully leverage their potential in driving economic development. These obstacles include lack of access to global markets, low technology levels, obsolete technology, inability to access modern technology, stiff competition, inadequate demand, problems in the supplies to government departments and undertakings, multiplicity of labor laws, complicated procedures associated with compliance with such laws, absence of a suitable mechanism for quick revival of viable sick enterprises, issues related to taxation, etc (Government of India, 2010). Challenges such as the non-availability of raw materials at competitive prices, shortages of skilled manpower across various domains including manufacturing, marketing, and services, managerial shortcomings, evolving business landscapes, and insufficient infrastructural support encompassing power, water, and transportation networks have impeded their growth trajectory. These challenges comprise both internal entrepreneurial factors and external factors like the business environment (Velmurugan et al., 2023). Similarly, many studies have underscored the pervasive challenges confronting MSMEs globally, including within the Indian context (Rachmawati et al., 2023).

Of the various challenges that plague MSMEs, the financial issue stands out as a significant barrier to their growth. There exists a substantial disparity between the financial assistance sought by MSMEs and what financial institutions provide, known as the "financial gap" (Raju., & Kurpad, 2013). A joint study by the International Finance Corporation and McKinsey & Company revealed that MSMEs in developing nations require a total credit of US \$ 8.9 trillion, whereas the current credit supply stands at just US \$ 3.7 trillion. This results in a finance gap of US \$ 5.2 trillion, representing 58.43% of the required funds, indicating that the available funds fall short of meeting 42% of the MSMEs' financial needs. Additionally, there is an additional demand of US \$ 2.9 trillion from informal enterprises in developing countries (International Finance Corporation, 2017).

In the Indian context, the prevailing challenges faced by MSMEs notably revolve around the insufficient availability of timely credit and the higher cost associated with it. As per an E&Y report, only about 14% of 64 million MSMEs have access to formal credit, and the credit gap in India's MSME sector stands at US \$ 530 billion. Furthermore, the rate of interest in India is comparatively high, averaging between 13-18%, in stark contrast to the 6-8% rates observed in certain developed economies. Additionally, the cost of borrowing from alternative sources is significantly steep, often ranging from 50 to 200% higher than from formal lending institutions. These heightened costs of capital acquisition significantly impede the competitiveness of MSMEs. Moreover, obstacles such as meeting stringent collateral requirements set by lending institutions and the limited accessibility to equity capital exacerbate the challenges faced by MSMEs in securing the necessary financial resources.

MSMEs, like other entities, sell their goods and services to both individual and institutional/corporate customers on both cash and credit basis. In the case of credit sales to industrial customers, the customers (i.e., buyer-entities) accept the bills (prepared by the MSME sellers) promising to pay the consideration on

or before a specific period say, in three months. These bills are called, "trade receivables." They denote the amount that the MSME sellers have invoiced to customers (for the goods/services delivered) but for which they have not received the payments (on the date of sales). This "sell now, receive later" is associated with an element of uncertainty about the timing and/or amount. Most importantly, it is causing multifarious ill effects on the MSME sellers. When the (industrial) customers delay the payments, the MSME sellers may be forced to resort to costly borrowings to meet their day-to-day legitimate expenses such as the purchase of raw materials, payment of employee benefit costs, payment of electricity bills, rent, etc., which in turn increases the finance cost of MSME sellers.

In the above situation, the Trade Receivables electronic-Discounting System (TReDS) provides a vital solution for MSME sellers by enabling them to receive immediate payment, instead of waiting until the end of the credit period, which may also be associated with the risk of partial or non-payment. In this context, the present paper aims to analyze different aspects of TReDS, including its procedural framework and overall performance.

Review of Literature – Problems, Contributions, Schemes, etc.

The literature review serves as a critical foundation for understanding the existing body of knowledge on MSME financing and the role of the TReDS in alleviating financial constraints faced by MSMEs. By systematically analyzing previous studies, this section identifies key trends, gaps, and theoretical frameworks related to MSME financial challenges, working capital management, and innovative financing mechanisms. By exploring the diverse perspectives on supply chain financing mechanisms, invoice discounting, and digital platforms like TReDS, this section seeks to identify the gaps in the current research. The insights gained from earlier works not only underscore the gravity of MSMEs' financial hardships but also provide a framework for demonstrating how TReDS can act as a

catalyst for mitigating these financial hardships of MSMEs. In this background, a review of a few earlier studies is presented below thematically.

Efficient management of trade receivables and payables is crucial for ensuring liquidity and financial stability in MSMEs. Svelana, Mihaila., & Violeta Codrean (2023) emphasize the significance of systematic monitoring and analysis of trade receivables and debts to maintain optimal financial performance. It is felt that employment of methodological and statistical-mathematical tools helps prevent excessive growth in receivables and payables, thereby reducing bankruptcy risks. Similarly, Ilieva & Tsonkova (2024) highlight the importance of assessing trade receivables through customer creditworthiness evaluations and optimal credit limit decisions. By applying these assessment models to Bulgarian enterprises, the study demonstrates their effectiveness in mitigating non-payment risks and sustaining MSME liquidity. These insights underline the necessity of structured receivables and payables management for the financial health of MSMEs.

There is a significant positive correlation between digital transformation and the enhancement of financial performance within the MSME sector, underscoring the considerable business advantages associated with the adoption of digitalization. To facilitate this progression, it becomes imperative to fortify internal factors, recognized as pivotal catalysts for expediting the digital transformation process (Jahroh et al., 2024). Examining the impact of bank stability and financial technology (FinTech) on the credit performance and access of MSMEs, it is noted that the growth of FinTech has facilitated their (previously denied) access to credit from traditional banking companies (Ismanto et al., 2023). Using the Cash Conversion Cycle theory in the context of Kenyan enterprises and analyzing secondary data from audited reports (2017-2019), a significant indirect effect of trade receivable management on the financial performance of the entities is found. Therefore, it is suggested for the adoption of optimal debt

management frameworks for sustainable financial performance (Owuor et al., 2021).

As the principal source of job creation, MSMEs in India play a crucial role in achieving sustainable development goals (Sathish & Sornaganesh, 2023). Apart from internal and external factors, the sustainability of MSMEs is significantly impacted by their adoption of sustainable practices, conducting ESG assessments (environmental, social, and governance), and prioritizing innovation and efficiency to enhance productivity, reputation, and attract top talent (Velmurugan et al., 2023).

Indian MSMEs encounter numerous hurdles, including limited access to finance, marketing and sales, technology adoption, lack of skilled manpower, regulatory compliance, inadequate infrastructure, etc (Sushil et al., 2022; Thouseef Ahamed & Amrutha Raju, 2023). The challenges faced by MSMEs also include constraints on expansion and modernization, improper product development, poor product promotion, low productivity, lack of business expertise, technological obsolescence, etc (Ali & Husain, 2014).

Financial literacy is a crucial determinant of MSME financial resilience and management effectiveness. The study by Dwyanti (2024) underscores the role of financial literacy in enabling MSMEs to make informed financial decisions, contributing to their sustainability, and facilitating the adoption of financial technologies such as TReDS. Furthermore, Bhushan (2013) examines the factors influencing financial literacy levels among individuals, finding that gender, education, and income significantly impact financial awareness, while age and geographic location do not. These findings suggest that targeted educational programs could enhance financial literacy, thereby promoting the effective utilization of financial innovations among MSMEs.

Along the lines of the above studies, a few more studies have examined the problems and challenges faced by MSMEs in India. Many MSMEs do not utilize budgets, lack long-term financial planning, fail to differentiate

their personal finances from business finances, and do not maintain proper accounting records (Lestari & Astuti, 2023). The funding landscape for MSMEs in India poses a significant challenge, with a substantial credit gap of \$530 billion. Most credit-deprived MSMEs in India are micro-enterprises. Access to credit remains a crucial issue for MSMEs, especially those in rural areas nationwide. Despite progress, these businesses still encounter significant hurdles in obtaining credit from formal banking institutions. Challenges include the inability to provide extensive records, collateral, and guarantees, necessary for loan approval. This persistent issue highlights the continued financial exclusion faced by many MSMEs, particularly in rural India. Compounding the problem, supply chain challenges for corporate clients, government entities, and related agencies have become unbearable for financially strained MSMEs. In addressing delayed payments to MSME sellers by industrial customers, TReDS has emerged as a savior in alleviating their financial woes (Vilas & Praveen, 2020).

The above literature review highlights that various aspects of MSME financial management, including trade receivables management, digital transformation, e-commerce adoption, and financial literacy, have received significant scholarly attention. Studies have extensively examined how digital strategies, financial awareness, and FinTech solutions contribute to MSME resilience and sustainability. However, the specific role of TReDS as a financial tool for mitigating liquidity challenges in MSMEs remains underexplored. This article seeks to address this gap by examining TReDS as a catalyst for improving MSME financial health, thereby contributing to the broader discourse on enhancing MSME competitiveness through innovative financial solutions.

Conceptual Framework

Before assessing the effectiveness of TReDS, it is essential to define the key terms and concepts that are fundamental to this study. This will ensure a precise comprehension of the framework in which this study

is conducted. The crucial terms include MSMEs, trade receivables, and TReDS.

According to the Industrial Development and Regulation Act of 1951, the category of "small industries" encompasses enterprises of a diminutive, cottage, traditional, and village nature, collectively referred to as "small-scale industries" or SSIs (Government of India, 1951). However, the MSME Development Act, 2006 provided the legal framework for identifying the concept of an "enterprise" which includes entities in both manufacturing and service sectors. Furthermore, the Act categorized the enterprises into 2×3 categories - initially into two categories as "manufacturing enterprises" and "service enterprises", and then, each of these two categories was divided into three tiers as micro, small, and medium enterprises (Ministry of Law and Justice, 2006).

However, on May 13, 2020, the Government of India (GOI) removed the initial classification and consolidated both manufacturing enterprises and service enterprises into one category named "manufacturing and service enterprises". The new definition of MSMEs is now determined based on the combined criteria of turnover and investment in equipment, which applies to both manufacturing and service enterprises. Additionally, the criteria for medium enterprises underwent further revisions on June 1, 2020 (Table 1).

Table 1: Criteria for Classification of MSMEs

Type of Enterprise	Investment in Equipment (? crores)	Turnover (? crores)
Micro	< 1	< 5
Smalle	= 1 < 10	= 5 < 50
Medium	= 10 < 20 = 10 < 50 ¹	= 50 < 100 = 50 < 250 ¹

With effect from June 1, 2020

Source: Collated the table using the data retrieved from, <https://msme.gov.in/>

The second term/concept widely used in this study is trade receivables, which arise when an entity sells goods and/or provides services on a credit basis to its customers. Trade receivables refer to the amount due to an entity on account of selling goods or rendering services in the normal course of business on a credit basis. Therefore, the selling entity has an unconditional right to such an amount of consideration. However, the selling entity has to wait for some time, for example, 45 days, to receive the amount from its customers. Additionally, in the case of credit sales, there is an element of uncertainty regarding both the timing (the buyer may take more time to pay than the credit period allowed) and the amount (due to bad debt). Nevertheless, the selling entity is deprived of immediate cash for the goods sold on credit basis. This problem becomes severe when bulk sales are made to industrial/institutional customers on credit basis.

Trade Receivables e-Discounting System (TReDS), the third and final concept/term used in this study, is a digital platform designed to facilitate the financing of trade receivables of MSMEs from corporate and other buyers. It enables MSMEs to auction/discount their trade receivables, providing them with immediate payment for their invoices instead of waiting for the credit period to expire.

Research Methodology

Below is a concise presentation of the pertinent methodological aspects employed in this research paper.

The primary objective of this study, as previously articulated, is to investigate and analyze the role, functioning, and impact of TReDS in mitigating the financial problems of MSMEs. In the process, it also aims to discuss other supporting aspects such as the procedure, players in the system, performance, etc. This study utilizes both qualitative and quantitative methodologies. The qualitative aspect examines the procedural functioning of TReDS, while the quantitative component evaluates its performance using relevant statistical data.

Further, a null hypothesis, H_0 : *There is no significant improvement in the operational performance of TReDS*, is formulated for testing and evaluating the performance of TReDS comprehensively. This hypothesis is designed to test each of the six parameters used to assess the performance of TReDS, namely: (i) number of invoices uploaded, (ii) monetary value of invoices uploaded, (iii) number of invoices financed, (iv) monetary value of invoices financed, (v) percentage of number of invoices financed to uploaded, and (vi) the percentage of monetary value of invoices financed to uploaded.

The literature and data required for this study are of a secondary nature and were collected from sources such as websites, including those of the Ministry of MSMEs and the Reserve Bank of India (RBI), research papers, government reports, etc. The study period covers six years, from 2017-18 to 2022-23 (the latest year for which complete relevant/required data are available). Descriptive statistical measures, namely mean and skewness, along with the compound annual growth rate (CAGR), are employed for the analysis and interpretation of data. To test the hypothesis, a one-sample t -test is conducted.

The study is limited by the unavailability of data for the initial year (2016-17) and the most recent year (2023-24) of TReDS' operation. Nonetheless, this limitation does not significantly affect the research findings.

TReDS as a Catalyst for Mitigating the Financial Hardships of MSMEs

Recognizing the pivotal role being played by MSMEs in bolstering the country's economic landscape alongside acknowledging the financial challenges they encounter, the GOI, RBI, etc., have devised and implemented a few schemes to help them in their financial problems. One such scheme in this direction (i.e., in the direction of mitigating the financial problems of MSMEs) is the launch of TReDS - an innovative e-platform for facilitating MSMEs to convert their trade receivables into cash without waiting till

the end of the credit period and without losing much value. In this context, a few important aspects of the system (TReDS) and its functioning/performance are enumerated below.

Initiative of the Apex Bank

As previously mentioned, MSMEs are encountering financial difficulties by selling part or all of their output to industrial customers on credit basis. In response to this nationwide concern (i.e., to facilitate the financing of MSMEs' trade receivables), the RBI conceptualized the establishment of TReDS in December 2014. TReDS is an online platform that enables MSME sellers/suppliers to discount their trade receivables and receive immediate payments (rather than waiting until the due date). This allows for the conversion of their trade receivables into liquid funds (i.e., cash) in a shorter period, thereby alleviating their financial challenges significantly.

TReDS serves as a pivotal mechanism enabling MSMEs to efficiently address their working capital requirements and reduce the ill effects of selling on credit basis, including increased finance costs due to delayed payments from corporate customers. This platform also has a lower annual interest payout for MSMEs and allows multiple financiers such as banking companies and non-banking finance companies (NBFCs) to participate. TReDS offers essential support to MSMEs grappling with financial constraints, facilitating the conversion of their trade receivables into readily available liquidity, thereby alleviating their operational challenges. The system is regulated by the RBI and aims to address the constraints faced by MSMEs in obtaining adequate finance. This measure further improves the cash flows of MSMEs and enhances the TReDS ecosystem by allowing more entities to participate in the platform. Furthermore, it ensures a transparent bidding mechanism, non-recourse financing for MSMEs, and payment to MSMEs within two days of bids being accepted by the MSME sellers. Additionally, the incorporation of blockchain technology within TReDS by the RBI ensures transparency (Bharti Harnal, 2019).

The TReDS not only enhances liquidity access for MSMEs but also serves as a strategic enabler for banks, NBFCs, and other financial institutions by offering new avenues for their business expansion. By participating in TReDS, these banking and financial institutions can increase their credit disbursement to MSME suppliers while mitigating credit risk through a structured, transparent, and technology-driven framework. The platform allows banks and NBFCs to finance trade receivables based on the creditworthiness of large corporate buyers rather than solely on the financial standing of MSMEs, thereby reducing default risk and enhancing asset quality.

Furthermore, TReDS streamlines the invoice discounting process through a competitive bidding mechanism, enabling banking and financial institutions to optimize their lending portfolios and improve capital allocation efficiency. The digital nature of TReDS ensures faster transaction processing, reducing operational costs and enhancing liquidity management. Additionally, by fostering deeper engagement with the MSME sector, banks and NBFCs can strengthen their market presence, contribute to financial inclusion, and align with regulatory imperatives promoting MSME financing. In essence, TReDS not only facilitates working capital support for MSMEs but also creates a mutually beneficial ecosystem where financial institutions can achieve risk-adjusted returns while supporting the broader economic objective of MSME sector growth.

TReDS – Operating Entities

Based on the aforementioned scheme, in 2017, the GOI authorized and granted licenses to three entities to operate TReDS platforms in the country. These entities are: (i) RXIL (Receivables Exchange of India Ltd - a joint venture of NSE and SIDBI), (ii) M1Xchange (of Mynd Solutions), and (iii) Invoice Mart (owned by 'A Treds Limited' - a joint venture of Axis Bank and mjunction). Recently, C2FO, a leading global on-demand working capital platform, went live, becoming the fourth platform to operate TReDS.

TReDS – Players/Participants

In the TReDS process, there are three participants/players: (i) Sellers – MSMEs as per the definition of the MSME Development Act, 2006, (ii) Buyers – corporate buyers including government departments, central public sector undertakings (CPSUs), and other entities permitted by the apex bank, and (iii) Financiers banking companies, NBFCs, financial institutions, and other institutions permitted by the apex bank.

Now, the apex bank has included insurance companies as the “fourth participant/ player” in the system. This move aims at broadening the scope of TReDS. This also entails facilitating insurance services for invoice financing, enabling entities and institutions to engage in factoring activities as financiers within TReDS, and allowing for rediscounting of invoices.

TReDS – Operational Procedure

The methodology of, and/or steps involved in, the working/functioning of TReDS are summarized below:

Step – (1): Creation of “Factoring Unit” (FU) on the TReDS platform by the MSME seller. “Factoring unit” is the standard nomenclature used in TReDS for invoices or bills of exchange (BOE) providing details of invoices/BOE (evidencing the sale of goods on credit basis by MSME seller to the buyer). Each factoring unit represents a confirmed obligation of buyers including the government departments and PSUs.

Step – (2): Acceptance of the factoring unit by the counterparty (i.e., the buyer-entity). After the MSME seller creates the factoring unit on the TReDS platform, the buyer-entity also logs on to TReDS and flags this factoring unit as “accepted”.

Step – (3): Financiers such as banking companies, NBFCs, etc., participate in the bidding process on the TReDS platform for factoring units. A specific window period is allotted for financiers to submit their bids. Importantly, financiers have the autonomy to determine the validity period of their bid prices. Additionally, the financiers involved in TReDS assess the creditworthiness/rating of buyers when preparing

their bids. Typically, they are hesitant to bid on payables linked to buyers with low credit ratings. Bid prices presented by financiers are exclusively available on the TReDS platform, accessible only to the MSME seller. This ensures the confidentiality of bidding details among financiers.

Step - (4): The MSME seller selects the optimal/best bid. The MSME seller has the freedom to accept any of the bids, and upon acceptance of a bid price, the respective financier receives notification from TReDS regarding the acceptance of the bid, etc. Once the bid price is accepted by the MSME seller, financiers do not have the option to revise or withdraw their bids placed online.

Step - (5): The TReDS sends due notification/intimation to the buyer and its (i.e., of buyer’s) bank informing them of payments due. The financier (of the selected bid) pays the MSME seller at the agreed rate of financing/ discounting (i.e., after deducting the discount).

Step - (6): Upon the expiration of the credit period, the financier obtains the payment from the buyer. In case the buyer fails to make the payment on the designated due date, it is considered a default, granting the financier the right to take suitable legal measures against the buyer. Nevertheless, any steps taken by the financier against the defaulting buyer are beyond the scope of TReDS.

The following pictorial presentation summarizes the above six steps in the working/ functioning of TReDS (Figure 1).

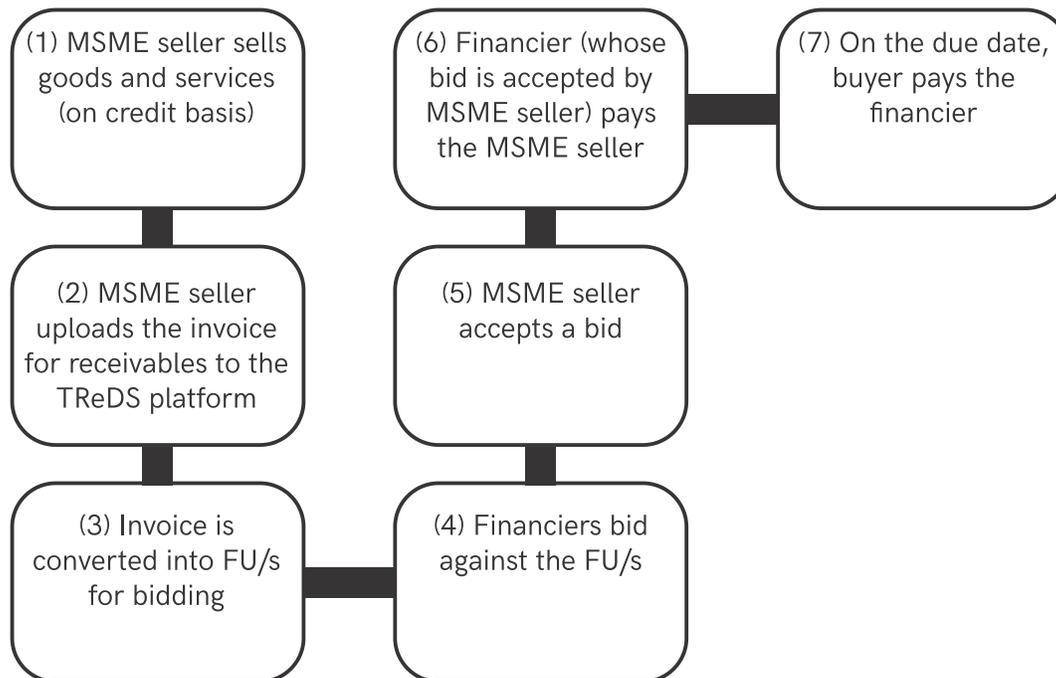


Figure 1: Steps involved in the Functioning of TReDS

The distinctive aspect of this mechanism is that the MSME seller is not responsible for repaying the financier if the buyer defaults on payment to the financier at the end of the initially agreed credit period with the MSME seller. This is because, the transactions carried out within the TReDS framework are structured as “without recourse” to the MSMEs. This feature sets it apart from the typical system of “bill discounting,” where the responsibility lies with the “drawer” (i.e., MSME seller) if the drawee (i.e., buyer) fails to make the payment (to the bank).

To further empower MSMEs, the Department of MSMEs of GOI issued a notification on November 2, 2018, instructing all companies registered under the Companies Act with an annual turnover of ₹ 500 crores, and all CPSUs to onboard a TReDS platform. This initiative provides significant support to MSMEs that provide (part or all of) their goods and services to these enterprises on credit basis.

Data Analysis and Interpretation

A few statistics presented below (Table 2) provide an idea about the performance of the system and its progress over the years. They also enable us to obtain a clear idea about the performance of TReDS and track its progress from the perspective of all six different parameters.

Table 2: Progress in MSME Financing through TReDS

Year and Other Details	Number of Invoices (i.e., Trade Receivables) ...		%age of Invoices Financed to Uploaded	Amount (₹ crores) of Invoices ...		%age of Amount of Invoices Financed to Uploaded
	Uploaded	Financed		Uploaded	Financed	
2017-18	22,704	19,890	87.61	1,095	815	74.40
2018-19	2,51,695	2,32,098	92.21	6,699	5,854	87.39
2019-20	5,30,077	4,77,969	90.17	13,088	11,165	85.31
2020-21	8,61,560	7,86,555	91.29	19,669	17,080	86.84
2021-22	17,33,553	16,40,824	94.65	44,111	40,308	91.38
2022-23	27,24,872	25,58,531	93.90	83,955	76,645	91.29
Total/Average	61,24,461	57,15,867	93.33	1,68,617	1,51,867	90.07
Mean	10,20,744	9,52,645	93.33	28,103	25,311	90.07
Skewness	1.04	1.05	-0.52	1.43	1.44	-1.62
CAGR (%)	122.10	124.68	1.16	106.12	113.27	3.47
t_{cal}	2.4364	2.4082	87.3514	2.2080	2.1634	33.8117

Source: Compiled the table based on the data collected from the reports of Reserve Bank of India (2023) and calculation made using these details.

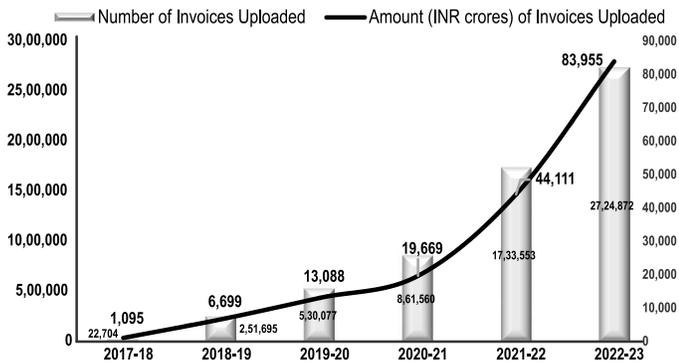
Based on the presented statistics, it is evident that the performance of the TReDS system has been satisfactory, showing a consistent improvement across all evaluated parameters. While the table provides a clear overview, a more detailed analysis is elaborated below under specific headings to offer further insights.

Number and Monetary Value of Uploaded Invoices

During the initial year of the study period, only 22,704 invoices amounting to ₹ 1,095 crores were uploaded. Subsequently, over the following five years, both the quantity and value of invoices uploaded displayed a consistent upward trajectory. Specifically, during the last year of the study period, 2022-23, the number of invoices uploaded surged to 27,24,872, with a corresponding value of ₹ 83,955 crores. On average, this

translates to 10,20,744 invoices and ₹ 28,103 crore per annum. During these six years, the MSME sellers uploaded 61,24,461 invoices involving ₹ 1,68,617 crores which works out to ₹ 2,75,317 per invoice uploaded (Figure 2).

Figure 2: Invoices Uploaded - Number and Monetary Value



Furthermore, it is noteworthy that the skewness values for both the number of invoices uploaded and their amounts are positive, standing at 1.04 and 1.43, respectively. This positive skewness suggests that the distribution of these figures skewed towards higher values throughout the six years, indicative of a positive trend in both quantity and value. Additionally, the compound annual growth rates (CAGRs) are positive, with higher levels of 122.10% for the number of invoices uploaded and 106.12% for the monetary value of invoices uploaded. These developments reflect a strong upward trajectory in the adoption of the TReDS platform by MSMEs.

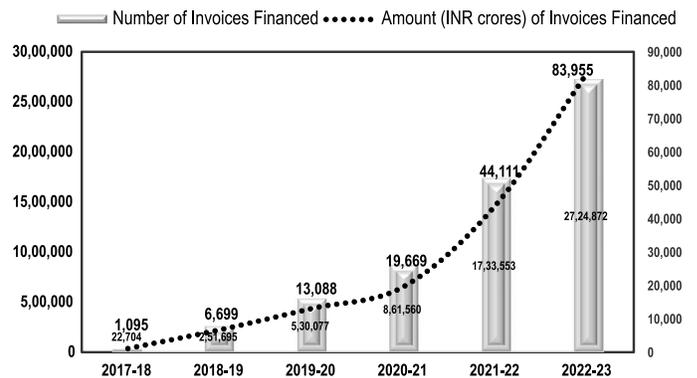
Number and Monetary Value of Financed Invoices

From Table 2, it is evident that both the number and value of financed invoices showed a continuous increase over the six-year period. In the initial year, there were 19,890 invoices financed amounting to ₹ 815 crores, which grew to 25,58,531 invoices totaling ₹ 76,645 crores by 2022-23. Throughout this period, TReDS facilitated the financing of 57,15,867 out of 61,24,461 uploaded invoices, representing 93.33% of invoices financed with a CAGR of 124.68%. Notably, the percentage of invoices financed compared to those

uploaded remained consistently above 87%, reaching a peak of 94.65% in 2021-22, before experiencing a slight decline to 93.90% in 2022-23.

Similarly, TReDS has facilitated the financing of ₹ 1,51,867 crores worth of invoices out of ₹ 1,68,617 crores worth of invoices uploaded, resulting in the financing of 90.07% of the value of invoices uploaded with a CAGR of 113.27%. This demonstrates a robust upward trend in the percentage of adoption and financing of MSMEs through TReDS (Figure 3).

Figure 3: Invoices Financed - Number and Monetary Value



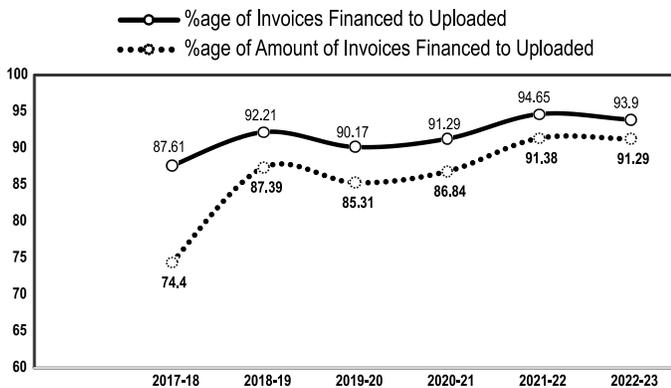
Additionally, positive skewness values of 1.05 and 1.44 are observed in both the quantity and monetary value of financed invoices, indicating a trend towards higher values over the study period. This skewness suggests an increase in invoice amounts, especially in recent years. Furthermore, the positive CAGRs of 124.68% and 113.27% highlight strong growth trends year over year. These metrics emphasize the continual enhancement in the operational efficiency of TReDS, thereby addressing the financial challenges encountered by MSMEs.

The Dark Side of Invoice Financing

Nevertheless, despite witnessing improvements in both the percentage of invoices financed relative to those uploaded and the percentage of invoice value financed relative to the uploaded value, these ratios experienced a decline during two years compared to their respective preceding periods. The COVID-19

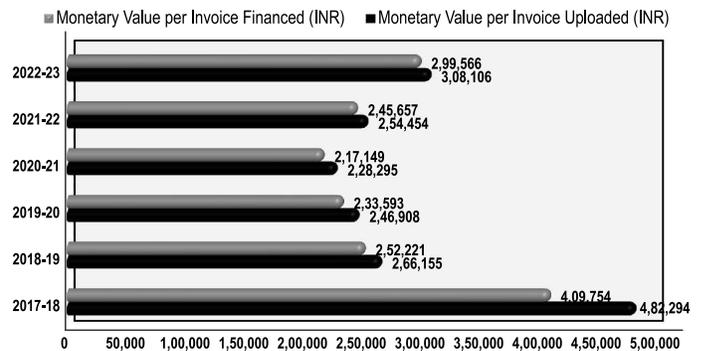
pandemic likely affected MSMEs’ sales and their ability to upload and finance invoices on TReDS. Additionally, the pandemic’s economic disruptions may have caused delays in payments, liquidity challenges, and operational hurdles in financing, impacting the business of both MSMEs and corporate buyers. Furthermore, the percentage of the value/amount of invoices financed is lower for all six years than the percentage of the number of invoices financed (Figure 4). This issue needs to be addressed to determine whether it was due to a higher discount rate or discounting a large number of invoices with comparatively lower amounts. If the lower percentage was due to a higher discount rate, the MSME sellers would be at a disadvantage, potentially undermining the core purpose of TReDS to some extent.

Figure 4: %age of Invoices Financed to Uploaded and %age of Amount of Invoices Financed to Uploaded



Furthermore, the value per invoice uploaded declined for majority of the years in earlier periods but showed improvement in the last two years. However, the value per invoice uploaded during 2022-23 is significantly lower (at ₹ 3,08,106) than in the first year, 2017-18 (of ₹ 4,82,294). This decrease could be attributed to the uploading of more trade receivables with lower amounts. A similar trend is observed in the amount financed per invoice, as depicted in Figure 5.

Figure 5: Monetary Value per Invoice Uploaded and Financed



Furthermore, the negative skewness in the percentage of amounts financed to uploaded (-1.62) indicates that the majority of observations cluster above the mean, showing less variability in performance. The impact of the pandemic on MSMEs’ capacity to upload and finance invoices on TReDS during 2019-20 and 2020-21 is apparent in the relatively lower growth in both the number of invoices and the financed percentage. The economic disruptions caused by the pandemic may have led to payment delays due to supply chain interruptions and operational hurdles faced by MSMEs in 2020-21, potentially reducing their ability to partake in revenue-generating activities and consistently engage with TReDS.

Despite a marginal decline in performance over the past one or two years, the significance of the TReDS platform remains undeniable. It continues to attract an increasing number of MSMEs, providing a crucial mechanism to effectively alleviate their financial challenges.

Hypothesis Testing and Statistical Analysis

Based on the performance statistics (Table 2), the null hypothesis, H_0 : *There is no significant improvement in the operational performance of TReDS*, was tested using a one-sample *t*-test. The findings are summarized in Table 2 above. At a 5% significance

level with 5 degrees of freedom, the critical value of t (t_{tab}) is 2.015. Upon examining the calculated values of t (t_{cal} , presented in Table 2), it is evident that the calculated t -values exceed the critical value for each of the six parameters used to assess TReDS' operational performance. Specifically, the t -values for the number of invoices uploaded and financed are 2.4364 and 2.4082 respectively; for the monetary values of invoices uploaded and financed, the t -values are 2.2080 and 2.1634; and for the percentages of number and monetary values of invoices financed to uploaded, the t -values are 87.3514 and 33.8117 respectively. These values being significant (exceeding the t_{tab}) demonstrate a high level of confidence in the observed trends. For example, in the case of the "number of invoices uploaded", t_{cal} is 2.4364, surpassing the t_{tab} of 2.015. Furthermore, the corresponding p -values (alpha values) for all six parameters are less than 0.05. Therefore, based on the assessment of TReDS performance across each parameter, the null hypothesis is tested and rejected in favor of the alternative hypothesis. This suggests a significant improvement across all six performance indicators analyzed, with this improvement being statistically significant.

Conclusion

TReDS is an online platform that enables MSME sellers to auction their trade receivables, providing them with immediate payments (on a "T+2" basis, where "T" is the date of bid acceptance, i.e., within 48 hours from the date of bid acceptance by the MSME seller) for their invoices, eliminating the need to wait until the end of the credit period and avoiding the hassle of following up with buyers for payment. This system helps MSMEs address their financial challenges by supporting their working capital needs, thus reducing the negative impact of selling on credit, such as increased finance costs due to delayed payments from corporate customers. It operates in a transparent, paperless, and convenient manner, offering competitive price discovery without recourse to MSME sellers, who have the autonomy to select the best bid.

The TReDS system also benefits financiers such as banking companies, NBFCs, etc., as they gain new business opportunities and expand their credit supply to MSME sellers/ suppliers.

Of course, there is an apprehension among corporate buyers about the MSME sellers' identities - some large businesses (which procure a part of their requirements from MSMEs) are hesitant to submit their bids (for the invoices online) for fear that their competitors may know their MSME suppliers. The apex bank (RBI) and the GOI may think about this apprehension and take appropriate measures to ensure the confidentiality of MSME sellers.

The scheme is a significant support for MSMEs, enabling them to access immediate liquidity from their trade receivables, which is crucial for timely realization of amounts and avoiding bad debts. TReDS has made notable progress in alleviating the financial challenges faced by MSMEs, evident in the substantial growth in both the number of invoices and the financed amounts. Any minor declines observed in certain years can be attributed to external factors such as the COVID-19 pandemic and supply chain disruptions. Nevertheless, the overall trend indicates a rising adoption and reliance on TReDS, highlighting its increasing importance as a catalyst for MSME financing. Continuous enhancements in financing efficiency and ongoing backing from financial institutions could ensure that TReDS maintains its positive trajectory and effectively addresses the liquidity constraints of MSMEs.

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Comparative Analysis of Asset-Liability Management: A Study of ICICI Bank and HDFC Bank

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Abstract

This study presents a comparative analysis of Asset Liability Management (ALM) practices at two major Indian banks, HDFC Bank and ICICI Bank, to understand their approaches to balancing assets and liabilities while managing associated financial risks. ALM is a vital process for banks, as it helps mitigate liquidity risks, interest rate fluctuations, and market volatility, ensuring financial stability and profitability. The research investigates the strategies adopted by both banks to manage these risks, focusing on their use of tools such as gap analysis, duration matching, and stress testing. Additionally, the study explores the role of financial instruments like derivatives in the ALM frameworks of both banks. By comparing HDFC Bank's and ICICI Bank's ALM practices, the study highlights key differences and similarities in their risk management strategies, regulatory compliance, and their ability to maintain liquidity while achieving sustainable growth. The findings provide valuable insights into the strengths and weaknesses of each bank's ALM strategy, contributing to a broader understanding of effective financial management in the Indian banking sector.

Keywords: *Asset Liability Management, risk management, liquidity, interest rate risk, financial stability, regulatory compliance.*

Overview

HDFC Bank Limited (HDFC Bank) stands as a pillar of the Indian banking sector, establishing itself as a premier private sector bank in the country. The foundation of HDFC Bank traces back to January 1995, when it was launched by Housing Development Finance Corporation (HDFC) Limited, a leading institution in the field of housing finance. Since its inception, HDFC Bank has consistently grown and evolved, becoming one of India's most esteemed and reliable banks. As of April 1, 2024, the bank's total assets amount to an impressive ₹ 36.17 lakh crore, highlighting its significant growth and pivotal role in the financial industry.

ICICI Bank is one of India's largest private sector banks, known for offering a wide range of banking products and services to individuals, businesses, and corporations. Established in 1994, it has grown to become a major player in the Indian banking sector with a significant presence in retail banking, corporate banking, and wealth management. ICICI Bank provides services such as savings and current accounts, loans, insurance, investment products, and online banking. The bank is recognized for its innovative use of technology and digital banking solutions, making banking more accessible and efficient for customers. It has a strong global presence, with branches and subsidiaries in several countries. ICICI Bank is also known for its robust risk management strategies and a focus on maintaining financial stability and growth.

Literature Review

Financial Performance

Krishnan, A. (2024) in the article "Asset-Liability Management Practices in HDFC Bank: An Analytical Study" (Source: International Journal of Banking and Finance Studies) provided an in-depth analysis of HDFC Bank's Asset-Liability Management (ALM) practices, focusing on liquidity and interest rate risk management over a decade (2007-08 to 2016-17). The research highlights the effectiveness of HDFC Bank's ALM strategies in managing financial risks and optimizing returns. The study employs secondary data from RBI guidelines and financial reports to assess the bank's maturity gap and liquidity risk management.

Verma, S. (2021) "Digital Banking and Customer Satisfaction: A Comparative Study of HDFC Bank and ICICI Bank" in the Journal International Journal of Digital Banking, Verma compares the digital banking services of HDFC Bank with those of ICICI Bank. The research highlights that HDFC Bank's advanced digital platforms, including mobile and internet banking, provide a seamless and user-friendly experience. The bank's continuous investment in technology and innovation ensures superior customer satisfaction, setting it apart from its competitors.

Sharma(2019) in his article titled "Impact of Non-Performing Assets on Financial Performance of HDFC Bank" which was from the Journal of Banking and Finance, examines the impact of non-performing assets (NPAs) on the financial performance of HDFC Bank. Despite the presence of NPAs, the study finds that HDFC Bank's stringent credit appraisal processes and proactive measures in managing NPAs have minimized their adverse effects. The bank's continuous monitoring and recovery efforts ensure that NPAs remain within manageable limits, thereby preserving its overall financial performance.

Ravi Kumar, T. (2000) In his book "ALM: Structure of Balance Sheet, Risk Management, and ALCO in Banks", Ravi Kumar provides insights into the structure of the balance sheet of banks and an overview of risk management, including interest rate risk, exchange

risk, liquidity risk, and credit risk. The book discusses the practical aspects of setting up and managing the Asset Liability Management Committee (ALCO) in banks and includes numerous case studies with mathematical inputs to understand concepts such as interest rate sensitivity and Value at Risk (VaR). The literature review highlights that Asset Liability Management (ALM) is an integral part of modern banking, offering meaningful insights for effective implementation in the post-reform era. The book also discusses the scientific and systematic progress made by banks in implementing ALM, which has become vital in modern banking.

Kurana, S. K. (2000) presents in the book "ALM: Elementary Concepts and Risk Management in Indian Banking", the elementary concepts of Asset Liability Management (ALM) applicable at both the micro level (branch level) and macro level (bank as a whole). It provides a detailed overview of various risks, including credit risk, interest rate risk, liquidity risk, and currency risk, along with a critical understanding of the prudential norms issued by the Reserve Bank of India (RBI) regarding these risks. The book aids in understanding the conceptual and practical approach of ALM in the Indian banking scenario.

Objectives of the Study

The primary objectives of this study are:

- 1. To Evaluate Asset-Liability Management Practices:** To assess and compare the asset-liability management strategies of HDFC Bank and ICICI Bank, identifying best practices and key differences between the two banks.
- 2. To Analyse Financial Ratios and Trends:** To perform a detailed analysis of financial ratios and trends related to asset and liability management for both banks, and to understand their implications on financial stability and performance.
- 3. To Examine Risk Management Techniques:** To investigate the risk management techniques employed by HDFC Bank and ICICI Bank in managing interest rate risk, liquidity risk, and credit risk.

In order to study this topic two hypotheses are framed.

■ **Primary Hypothesis (H1):**

- **H1:** There are significant differences in the asset-liability management practices of HDFC Bank and ICICI Bank, leading to variations in their financial stability and performance.

■ **Secondary Hypothesis (H2):**

- **H2:** HDFC Bank's asset-liability management strategies result in a more favourable liquidity position compared to ICICI Bank.

Data Analysis

Table No. 1 HDFC vs ICICI Home Loans Comparison

Particulars	HDFC Bank	ICICI Bank
Interest Rate	8.70% - 9.70%	9.25% - 10.05%
Loan Tenure	Up to 30 Years	Up to 30 Years
Eligibility	Salaried/Self-Employed, Resident Indian NRI, 18-70 years.	Salaried/Self-Employed, Resident Indian/NRI, 20-65 years, minimum income requirements for metro and other cities
Maximum Loan Amount	□ 6-10 Cr	Up to □ 5 Cr
Processing Fees	□ 3000 + GST	0.5% - 2% of the loan amount + GST
Other Charges	Both banks offer various property types and additional services like balance transfer and overdraft facilities.	

Asset and Liability Management & Ratio Analysis

Table No 2. Financial Ratios Calculations of HDFC Bank

Ratio/Year	2024	2023	2022	2021	2020
Fixed Asset Ratio			0.29%	0.28%	0.29%
Proprietary Ratio	12.18%	11.37%	11.60%	11.65%	11.16%
Debt-to-Equity Ratio	4.20	7.11	7.62	7.57	7.96
Fixed Asset to Net Worth	0.32%	11.37%	7.62%	7.96%	2.59%
Net Profit Ratio	13.14%	16.69%	13.93%	10.54%	10.22%

Table No 3. Financial Ratios Calculations of ICICI Bank

Ratio/Year	2024	2023	2022	2021	2020
Fixed Asset Ratio	0.58%	0.61%	0.66%	0.72%	0.06%
Proprietary Ratio	12.74%	12.66%	12.08%	11.09	10.61%
Debt-to-Equity Ratio	6.55%	6.89%	7.28%	7.34%	8.42%
Fixed Asset to Net Worth	4.56%	4.87%	7.28%	7.34%	7.22%
Net Profit Ratio	19.54%	14.01%	-0.02%	-6.71%	-20.91%

Interpretation:

The analysis covers five key financial ratios for HDFC Bank and ICICI Bank over the past five years. These ratios provide insight into the banks' asset utilization, capital structure, profitability, and overall financial health.

1. Fixed Asset Ratio

- **HDFC Bank:** The fixed asset ratio remained relatively low and stable, ranging between 0.28% and 0.32%. This suggests a conservative investment in fixed assets compared to total assets.
- **ICICI Bank:** The fixed asset ratio slightly decreased from 0.72% in 2021 to 0.58% in 2024. This ratio was consistently higher than HDFC Bank's, indicating a relatively higher investment in fixed assets.

2. Proprietary Ratio

- **HDFC Bank:** The proprietary ratio showed a steady increase from 11.16% in 2020 to 12.18% in 2024, indicating a gradual strengthening of equity relative to total assets.
- **ICICI Bank:** The proprietary ratio improved from 10.61% in 2020 to 12.74% in 2024, reflecting a solid equity base and a healthy financial structure.

3. Debt-to-Equity Ratio

- **HDFC Bank:** This ratio significantly decreased from 7.96 in 2020 to 4.20 in 2024, indicating a substantial reduction in leverage and a more conservative approach to financing.
- **ICICI Bank:** The debt-to-equity ratio decreased from 8.42 in 2020 to 6.55 in 2024. Although still higher than HDFC Bank's, it shows a trend toward reduced leverage.

4. Fixed Asset to Net worth Ratio

- **HDFC Bank:** This ratio remained low and stable, indicating that a small proportion of shareholders' equity is tied up in fixed assets.
- **ICICI Bank:** The ratio decreased slightly from 7.22% in 2020 to 4.56% in 2024, suggesting efficient utilization of equity in fixed assets.

5. Net Profit Ratio

- **HDFC Bank:** The net profit ratio showed fluctuations but generally increased from 10.22% in 2020 to 13.14% in 2024, demonstrating improved profitability.
- **ICICI Bank:** The net profit ratio showed significant improvement, from negative values in 2019 and 2020 to 19.54% in 2023, indicating a strong recovery and profitability.

Both banks show positive trends in their financial ratios, reflecting improvements in profitability, asset management, and capital structure. HDFC Bank consistently maintained lower leverage and a conservative approach to fixed assets. In contrast, ICICI Bank exhibited higher fixed asset investment and leverage but showed remarkable improvements in profitability over the period analysed. Overall, both banks demonstrate solid financial health and effective management strategies, with HDFC Bank leaning towards conservative financial practices and ICICI Bank showing significant recovery and profitability growth.

ALM Strategies

Table No 4 .Gap Analysis of HDFC Bank

HDFC Bank		Figures are in Crore Rs			
Items/Years	2024	2023	2022	2021	2020
Total Assets	3,617,623.09	3,226,531.42	2,825,187.78	2,658,733.58	2,658,733.58
Total Liabilities	3,177,377.28	2,792,954.73	2,443,279.40	2,336,142.84	2,336,142.84
Shareholders' Equity	440,245.81	433,576.69	381,908.38	322,590.74	322,590.74
Current Assets	219,147.42	198,875.91	180,428.30	168,234.18	168,234.18
Current Liabilities	135,437.93	124,315.74	116,671.90	112,520.80	112,520.80
Loans and Advances	2,484,861.52	2,242,537.84	2,032,581.25	1,805,678.97	1,805,678.97
Investments	702,414.96	673,781.50	563,927.65	488,469.90	488,469.90
Short-term Assets	219,147.42	198,875.91	180,428.30	168,234.18	168,234.18
Deposits	2,379,786.28	2,248,452.28	2,035,961.70	1,806,089.05	1,806,089.05
Borrowings	662,153.08	474,919.22	353,849.30	326,049.50	326,049.50
Other Liabilities	135,437.93	124,315.74	116,671.90	112,520.80	112,520.80

Table No 5 Gap Analysis of ICICI Bank

ICICI Bank		Figures are in Crore Rs			
Items/Years	2024	2023	2022	2021	2020
Total Assets	1,871,514.58	1,799,134.97	1,623,321.58	1,501,269.40	1,501,269.40
Total Liabilities	1,633,115.26	1,456,029.43	1,367,287.53	1,349,679.45	1,349,679.45
Shareholders' Equity	238,399.32	343,105.54	256,034.05	151,589.95	151,589.95
Current Assets	139,925.01	133,425.83	119,745.62	108,567.12	108,567.12
Current Liabilities	95,322.73	96,275.91	87,435.52	81,123.47	81,123.47
Loans and Advances	1,184,406.39	1,155,891.80	1,061,592.91	1,061,938.00	1,061,938.00
Investments	461,942.27	442,306.67	381,117.59	345,482.18	345,482.18
Short-term Assets	139,925.01	133,425.83	119,745.62	108,567.12	108,567.12
Deposits	1,412,824.95	1,250,227.45	1,191,803.40	1,129,275.00	1,129,275.00
Borrowings	124,967.58	135,668.48	120,905.43	112,754.80	112,754.80
Other Liabilities	95,322.73	96,275.91	87,435.52	81,123.47	81,123.47

Table No 6. Gap Analysis Calculations of HDFC Bank

Interest Rate Sensitive Assets (RSA) and Interest Rate Sensitive Liabilities (RSL) are estimated based on the given data.

Years	Rate-Sensitive Assets (RSA)(Rs.Cr.)	Rate-Sensitive Liabilities (RSL)(Rs.Cr)	Gap = RSA -RSL (Rs. Cr.)	Gap Ratio
2024	3,406,423.90	3,177,377.28	229,046.62	1.072
2023	3,138,079.87	2,349,952.12	788,127.75	1.336
2022	3,115,195.25	2,847,687.24	267,508.01	1.094
2021	2,776,937.20	2,506,482.90	2,506,482.90	1.107
2020	2,462,383.05	2,244,659.35	217,723.70	1.097

Table No 7. Gap Analysis Calculations of ICICI Bank:

Years	Rate-Sensitive Assets (RSA)(Rs.Cr.)	Rate-Sensitive Liabilities (RSL)(Rs.Cr)	Gap = RSA -RSL (Rs. Cr.)	Gap Ratio
2024	1,983,412.63	1,768,004.94	215407.69	1.1218
2023	1,786,273.67	1,633,115.26	153,158.41	1.094
2022	1,731,624.30	1,482,171.84	249,452.46	1.168
2021	1,562,456.12	1,374,617.17	187,838.95	1.137
2020	1,451,677.49	1,213,506.93	238,170.56	1.196

Interpretation:

HDFC Bank: Consistently displays a positive gap ratio, suggesting that it has more interest rate-sensitive assets (RSAs) than interest rate-sensitive liabilities (RSLs). This indicates a greater potential for earnings if interest rates rise.

ICICI Bank: Also shows a positive gap but with a lower gap ratio compared to HDFC Bank. This means ICICI Bank has a smaller proportion of assets that are subject to re-pricing within a given period relative to its liabilities, leading to a more conservative approach.

Table No 8 Duration Analysis of HDFC Bank

Duration Analysis assesses the sensitivity of assets and liabilities to changes in interest rates.

HDFC Bank

Years	Duration of Assets	Duration of Liabilities
2024	9.42	10
2023	9.73	8.42
2022	11.03	11.65
2021	10.27	10.31
2020	9.25	9.6

Table No 9 Duration Analysis of ICICI Bank**ICICI Bank**

Years	Duration of Assets	Duration of Liabilities
2024	10	10.22
2023	9.93	11.27
2022	10.5	10.43
2021	10.08	10.38
2020	9.66	8.98

Interpretation:

HDFC Bank: Assets have a slightly higher duration compared to ICICI Bank, indicating greater sensitivity to interest rate changes. This can lead to higher returns when interest rates rise but also exposes the bank to greater risk if rates fall.

ICICI Bank: Exhibits a more balanced duration between its assets and liabilities, providing stability in fluctuating interest rate environments.

Table No 10 Liquidity Management of HDFC Bank

Years	Current Assets (Rs. Cr.)	Current Liabilities (Rs. Cr.)	Current Ratio
2024	2,19,147.42	1,35,437.93	1.62
2023	1,98,875.91	1,24,315.74	1.6
2022	1,80,428.30	1,16,671.90	1.54
2021	1,68,234.18	1,12,520.80	1.5
2020	1,68,234.18	1,12,520.80	1.5

Table No 11 Liquidity Management of ICICI Bank

Years	Current Assets (Rs. Cr.)	Current Liabilities (Rs. Cr.)	Current Ratio
2024	1,39,925.01	95,322.73	1.47
2023	1,33,425.83	96,275.91	1.38
2022	1,19,745.62	87,435.52	1.37
2021	1,08,567.12	81,123.47	1.34
2020	1,08,567.12	81,123.47	1.34

Interpretation:

HDFC Bank: Maintains robust liquidity with current ratios consistently above 1, indicating a strong ability to meet short-term obligations. HDFC Bank's higher current ratios compared to ICICI Bank indicate a stronger liquidity position.

ICICI Bank: Also maintains good liquidity with current ratios above 1 but slightly lower than HDFC Bank, still ensuring sufficient coverage of short-term liabilities with its short-term assets.

Table No 12 Capital Management of HDFC Bank

Capital management ensures that the bank maintains adequate capital to absorb potential losses. The capital ratio is calculated as:

$$\text{Capital Ratio} = (\text{Shareholders Equity}) / (\text{Total Assets}) \times 100$$

Years	Shareholders' Equity (Rs. Cr.)	Total Assets (Rs. Cr.)	Capital Ratio (%)
2024	4,40,245.81	36,17,623.09	12.18
2023	4,33,576.69	32,26,531.42	13.45
2022	3,81,908.38	28,25,187.78	13.52
2021	3,22,590.74	26,58,733.58	12.12
2020	3,22,590.74	26,58,733.58	12.12

Table No 13 Capital Management of ICICI Bank

Years	Shareholders' Equity (Rs. Cr.)	Total Assets (Rs. Cr.)	Capital Ratio (%)
2024	2,38,399.32	18,71,514.58	12.75
2023	3,43,105.54	17,99,134.97	19.08
2022	2,56,034.05	16,23,321.58	15.78
2021	1,51,589.95	15,01,269.40	10.1
2020	1,51,589.95	15,01,269.40	10.1

Interpretation:

HDFC Bank: Maintains strong capital ratios over the past five years, ensuring the ability to absorb potential losses and maintain solvency.

ICICI Bank: Displays slightly higher capital ratios compared to HDFC Bank, indicating a marginally

Both HDFC Bank and ICICI Bank have demonstrated effective financial management and stability over the past five years. Their asset-liability management strategies, including gap analysis, duration analysis, liquidity management, and capital management, indicate their ability to effectively manage financial risks. Key takeaways include:

Correlation -

Shareholders' Funds and Current Assets for HDFC Bank is $r = 0.96$

Data:

- Shareholders' Funds (x): [440,245.81, 280,199.01, 240,092.94, 203,720.83, 170,986.03]
- Current Assets (y): [418,947.62, 340,477.60, 238,094.76, 165,396.28, 140,549.80]

ICICI Bank- The correlation is $r = 0.97$

Data:

- Shareholders' Funds (x): [238,399.32, 200,715.38, 170,511.97, 147,509.19, 116,504.41]

Interpretation: Both banks exhibit a very strong positive correlation between shareholders' funds and current assets. This suggests that increases in shareholders' funds are closely associated with increases in current assets for both banks, with ICICI Bank having a marginally stronger correlation.

2. Debentures and Current Assets- the correlation for HDFC Bank is

Data:

- Debentures (x): [67,510.90, 56,759.85, 55,781.40, 54,952.70, 52,780.70]
- Current Assets (y): [418,947.62, 340,477.60, 238,094.76, 165,396.28, 140,549.80]

ICICI Bank- The correlation is

Data:

- Debentures (s): [118,798.40, 98,927.14, 74,349.28, 60,195.18, 47,831.92]
- Current Assets (y): [214,306.08, 192,638.76, 232,662.48, 206,539.47, 195,133.41]

Interpretation: For HDFC Bank, there is a strong positive correlation between debentures and current assets, indicating that as debentures increase, current assets also tend to increase. Conversely, ICICI Bank shows a weak negative correlation, suggesting little to no relationship between debentures and current assets.

Debentures and Current Assets:

- **HDFC Bank:** $r = 0.91$
- **ICICI Bank:** $r = 0.14$

Interpretation: For HDFC Bank, there is a strong positive correlation between debentures and current assets, indicating that as debentures increase, current assets also tend to increase. Conversely, ICICI Bank shows a weak negative correlation, suggesting little to no relationship between debentures and current assets.

HDFC Bank has a strong positive correlation between shareholders' funds and both fixed and current assets, as well as a strong positive correlation between debentures and current assets.

ICICI Bank also demonstrates strong positive correlations between shareholders' funds and both fixed and current assets but exhibits a weak negative correlation between debentures and current assets.

Conclusion

Based on the analysis of the provided ratios and ALM study:

- **HDFC Bank** shows a strong performance across all key financial ratios, indicating robust profitability, liquidity, solvency, and efficiency. The bank's larger asset base provides it with a competitive edge in managing its assets and liabilities effectively. HDFC Bank should continue its current strategies while focusing on cost management and digital expansion to sustain its market leadership.
- **ICICI Bank** also demonstrates solid financial health but lags behind HDFC Bank in several key areas. The bank's profitability and efficiency ratios suggest the need for improved asset utilization and cost management. ICICI Bank should focus on enhancing its digital capabilities and exploring new market opportunities to improve its overall financial performance and competitiveness.

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Analysis of The Aviation Sector in India and China: Corporate Restructuring and Financial Performance

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Abstract

This study examines the financial performance of airlines before and after restructuring by analyzing key financial distress factors and the influence of institutional frameworks in India and China. Indian airlines followed a market-driven restructuring approach wherein, ICRs crashed and quickly structured airlines (e.g. ICR of Air India dropped to -212.62 in 2021). Although Cathay Pacific Airlines and China Eastern Airlines experienced negative ICR for years, they went through restructuring gradually. Using logistic regression, the study evaluates the financial data from 2015 to 2023, focusing on Net Profit Margin (NPM), Debt-to-Equity Ratio (DER), and ICR (Interest Coverage Ratio) to determine the likelihood of restructuring. Results show that profitability NPM is a strong distress indicator, and indeed, companies with negative sustained NPM levels are more likely to restructure ($p = 0.019$). Yet, high-leveraged companies like IndiGo did not succumb to restructuring without intervention, even though debt levels (DER) alone did not lead to that. This study highlights India's market-driven restructuring approach, shaped by institutional frameworks, while China's financial resilience is reinforced through state intervention. It observes that India prioritizes policy-driven stability measures, whereas China emphasizes efficiency-based restructuring, providing insights for future financial restructuring models.

Keywords: *Restructuring, Aviation Sector, Financial distress, Institutional framework*

Introduction

Organizations in financially distressed positions can find stability through corporate restructuring activities especially in aviation sector because market conditions and operational problems create such distress (Agrawal, 2020). The aviation industry holds vital importance in economic development however airlines remain unstable because of their high operational expenses, fuel price volatility and regulatory requirements (Mahtani & Garg, 2023). Restructuring operations requires strategic interventions yet its success depends on institutional frameworks together with government policies according to Sudarsanam and Lai (2001). The different restructuring methods applied in India and China create grounds for an analytical comparison between these two nations.

The rapid market liberalization in India's aviation sector enabled substantial growth yet financial instability persists because of fuel price volatility and aggressive market competition together with inefficient organizational costs (Mahtani & Garg, 2023). The airline collapses of Kingfisher Airlines, Jet Airways, and Air Pegasus demonstrate that excessive debt and weak profitability create conditions for airline bankruptcy (Mahtani & Garg, 2018). The Chinese aviation industry follows state-supported financial backing combined with governmental mergers and market regulation although these measures raise questions about future efficiency and competitive strength (Zhao, 2023).

The research investigates the effect that Net Profit Margin (NPM), Debt-to-Equity Ratio (DER) and Interest Coverage Ratio (ICR) have on airline restructuring decisions. A logistic regression analysis determines if financial indicators prove effective in forecasting restructuring outcomes. The research analyzes different restructuring patterns through a study of institutional support systems between India and China. Indian airlines conduct restructuring only after their financial situation reaches an unimaginable point when they must undertake drastic changes to survive. Chinese airlines require extensive financial deterioration under state support before beginning their restructuring process (Divekar & Sukhari, 2021).

The study analyzes restructuring methods while examining economic results to understand how effective restructuring programs function in varying regulatory systems. Research findings will assist policy creators and business executives as well as financial market analysts in comprehending emerging market airline restructuring institutions (Mahtani & Garg, 2020).

Profile of the Sector

Two rapidly developing sectors in India and China are aviation due to rising air travel needs official policies and increased funding sources. These two nations represent major aviation markets globally but they maintain separate institutional systems that affect their corporate restructuring procedures.

i. Market Size

The Indian aviation sector shows remarkable growth since it crossed 100 million annual passengers making it rank among global aviation markets (Garg, 2021). The Chinese aviation sector continues to grow at an exponential rate and is forecasted to surpass one billion domestic passengers because of expanding urbanization rising household earnings and sustained economic development (Zhong et al., 2023).

The market volume of the global aviation sector rebounded in the wake of the COVID-19 pandemic as pent-up travel demand, government stimulus packages

and the strategies of airlines' restructuring contributed to the growth. Global passenger traffic stood at 88 percent of pre-pandemic levels in 2023, India's domestic air traffic spiked to pre-COVID levels the same year, as the booming rise of the middle class made for Travel demand along with policy aid. Recovery in domestic aviation in China was rapid on the back of government-supported airline consolidation and stimulus measures, recovering by 96 percent by mid-2023. The surge after this post-pandemic was a reminder that airline operation needs to have financial resilience and strategic restructuring to continue.

ii. Key Players and Business Strategies

IndiGo operates as India's biggest airline through its low-cost carrier approach by maximizing fleet efficiency while controlling costs for aggressive market development. (InterGlobe Aviation Ltd. (IndiGo)). (Annual Report 2015-2023)

Air India operates as a full-service carrier that provides both domestic and international connectivity with premium features. Following its privatization, Air India has focused on expanding its global network and enhancing operational efficiency under the Vihaan.AI transformation plan to regain market leadership. (Air India Ltd. - Annual Reports 2015-2023)

China Eastern Airlines (China) maintains its position as a state-owned carrier that uses government support and international partnerships to expand internationally. (China Eastern Airlines Corporation Ltd. Annual report 2015-2023.)

As an Asia-Pacific market leader, Cathay Pacific (Hong Kong) uses its Oneworld alliances' premium services and long-haul network to position itself as a full-service airline operating from Hong Kong (Mahtani & Garg, 2021; Tyagi, 2014).

iii. Revenue Trends & Growth Potential:

The Indian aviation sector demonstrated robust revenue growth during pre-COVID times because middle-class travelers increased their journeys while

the domestic transportation network expanded (Garg, 2021). The aviation market in China experienced growth due to extensive infrastructure developments which created a profitable sector that continues to expand (Garg 2021; Garg & Singh 2023).

Importance of the Study

The findings are important because they investigate key factors of financial distress that impact airline firms operating in India and China while these nations represent the world's fastest-growing aviation sectors. The research enhances academic knowledge regarding corporate restructuring through its analysis of different market conditions and their effects on financial performance (Mahtani & Garg, 2023; Zhao, 2023). The adoption of customized restructuring approaches demonstrates industry relevance because they focus on operational improvement within competitive and market-fluctuating conditions (Sudarsanam & Lai, 2001; Lee et al., 2018). The study reveals the financial distress root causes to regulatory bodies so they can create supportive frameworks for restructuring (Almeida & Philippon, 2007). Airline practitioners use research findings to establish transformative restructuring plans and investors benefit from data about risk protocols and investment approaches (Agrawal, 2020; Stehr, 2023).

The research establishes context by examining present-day industry pressures including COVID-19 recovery and escalating fuel costs and regulatory changes which stress the importance of adapting to these diverse market challenges (Broadstock et al., 2021; Shi et al., 2023). The research provides stakeholders with complete direction for managing aviation sector complexities.

Objectives of the Study

- I. To evaluate how key financial indicators, influence the likelihood of restructuring in airline companies.
- II. To analyze the Influence of Institutional Frameworks on Corporate Restructuring in the Indian and Chinese Aviation Sectors.

Scope of the Study

This analytical research compares financial distress factors and corporate restructuring processes in the aviation industries of India and China. It evaluates key financial performance indicators before and after restructuring, assessing the impact of institutional frameworks on these transformations. By utilizing annual reports and relevant financial news sources, the study investigates the unique challenges airlines in both countries face, particularly in response to economic disruptions.

Limitations of the Study

The study encounters limitations because researchers struggle to acquire complete financial data from small industry participants thus affecting the analysis's comprehensive nature (Agrawal, 2020). Using published reports and historical datasets as secondary data sources introduces the bias problems that naturally exist in these types of data (Lee et al., 2018). The study suffers from a basic weakness because it lacks industry expert insights from interviews which restricts its capacity to thoroughly understand how restructuring effectiveness factors operate (Sudarsanam & Lai, 2001).

The analysis does not consider the challenges affecting smaller airlines within the market framework despite their importance as identified by Shi et al. (2023). The data collection includes several limitations regarding coverage since IndiGo provides data from 2014 to 2024 but Air India Cathay Pacific and China Eastern Airlines reports only extend to 2015 to 2023 because their 2024 reports were not made available by January 2025.

The different fiscal year endings create a limitation between India which ends on March 31 and China which ends on December 31. The difference in financial year periods between India and China produces potential difficulties when attempting cross-country data comparison.

Research aiming to expand knowledge about aviation sector financial dynamics should utilize various data

sources and multiple research methods that combine qualitative and quantitative approaches (Almeida & Philippon, 2007; Stehr, 2023).

Review of Literature

a. Financial Distress and Restructuring Drivers

Several scholars defined niche drivers of financial distress that specifically target the aviation industry while analyzing the special market dynamics of India and China. Mahtani and Garg (2023) enumerate that Indian airline companies experience financial issues because of variable fuel costs along with strict regulations and aggressive domestic competition. The combination of worldwide economic turbulences and the COVID-19 pandemic impacts airline finances markedly in China's airline market due to its rapid growth and current overcapacity syndrome according to Shi et al. (2023).

The financial weaknesses of Asia-Pacific airline companies stem largely from poor management practices together with operational inefficiencies according to Chang et al. (2022). The accelerated airline growth in China did not correspond with adaptive management systems so airlines needed financial restructuring to address the shortcomings. Lohrke et al. (2004) show through their research how poor management decisions serve as the main financial stress factors for Indian and Chinese airlines leading to changes in leadership requirements in both sectors.

b. Corporate Restructuring Strategies

Sudarsanam and Lai (2001) identified four types of restructuring approaches that financially unstable airlines should use including managerial restructuring operational restructuring asset restructuring and financial restructuring. Al-Hadi et al. (2017) demonstrated that executive changes throughout managerial restructuring represent a core strategy in India and China according to their research.

The Indian aviation sector adopted operational restructuring which focused on service optimization and cost reduction as Agrawal (2020) documents.

Chinese airlines have prioritized asset restructuring by enhancing their fleet and establishing international partnerships according to Zhao (2023) to improve their competitive market position.

c. Financial Performance Pre- and Post-Restructuring

Almeida and Philippon (2007) together with other researchers have intensely studied airline company financial results before and after restructuring efforts specifically focusing on the risk-adjusted financial distress costs within the aviation sector. The research conducted by Lee et al. (2018) establishes that airlines that successfully restructured their operations showed better profitability and reduced operational costs during the subsequent years after their restructuring initiatives.

Mahtani and Garg (2023) conducted a financial performance evaluation of Indian and Chinese airlines which showed diverging recovery results between the two markets after restructuring. Indian airlines demonstrated faster recovery through extensive operational reductions yet Chinese airlines achieved their financial growth through government backing and market stabilization initiatives.

d. Impact of External Factors on Restructuring Outcomes

Research shows that external influences like regulatory environments together with market conditions shape the restructuring results for airlines running in India and China. According to Broadstock et al. (2021), strong ESG (Environmental, Social, and Governance) frameworks support business resilience during crises thereby demonstrating that sustainability focus plays an essential role in financial distress mitigation.

Researchers agree that COVID-19 produced deep disruptions within both markets according to Stehr (2023). The travel restrictions imposed drastic changes upon Indian airlines and Chinese carriers needed to address international travel bans. External conditions significantly impact restructuring success according to Agrawal (2020) since Indian airlines experienced

fewer governmental restrictions than Chinese airlines did.

e. Comparative Studies between India and China

Research interest in the comparison of restructuring strategies between Indian and Chinese airlines has recently increased. The research conducted by Al-Hadi et al. (2017) demonstrates why knowledge of governance and operational approaches between nations impacts restructuring success. Both countries face similar industry problems yet their distinct market rules and business conditions produce different restructuring results.

Research demonstrates that corporate restructuring and financial performance in India and China's aviation sectors depend on managerial choices along with external market factors which produce diverse effects. To create suitable restructuring solutions for airlines operating in fast-changing markets it is essential to grasp their specific market dynamics.

f. Financial Drivers of Corporate Restructuring

Financial problems serve as the main reason that forces companies to restructure. Azhagaiah and Kumar (2020) studied Indian manufacturing firms to determine that high debt levels together with declining profitability and liquidity issues force firms to restructure. According to Mishra and Singh (2023), the cost analysis of restructuring depends on precise financial predictions for restructuring expenses.

According to Li and Wang (2023), better liquidity management combined with reduced debt ratios enables companies to achieve more efficient post-restructuring outcomes. According to Wilfinger (2023), European insolvency laws determine financial stability levels because legal structures determine how well financially troubled companies succeed in restructuring.

Business organizations choose multiple restructuring approaches that involve uniting with other firms or selling business units while reworking their financial agreements. Comin (2023) studied debt restructuring

techniques which demonstrate that businesses use creditor renegotiation to prevent bankruptcy and retain operational continuity. The research by Harmon and Robles-Garcia (2022) showed how economic forces create recurring patterns during corporate debt restructuring procedures.

The research from Wyman (2023) and Williams and Taylor (2023) showed that corporate restructuring activities become more difficult in rising interest rate periods which pushes organizations to focus on asset disposal and cost reduction. Kumar and Sharma (2024) stated that successful financial recovery demands restructuring strategies that must support long-term business objectives for sustainability.

g. Industry-Specific Trends in Restructuring

Sectoral differences influence restructuring approaches. The company McKinsey & Company (2023) researched capital-intensive industries to demonstrate how liquidity management ensures business survival during restructurings. Mukherjee and Banerjee (2023) researched manufacturing sector restructuring across the US, UK, and EU to show that pre-restructuring companies with higher utilization rates achieved better recovery results.

Ghosh and Dutta (2024) studied the application of demerger corporate restructuring in Indian airlines as part of their research within the aviation industry.

h. Legal and Regulatory Perspectives

A restructuring process takes its direction from legal frameworks which determine its outcome. Tjurina and Krueger (2022) investigated European restructuring laws by analyzing the available alternatives that help businesses avoid liquidation during distress. Smith and Brown (2022) investigated how international investment protections affect corporate restructuring through their research on cross-border restructuring decisions.

The authors Mahmoud, Fennessy, and Perlman (2023) reviewed the differences in restructuring patterns between North American and European markets while

examining respective bankruptcy laws and state interventions. The research from PwC (2024) and Crinson et al. (2024) indicates corporate bankruptcies will increase because of economic uncertainties and higher interest rates that require businesses to adopt proactive restructuring approaches.

Research Methodology

This is an analytical research where we compare and analyze critical financial distress factors of companies through corporate restructuring methods. The study includes commercial airlines from India and China for comparison since their different institutional structures could impact both their corporate restructuring methods and financial results. The data is collected only from the companies’ official annual reports and relevant news articles. The study performed quantitative measurements to analyze financial outcomes between the pre-restructuring period and the post-restructuring period from 2015 to 2023.

Logistic Model Regression

$$P = \frac{e^{(\beta_0 + \beta_1x_1 + \beta_2x_2 + \dots + \beta_nx_n)}}{1 + e^{(\beta_0 + \beta_1x_1 + \beta_2x_2 + \dots + \beta_nx_n)}}$$

This model is used because, in binary classification problems the dependent variable is categorical (0 or 1).

Logistic Regression Model for Restructuring Prediction

The probability of restructuring P(Y=1)) is modeled as:

$$P(\text{Restructure}_{it}=1) = \frac{e^{(\beta_0 + \beta_1NPM_{it} + \beta_2DER_{it} + \beta_3ICR_{it})}}{1 + e^{(\beta_0 + \beta_1NPM_{it} + \beta_2DER_{it} + \beta_3ICR_{it})}}$$

Where,

P (Restructure_{it} = 1) = Probability that a company undergoes restructuring.

β₀ (Intercept) = Baseline log-odds of restructuring when all independent variables (NPM, DER, ICR) are zero.

β₁ (NPM Effect) = Change in log-odds of restructuring for a one-unit increase in Net Profit Margin.

β₂ (DER Effect) = Change in log-odds of restructuring for a one-unit increase in Debt-to-Equity Ratio.

β₃ (ICR Effect) = Change in log-odds of restructuring for a one-unit increase in Interest Coverage Ratio.

The researcher obtained secondary data from annual reports of IndiGo and Air India together with China Eastern Airlines and Cathay Pacific. The research evaluated secondary data spanning 2015 to 2023 that the researcher obtained from annual reports.

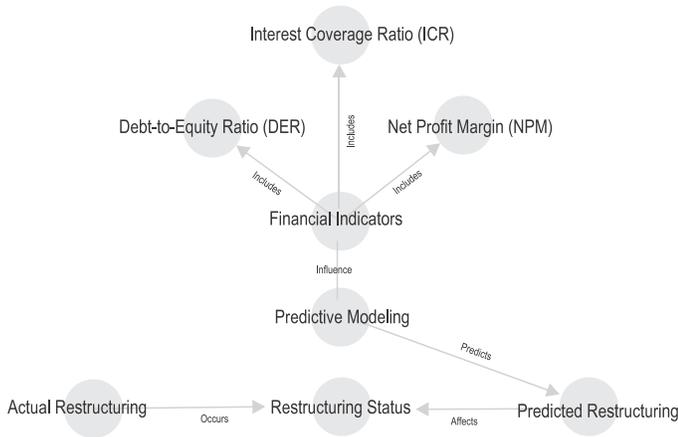
The research analyzes financial distress factors through Financial Ratio Analysis by evaluating profitability measures and liquidity metrics and solvency indicators while including NPM and DER and ICR. Financial distress evaluation included quantitative assessments of financial data to determine institutional structures’ effect on restructuring results.

The Excel program performs all financial analysis tasks including trend assessments and calculation activities. Logistic regression modeling is used for econometric analysis to discover which corporate restructuring decision factors stand out as the most important elements.

Air India and IndiGo together with Cathay Pacific Airlines (CPA) and China Eastern Airlines (CEA) form the four publicly listed airline subjects which researchers chose due to their financial reporting transparency and extensive international routes and corporate restructuring histories. The airlines present qualified case research that shows financial instability alongside restructuring results.

Air India maintains a flight network of 44 international routes together with 46 domestic destinations. IndiGo Serves 80 plus international destinations. Cathay Pacific Airlines covers 200 worldwide destinations. China Eastern Airlines operates 49 domestic and 71 international destinations across 34 countries.

Conceptual Framework



Financial Indicators

The assessment of corporate financial health requires using financial indicators which represent essential financial metrics. Financial indicators provide crucial information about the company’s financial standing regarding both profitability and debt management and liquidity levels. The restructuring process receives influence from three primary financial metrics: Debt-to-Equity Ratio (DER) and Net Profit Margin (NPM) and Interest Coverage Ratio (ICR).

The Debt-to-Equity Ratio (DER)

It evaluates how much debt (total debt) stands against shareholder equity within an organization. Financial distress risks increase when debt-to-equity ratios reach high levels because such conditions could necessitate organizational restructuring. The ratio stands as an essential factor that pushes businesses towards restructuring because it affects their financial health.

Net Profit Margin (NPM)

It demonstrates the revenue portion which exists as profit after subtracting all business expenditures by revealing the percentage value. A company demonstrates its profit conversion capability through this ratio. When the net profit margin falls or decreases companies should consider restructuring because poor financial performance becomes evident.

The Interest Coverage Ratio (ICR)

It evaluates how well a company pays its debt interest obligations by dividing EBIT by interest expenses. The ratio divides EBIT (Earnings Before Interest and Taxes) by the interest expense to determine it. A low Interest Coverage Ratio shows that a firm might face difficulties in paying interest expenses and this situation might require debt reduction through financial restructuring plans.

Predictive modeling

Through predictive modeling, companies utilize statistical approaches and machine learning algorithms to forecast forthcoming outcomes by examining past data. The analysis predicts company restructuring by evaluating financial performance indicators. The method analyzes financial variables to estimate future restructuring choices through its analysis of statistical relationships.

Actual Restructuring

When a company reorganizes its operations finances and legal structure it conducts actual restructuring in response to financial distress and efficiency needs. The company implements debt restructuring as well as replaces management teams and sells assets to reorganize its operations. The event’s actual occurrence depends on both internal decisions made by the company and external influences that affect its financial health.

Predicted Restructuring

The likelihood of corporate restructuring that predictive models calculate by analyzing financial indicators constitutes predicted restructuring. Management uses this prediction to prepare in advance for upcoming restructuring either through prevention or corrective measures.

Restructuring Status

Company restructuring success status reveals if an organization successfully implemented organizational realignment. The outcome reveals if the actual

restructuring occurred successfully or if financial distress persists in the company. The restructuring status acts as an essential evaluation parameter to measure the success of restructuring projects both for predicted and implemented restructuring initiatives.

Data Analysis

The data preprocessing was done before conducting statistical tests and implementing the model to evaluate financial indicator associations with restructuring actions.

A. Model Implementation

The study needed logistic regression since its main purpose is to predict binary outcomes regarding restructuring decisions. The dataset benefits most from logistic regression since it uses financial distress indicators to calculate restructuring probabilities through non-linear effect analysis.

The Python Stats models library enabled the execution of logistic regression. The model generates odds ratios from its calculations to demonstrate how financial distress indicators affect the possibility of organizational restructuring.

Table 1- Logistic Regression results

Statistics	Value	Statistic	Value
Dep. Variable	Restructured	Pseudo R-Squ.	0.4936
No. Observations	36	Time	12:50:40
Model	Logit	Log-Like lihood	-12.182
Df Residuals	32	Converged	TRUE
Method	MLE	LL-Null	-24.057
Df Model	3	Covariance Type	Non-robust
		LLR p-value	2.82E-05

	z	P> z	[0.025	0.975]
constant	-0.95	0.342	-1.508	0.523
Net Profit Margin	-2.348	0.019	-0.338	-0.03
Debt-to-equity ratio	-0.297	0.767	-0.03	0.022
Interest coverage ratio	-0.386	0.699	-0.164	0.11

Probability transformation after substituting the coefficients in the logistic regression model,

$$P(\text{Restructure it} = 1) = \frac{e^{(-0.4923 - 0.1840 \cdot NPM_{it} - 0.0039 \cdot DET_{it} - 0.272 \cdot ICR_{it})}}{1 + e^{(-0.4923 - 0.1840 \cdot NPM_{it} - 0.0039 \cdot DET_{it} - 0.272 \cdot ICR_{it})}}$$

The Pseudo R-squared (0.4936) indicates that the independent variables account for about 49.36 % of the variation in the dependent variable (Restructured). Overall, the model is statistically significant, according to the LLR p-value (2.816e-05) which is a very small number.

The coefficient of NPM (-0.1840) is negative and it is statistically significant (p = 0.019). That implies that higher profitability decreases the probability of restructuring. Its coefficient (0.039) has a small positive but insignificant (p = 0.767) value, indicating that the effect of DER on restructuring is statistically insignificant. The restructuring does not have a significant relationship with ICR (Interest Coverage Ratio) as it has a negative coefficient (-0.0271) but is not significant (p = 0.699).

Using Logistic Regression, it was found that a higher Debt to debt-equity ratio (DER) positively correlates with a greater probability of restructuring, and a lower Net Profit Margin (NPM), as well as Interest Coverage Ratio (ICR), correlates with a higher probability of restructuring. When it comes to financial recovery, restructuring a company with an excessive debt burden and falling profitability is inevitable.

The Pseudo R-squared from the logistic regression model equals 0.4936 reflecting that the independent financial distress indicators could account for almost

50% of the variation in restructuring outcome. By using financial models one can effectively quantify the likelihood of restructuring and companies can use predictive analytics for early decision making.

The logistic regression model obtained an 88.89% classification accuracy, 100% precision in the detection of restructuring cases, and an F1 score of 0.83 for restructured companies. As a tool for early intervention and decision-making, the model is highly reliable in forecasting financial distress as well as restructuring.

The pseudo-R² value of 0.4936 indicates that the observed restructuring decisions were explained by the selected financial ratios to the extent of 49%. Financial indicators are one of the major factors in restructuring decisions, however, there are external factors that marshal outcomes: government interventions, industry regulations, and strategic management decisions.

The log-likelihood ratio test ($p = 2.816e-05$) indicates that the model is statistically significant in predicting restructuring outcomes. By minimizing random predictions, the model is robust and reliable in differentiating between companies that will restructure and those that will not.

The Confusion Matrix illustrates the results by showing how many correct and incorrect predictions there are among true positives and false positives and true negatives and false negatives. The Classification Report contains precision-recall alongside an F1-score to evaluate the model's capability for restructuring prediction.

Table 2- Classification of results

Class	Preci- sion	Recall	F1- Score	Sup- port
0 (Not Restructured)	0.85	1	0.92	22
1 (Restructured)	1	0.71	0.83	14
Accuracy			0.89	36
Macro Avg	0.92	0.86	0.88	36
Weighted Avg	0.91	0.89	0.88	36

The classification model has an overall accuracy of 89%, indicating a high level of correctness in predicting restructuring outcomes. The macro average F1-score (0.88) and weighted average F1-score (0.88)

When we look from the perspective of class-wise evaluation, the model perfectly distinguishes Class 0 (Not Restructured) with a recall of 1.00 that is all actual non-restructured cases were correctly identified. However, for Class 1 (Restructured), recall drops to 0.71, which suggests that some restructured cases were misclassified as non-restructured.

Although the predictive model identified restructuring events for China Eastern Airlines and Cathay Pacific in 2020, Air India in 2022 and CPA in 2023 were misclassified because of external factors.

While predictive models are a very useful source of foresight, actual outcomes are altered by interventions such as government bailouts or management restructuring.

A. Comparative Analysis between India and China

Market-Driven Urgency vs. State-Backed Gradualism

a) India - Air India and IndiGo:

Table 3 - Ratios of AirIndia

AirIndia			
Ratios	NPM*	DER**	ICR***
2015	14.02	1.34	1136.15
2016	15.92	0.86	143.27
2017	5.35	0.9	188.93
2018	10.64	1.89	81.22
2019	9.02	1.36	30.05
2020	17.31	2.31	19.5
2021	-60.77	3.56	-212.62
2022	2.47	0.89	0.41
2023	8.4	1.54	5.25

Table -4 Ratios of Indigo Airlines

Indigo Airlines			
Ratios	NPM*	DER**	ICR***
2015	9.11	24.6	16.18
2016	11.92	6.1	10.25
2017	8.57	3.02	6.48
2018	9.36	1.99	8.7
2019	0.52	2.6	-0.4
2020	-0.67	6.17	2.15
2021	-37.19	605.05	-0.01
2022	-23.15	-8.6	0.22
2023	-0.57	-10.37	2.07

Table 5 - Ratios of Cathay Pacific Airlines

Cathay Pacific Airlines			
Ratios	NPM*	DER**	ICR***
2015	6.16	-2.6	-4.83
2016	-0.3	-2.2	0.34
2017	-0.91	-2.07	0.65
2018	2.5	-1.98	-1.46
2019	1.58	-2.42	-1.05
2020	-46.12	-1.79	5.96
2021	-12.12	-1.72	0.53
2022	-12.98	-1.84	-1.13
2023	10.36	-1.9	-3.82

Table 6 - Ratios of China Eastern Airlines

China Eastern Airlines			
Ratios	NPM*	DER**	ICR***
2015	5.37	3.96	-1.76
2016	5.01	3.05	-1.99
2017	6.65	2.91	-2.96
2018	2.54	2.88	-1.61
2019	2.88	3.07	-1.64
2020	-21.39	3.12	2.65
2021	-19.79	3.25	2.33
2022	-86.53	3.38	3.59
2023	-7.57	3.47	0.27

*Net Profit Margin ** Debt-to-equity ratio

*** Interest Coverage ratio

Indian companies restructure only after financial distress reaches a crisis level (e.g., Air India's ICR turned deeply negative in 2021). IndiGo, despite being financially stable earlier, saw a sharp drop in ICR in 2021, aligning with restructuring - suggesting that private firms act only when profitability is severely threatened. Since government intervention is minimal, restructuring is reactive and aimed at survival rather than long-term sustainability. Indian companies had delayed but necessary restructuring.

NPM predicts re-structuring with a negative relationship, the lower the NPM the higher the probability of the re-structuring. In this model, debt and interest coverage do not show strong evidence of influencing restructuring decisions. Several metrics evaluated the performance indicators. The Accuracy Score shows how right the predictions the model can produce.

A. China - China Eastern Airlines and Cathay Pacific Airlines

CEA and CPA had negative ICRs for years before restructuring—indicating that financial distress was tolerated for an extended period. Unlike Indian airlines, which faced crises, Chinese airlines operated under distress longer due to state backing. This suggests that government-supported firms delay restructuring, often prioritizing stability over profitability. These companies had a gradual but prolonged restructuring.

The financial condition of Indian firms experienced an intense downturn before restructuring initiatives which resulted in forceful recovery strategies.

Financial conditions of Chinese enterprises remain weak for extensive periods because government policies determine corporate restructuring decisions instead of urgent financial health. Chinese government support functions as a protective mechanism that stops immediate collapses yet Indian organizations only resort to restructuring after private sector failures.

D. Recovery Patterns and Policy Implications

The crisis-induced restructuring process in India results in rapid financial recovery because of its strategy focus on operational efficiency. The state-led nature of Chinese restructuring provides stability though it extends the duration when companies operate with inefficient practices. Policymakers who grasp these patterns can develop better restructuring strategies by synchronizing public help with financial responsibility.

Conclusion

This study examined the financial performance of airlines before and after restructuring, using key financial indicators such as Debt-to-Equity Ratio (DER), Net Profit Margin (NPM), and Interest Coverage Ratio (ICR). The logistic regression model demonstrated 88.89% classification accuracy, achieving 100% precision in detecting restructuring cases and an F1-score of 0.83, confirming the reliability of financial indicators in predicting distress. The pseudo-R² of 0.4936 represents that nearly half of the restructuring decisions were explained by financial ratios, and the log-likelihood test ($p = 2.816e-05$) confirms statistical significance.

It also examines the influence of institutional frameworks on corporate restructuring in India and China. IndiGo's debt-to-equity ratio increased to 605 in the pre-restructuring period, while the others have seen incremental leverage growth, which confirms its relationship with restructuring and financial distress. Restructuring timelines were significantly affected by government interventions, regulatory policies, and market conditions as in the case of Air India's extended restructuring beyond the model's predictions.

This research successfully realizes its objectives by combining financial and institutional analysis and provides insights into corporate restructuring in the aviation sector in different economic and regulatory environments.

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An Overview of The Impact of AI and Other Technologies on Banking Sector

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Abstract

Rapid technology improvements, shifting consumer needs, and regulatory changes are all transforming the banking sector. Important new trends that have the potential to alter the way financial services are provided, used thoroughly, and regulated are driving this change. Among these trends are the expansion of digital banking, the increasing power of crypto currencies and block chain technology, the incorporation of artificial intelligence (AI) into decision-making, the development of cyber security, the emergence of sustainable banking practices, and the broad use of open banking. In addition to improving financial services' effectiveness, accessibility, and security, these advances also bring new difficulties in data protection, fraud prevention, regulatory compliance, and ethical issues.

The research article examines these important developments in the banking industry, including how blockchain changes payment systems, how digital banking and artificial intelligence affect customer experience, the security risks associated with digital transformation, and the legal frameworks governing these emerging technologies. The study thoroughly explains the changing banking industry by examining the latest advancements and difficulties. It guides how financial institutions may protect customers and adhere to changing requirements while navigating innovation challenges.

Keywords: *Artificial Intelligence, Ai Tools, Banking, Chatbots*

Introduction

The banking sector, which has long been seen as a pillar of the world economy, is undergoing significant transformation. The banking industry, which has historically defined physical establishments and a paper-based methodology, has progressively used technology to satisfy the needs of a changing market. A new age in banking is fueled by digital innovation, regulatory changes, and evolving consumer expectations; this is sometimes called "the future of finance." Digital banking, blockchain technology and crypto currencies, artificial intelligence (AI), and cyber security are some of the most notable new technologies changing the banking industry.

One of the main forces behind this change is digital banking, which provides various financial services via mobile apps and web platforms. Remote banking service access has dramatically increased financial inclusion and gives customers more financial autonomy. Similarly, blockchain technology—the foundation of crypto currencies like Ethereum and Bitcoin—offers a transparent, safe, and decentralized method of managing transactions, which may eliminate the need for mediators and cut transaction costs.

Artificial intelligence completely changes the banking industry by automating repetitive processes, improving risk management, and providing clients with individualized banking experiences. The potential of AI to increase productivity and better decision-making is extensive, ranging from AI-driven chatbots that offer 24/7 customer support to predictive analytics that

assist banks in evaluating credit risk. However, as our reliance on digital technologies grows, so does the possibility of cyber-attacks. As a result, banks are now substantially investing in strong security systems to protect critical data and stop fraud, making cyber security a top priority.

Green banking is gaining popularity due to financial institutions implementing policies to support climate change mitigation initiatives in response to customer demand and international demands for sustainability. As the banking business is revolutionized, financial institutions must traverse a complicated network of national and international regulatory regimes meant to protect consumer interests, prevent financial crimes, and maintain data privacy. In particular, as the banking industry becomes more digitalized and integrated, regulations such as the General Data Protection Regulation (GDPR), Payment Services Directive 2 (PSD2), and anti-money laundering measures become increasingly important and significant.

The paper explores how regulators react to these advances and looks at the possible advantages and difficulties of digital banking, blockchain, artificial intelligence, cyber security, and sustainable finance. By thoroughly examining these patterns, the study seeks to shed light on how the banking industry may use technology to its advantage while maintaining the sustainability, equity, and safety of its operations.

The term "digital banking" describes how banking services have been fully digitalized and made available to consumers via online channels such as web portals and mobile applications. In many nations, digital banking is becoming the standard rather than the exception due to the proliferation of smartphones and better internet connectivity.

Among the notable developments are neobanks: Traditional banks are no longer the exclusive players in the market. These banks usually target younger, tech-savvy customers who want better user experiences, lower costs, and state-of-the-art digital tools. Payment Methods: One example of how

payments are changing is the incorporation of digital wallets such as Apple Pay, Google Pay, and Samsung Pay into the financial environment. These solutions reduce reliance on physical credit cards by enabling customers to safely make payments with their mobile devices.

Digital platforms are also generating new pathways for financial inclusion. BaaS platforms provide banking infrastructure for non-bank organizations to offer financial products.

Fintech companies and traditional financial institutions have joined together to offer integrated products, such as payment gateways and lending services. The main difficulty is controlling the dangers related to customer data protection, money laundering, and online fraud. Digital banking is increasingly being governed by laws like the General Data Protection Regulation (GDPR) in Europe and the Payment Card Industry Data Security Standard (PCI DSS). With more reliance on digital infrastructure, these regulatory bodies are focused on protecting customer data and ensuring that digital platforms follow stringent security standards. Effective regulation is even more important as digital banking expands. The main difficulty is controlling the dangers related to customer data protection, money laundering, and online fraud. In Europe, laws like the General Data Protection Regulation (GDPR) and the Payment Card Industry Data Security Standard (PCI DSS) are becoming more and more important for overseeing digital banking. These regulatory bodies are focusing on protecting customer data and making sure that digital platforms follow stringent security regulations as the use of digital infrastructure grows. Blockchain technology, which underpins cryptocurrencies, is beginning to have a big influence on the financial sector. It offers decentralized transaction recording, which reduces fraud, increases transparency, and lowers costs associated with traditional banking systems.

Although they are still erratic, financial markets have begun to use cryptocurrencies like Bitcoin, Ethereum, and Ripple. Traditional financial institutions like

JPMorgan Chase and Goldman Sachs have started to provide crypto-related services, from custodial services to cryptocurrency derivatives.. They are used in several industries, such as cross-border payments, lending, and insurance. Conventional international payments sometimes entail a number of middlemen, which raises expenses and causes delays. Financial institutions can expedite transactions with Ripple and related technologies by passing conventional financial middlemen and sending cross-border payments directly.

In the US, regulators such as the Commodity Futures Trading Commission (CFTC) and Securities and Exchange Commission (SEC) are attempting to establish precise guidelines for cryptocurrency activities. Additionally, in a decentralized system where identity verification becomes complicated, there is the problem of Know Your Customer (KYC) and Anti-Money Laundering (AML) compliance. Because cryptocurrencies sometimes operate internationally, regulators must cooperate to guarantee uniformity in enforcement and policy.

Artificial Intelligence in Banking

By automating repetitive processes and providing more individualized client care, artificial intelligence (AI) is completely changing the banking industry. Artificial intelligence (AI) tools including machine learning, natural language processing, and predictive analytics have greatly increased risk management, fraud detection, and banking efficiency.

Chatbots and virtual assistants driven by AI are revolutionizing banking customer service. AI is used by organizations like HDFC's EVA and Bank of America's Erica to offer real-time, round-the-clock customer service. Without human assistance, these AI systems can complete transactions, respond to frequently asked questions, and offer tailored financial advice. AI is also essential for risk assessment and management. Large volumes of data may be processed by it in order to identify fraudulent activity and forecast future financial disasters. AI systems, The Equal Credit

Opportunity Act (ECOA) and the Fair Lending Regulations of the United States are intended to prevent discriminatory lending practices. Data protection regulations like the GDPR are essential when AI systems access and analyze sensitive consumer data.

Cyber security and Data Protection

Banks are particularly vulnerable to cyberattacks since they depend more and more on digital channels to do business. Because it deals with sensitive data, the financial industry is a prime target for hackers who want to commit widespread fraud or steal personal data. Many banks have deployed MFA systems to provide safe login for their clients. MFA demands users to give two or more verification factors, such as a password and a biometric scan, making it difficult for unauthorized persons to get access.

Blockchain technology is also being used by financial organizations to protect data and transactions. Blockchain is a great tool for fighting cybercrime because of its immutable and decentralized structure, which makes it easy to identify and fix any fraudulent activity. AI is becoming increasingly crucial in cybersecurity because it allows institutions to recognize and respond to possible attacks in real time. AI systems can evaluate data trends and identify abnormalities that may suggest cyber dangers or data breaches. Regulators are increasingly becoming worried about cybersecurity and usage of a shared space on the internet. Laws such as the GDPR in the EU and the Cybersecurity Information Sharing Act (CISA) in the United States place pressure on banks to safeguard customer data and promptly report breaches. These Concerns have also been raised about third-party vulnerabilities, as banks increasingly had to rely on private contractors for cloud storage and data processing services. Regulatory frameworks such as the United States' NIST Cybersecurity Framework and the European Union's General Data Protection Regulation (GDPR) are critical on the matter of ensuring that financial institutions meet absolute cybersecurity rules and regulations.

Sustainable and Green Banking

Green finance is accelerating as climate change worries increase. The term “green banking” describes banking procedures that encourage investments and projects that are ecologically friendly. This might include funding renewable energy projects and issuing green bonds.

Banks offer green bonds, which are financial securities, to fund initiatives that benefit the environment or the climate. These consist of sustainable agriculture, energy-efficient structures, and renewable energy initiatives. Banks also take into account how their lending portfolios affect the environment. Many provide loans with favourable conditions to companies engaged in clean energy or environmental initiatives. Banks are progressively incorporating ESG criteria into their investing portfolios. This strategy emphasizes monetary gains as well as the effects that investments have on the environment and society. Green banking regulatory frameworks are currently developing. More detailed rules for a “green” investment are sought after in the EU via the Sustainable Finance Disclosure Regulation (SFDR) and the EU Taxonomy for Sustainable Activities. Banks are required to make sure that their green financial products adhere to these rules and give investors transparency. Concerns have also been raised concerning “greenwashing,” the practice of banks or businesses deceiving investors by claiming that their investments are sustainable.

Open Banking and API Integration

Open Banking is a system in which banks use Application Programming Interfaces (APIs) to share client data with third-party suppliers (with the approval of the customers). More competition and cutting-edge financial goods are made possible by this opening of the financial services industry.

External financial services can be more easily integrated into banking platforms thanks to open banking. This implies that clients can use a variety of services within their banking environment, such as alternative loan platforms and budgeting applications.

With fintech startups creating solutions that threaten conventional banking models, open banking has encouraged innovation. Payment initiation services, for instance, let users pay without a credit card by using their bank accounts. Because banks exchange sensitive consumer data with third-party suppliers, Open Banking implementation necessitates stringent adherence to data privacy rules. Clear rules governing these operations are ensured by the UK’s Open Banking Initiative and the EU’s PSD2 (Payment Services Directive-2). Ensuring that the safe implementation of open banking systems without jeopardizing consumer privacy or leaving them vulnerable to fraud is the problem at hand for regulators.

Conclusion

The banking industry and the financial sector are evolving at a rapid pace resulting in the rise of different environmental concerns, shifting client preferences, and technological advancements. These new advancements, such as digital banking, blockchain, artificial intelligence, cybersecurity, sustainable banking, and open banking, are changing the outlook of financial services and the banking industry in the manner they are delivered and consumed. In order to ensure that the banking system remains safer, secure, inclusive, and resilient in the face of these changes, regulators, financial institutions, and technology providers must continue to collaborate with the regulator and policy makers to meet the rising ethical and regulatory concerns. Law, rules, regulation, and governance will continue to play an important role in the banking industry’s progress, balancing innovation with the protection of consumer rights and financial stability.

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Assessing Financial Health and Banking Finance Impact on Startups in India: A Ratio-Based Analysis

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Abstract

This research explores the multifaceted challenges faced by startups in India in accessing banking finance and evaluates the financial health of lending institutions to understand the broader implications for startup funding. The study adopts a mixed-methods approach, utilizing secondary data from government reports, policy documents, and financial statements. Quantitative data were analyzed using descriptive and comparative statistical methods, while qualitative inputs were examined through content analysis to identify recurring themes and systemic issues.

The financial performance analysis reveals critical insights into the banking sector's operational and profitability dynamics from 2019 to 2024. Despite maintaining a stable Capital Adequacy Ratio (CAR) above regulatory norms, a declining Advances-to-Funds ratio and rising cost metrics suggest a cautious lending environment. Investment valuation and profitability indicators show deteriorating trends, including reduced dividend payouts, falling operating profits, and a narrowing interest spread, highlighting a contraction in shareholder value and operational efficiency. Debt coverage and leverage ratios expose high reliance on borrowed funds and declining financial charge coverage, raising concerns about long-term sustainability. Liquidity indicators, such as the current and quick ratios, display contradictory patterns, signaling inconsistencies in short-term financial resilience.

Profitability ratios further confirm diminishing returns, with Net Profit Margin and Return on Net Worth

showing a sharp decline over the observed period. These trends suggest tightening margins and highlight the pressing need for strategic interventions to enhance access to finance for startups. The findings underscore the importance of financial innovation, targeted policy support, and institutional reforms to ensure startups can thrive in a capital-constrained environment.

This study contributes valuable empirical insights into the intersection of startup financing and banking sector health in India, offering actionable recommendations to improve financial accessibility and foster a more supportive ecosystem for entrepreneurial growth.

Keywords: *Startup financing, Banking finance, India, Entrepreneurship, Small business*

Introduction

India has rapidly emerged as a global hub for startups, with an increasing number of entrepreneurs launching innovative ventures across diverse sectors. These startups are reshaping traditional industries, introducing disruptive business models, and driving innovation. However, securing the capital needed for growth and sustainability remains one of the most significant challenges for Indian startups.

In March 2010, then-President Pratibha Patil declared the 2010s as the 'Decade of Innovation,' signaling the government's vision for fostering a culture of creativity and entrepreneurship. Since then, various departments and ministries have introduced supportive policies and programs aimed at realizing this vision.

Recognizing the vital role startups play in economic growth, the Government of India launched the flagship **Startup India** initiative in 2022. This program provides a range of support measures, including tax incentives, funding opportunities, and incubation facilities, to encourage entrepreneurship and innovation.

Despite these efforts, access to finance remains a critical issue—one that was further exacerbated by the COVID-19 pandemic. According to a study by **NASSCOM** (National Association of Software and Service Companies), the pandemic significantly impacted India's startup ecosystem, particularly early-stage ventures. In 2020, seed-stage deal activity dropped by 37% compared to the previous year.

To address these challenges, the government introduced additional support mechanisms such as the **Startup India Seed Fund Scheme** and **Atmanirbhar Bharat Abhiyan** to bolster early-stage companies and SMEs. However, many startups, especially those in healthcare, education, and agriculture, still struggle to obtain financing.

Efforts to build a knowledge-based and digital economy have seen investments in ICT infrastructure and policies promoting e-governance, innovation, and collaboration between academia and industry. IT-enabled sectors such as e-commerce, transportation, and fintech have fuelled the growth of the startup landscape. However, this growth has been concentrated in major cities and affluent regions, leaving startups in Tier 2 and Tier 3 cities less aware of or connected to available government incentives and tax breaks.

Several systemic issues continue to hinder the growth of startups in India: fragmented markets, inconsistent government efforts, weak infrastructure, limited access to skilled professionals, and low awareness of support programs. There is a pressing need to expand outreach to smaller cities, streamline financial incentives, encourage credit disbursement to priority sectors, and improve overall access to institutional support.

Another critical issue has been the so-called "**angel tax**" under Section 56 of the Income Tax Act, which taxed startups on equity investments exceeding fair market value. Although the government granted retroactive relief through a notification in April 2024—subject to approval from an eight-member panel—concerns around such regulatory burdens persist.

Alternative financing methods such as **crowdfunding** and **peer-to-peer lending** are beginning to gain traction. These methods offer promising avenues for democratizing startup funding, especially for ventures lacking assets or track records. Yet, they face their own set of challenges, including legal and regulatory hurdles that may deter both investors and entrepreneurs.

Given these ongoing challenges, it is vital to explore the role of **banking finance** in the growth and sustainability of startups in India. This white paper aims to examine the impact of banking finance on startups, the barriers entrepreneurs face in accessing it, and potential strategies to improve the funding landscape.

While venture capital, angel investment, and alternative financing have grown in prominence, banking finance remains a crucial pillar of startup funding in India. This paper seeks to explore the following key questions:

- What is the current landscape of banking finance for startups in India, and how does it compare to other financing sources?
- What factors influence successful access to bank financing for startups?
- How does banking finance affect startup growth and long-term success?
- What are the key barriers to obtaining banking finance, and how can they be addressed?

To answer these questions, this study will combine a review of existing literature with original research, including surveys from a broad sample of startups across the country. Additionally, insights will be drawn

from case studies and expert interviews to provide a comprehensive picture of banking finance in the Indian startup ecosystem.

The structure of the paper is as follows:

- **Introduction and Background:** An overview of the Indian startup landscape and financing challenges.
- **Literature Review:** A critical examination of available funding sources, including banks, VCs, angel investors, and alternative finance.
- **Role of Banking Institutions:** An analysis of how traditional banks support (or fail to support) the startup ecosystem.
- **Research Methodology:** An outline of the data collection process, including sample selection, survey tools, and analytical methods.
- **Findings and Analysis:** An in-depth look at how banking finance affects startup growth and what factors contribute to or hinder access.
- **Discussion:** A summary of key findings, highlighting the benefits of banking finance and the obstacles faced by entrepreneurs.
- **Recommendations:** Policy suggestions and best practices for improving access to banking finance, especially in underrepresented regions.

In conclusion, this white paper provides a detailed assessment of banking finance's role in the Indian startup ecosystem. By identifying current gaps and offering actionable recommendations, the goal is to assist policymakers, financial institutions, and entrepreneurs in creating a more inclusive and effective support system for startups across India.

Sources of Financing for Startups in India

a. Venture Capital (VC):

Venture capital remains a prominent source of funding for startups in India. According to a KPMG report, India ranked as the third-largest destination for VC investment globally in 2019, attracting over USD 14 billion. However, VC funding tends to be highly concentrated among a small number of high-growth startups, leaving many early-stage ventures without

access. Furthermore, venture capital usually comes with stringent terms, including substantial equity dilution, which may not be ideal for all entrepreneurs.

b. Angel Investment:

Angel investors—typically high-net-worth individuals who provide capital in exchange for equity—have become an increasingly popular funding source in India. Compared to venture capital, angel investment often involves more flexible terms and includes mentorship and networking support. Nonetheless, access to angel investment is generally limited to startups located in metropolitan hubs like Mumbai, Bengaluru, and Delhi, making it less accessible for entrepreneurs in smaller cities.

c. Crowd funding:

Crowdfunding is an emerging alternative financing model that allows startups to raise capital from a large pool of individual investors through online platforms. Although it holds the promise of democratizing startup finance, crowdfunding remains underutilized in India due to low awareness, limited platform availability, and regulatory ambiguity.

d. Banking Finance:

Traditional banking institutions continue to be a primary source of finance for many Indian startups, particularly those without access to venture capital or angel investment. However, securing loans from banks is often a formidable task. Most banks require extensive documentation, collateral, and a proven record of profitability—requirements that many startups, especially in their nascent stages, are unable to meet. Additionally, high interest rates and bureaucratic procedures further restrict access to bank finance.

Challenges Faced by Startups in Accessing Finance

a. Regulatory Complexity:

The Indian regulatory landscape presents numerous hurdles for startups. Navigating tax compliance, labor laws, and intellectual property regulations can be both time-consuming and expensive. This complexity creates uncertainty, which can discourage both

domestic and foreign investors—particularly in sectors with heavy regulation.

b. Collateral Requirements:

One of the major barriers to accessing bank finance is the requirement for collateral. Banks typically ask for tangible assets, such as property or machinery, to secure loans. However, early-stage startups often lack significant physical assets, making them ineligible for traditional loans. This requirement disproportionately affects startups that are knowledge- or service-based.

c. Lack of Credit History:

Startups, by their nature, lack established credit histories or long-standing banking relationships. Banks are generally risk-averse and prefer lending to businesses with a proven track record of revenue and profitability. For newly established startups, meeting these criteria is often unrealistic, thereby restricting their access to financial support through formal channels.

Review of Literature

The growth of startups in India has been significant over the past decade, especially with policy support from government initiatives such as Startup India and increased investor interest. However, access to banking finance continues to be one of the major challenges impeding the sustainability and scalability of these startups. This literature review synthesizes previous research on the financial challenges of startups, the role of banks in startup financing, and strategic interventions aimed at bridging the financing gap.

Challenges in Accessing Banking Finance

Startups often face difficulties in obtaining finance from banks due to their limited operating history, lack of collateral, and high-risk profiles. According to Chandra and Chatterjee (2021), traditional banks are generally risk-averse and prefer lending to established businesses with predictable cash flows. This leaves startups with fewer avenues for funding, especially in the early stages. Similarly, Sahu and Pandey (2020)

noted that documentation requirements, lack of financial literacy among entrepreneurs, and banks' limited understanding of startup business models contribute to the access gap.

Basu et al. (2021) also identified sectoral bias and regional disparities in financing, with startups in Tier I cities receiving more favorable attention than those in smaller towns or Tier II/III cities. The procedural complexities, high transaction costs, and longer loan processing periods further hinder banking institutions from effectively serving startups.

Role of Government and Policy Measures

Various policy interventions have been introduced to ease access to finance for startups. The Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE), Fund of Funds for Startups (FFS), and the SIDBI Startup Mitra platform are a few such initiatives. Sharma and Jain (2020) emphasized that while these schemes are well-intentioned, their implementation often suffers from lack of awareness, bureaucratic delays, and limited reach.

The Startup India initiative, launched in 2022, aimed to promote bank financing and reduce regulatory burdens. As noted by Gupta and Saxena (2021), the impact of this initiative has been mixed. While it improved startup registration and provided access to funding via SIDBI, many entrepreneurs remained unaware or excluded due to eligibility criteria or lack of information dissemination.

Banking Institutions and Financial Innovation

Banking institutions have attempted to support startups through innovation in credit assessment mechanisms, such as cash flow-based lending, fintech partnerships, and MSME-focused loan products. According to Mehta and Dhingra (2021), banks partnering with fintech firms have shown promise in evaluating creditworthiness based on alternative data, thus improving credit access for startups.

Rao (2022) analyzed public and private banks' role in startup financing and concluded that private sector

banks were more responsive and quicker in adapting to new credit models for startups, while public sector banks lagged due to structural inertia and compliance-heavy processes.

Impact of Banking Finance on Startup Growth

Access to banking finance not only aids in startup formation but also significantly influences scalability and sustainability. As highlighted by Kumar and Kapoor (2020), banking finance allows startups to build infrastructure, hire talent, and invest in technology, thereby improving their competitive position. The absence of timely and sufficient bank finance, on the other hand, results in stunted growth and even premature shutdowns.

Startups that received institutional credit also reported better investor confidence and operational discipline, according to a longitudinal study by Bhattacharya et al. (2021). Furthermore, bank-backed startups were more likely to receive follow-on funding from venture capitalists due to the perceived legitimacy of their operations.

Strategic Measures and Recommendations

Scholars have proposed various strategic measures to enhance banking finance access for startups. These include:

- **Strengthening Credit Appraisal Frameworks:** Introducing sector-specific credit norms and dynamic credit scoring methods to better capture startup potential (Patil & Ramesh, 2022).
- **Capacity Building for Bank Officials:** Training programs to improve bankers' understanding of startup dynamics and risk assessment.
- **Simplification of Loan Procedures:** Streamlining documentation and application processes, particularly for early-stage startups.
- **Promotion of Cluster-Based Lending Models:** Encouraging banks to create specialized startup desks or cluster-specific financing hubs (Verma & Joshi, 2023).

These strategies, if effectively implemented, can significantly reduce the financial exclusion experienced by startups and enhance their contribution to economic growth and innovation.

Objectives and Research Questions

- To evaluate the financial health and stability of startups by analyzing key balance sheet ratios and their trends over the period 2019-2024.
- To assess the profitability and operational efficiency of startups through the examination of investment valuation, profit and loss account, and management efficiency ratios.
- To understand the impact of banking sector lending patterns and debt coverage on startups' access to finance and their financial sustainability.

Research Methodology

The research is mainly based on secondary data.

Data Collection

To comprehensively address the research questions, secondary data sources are utilized through the following methods:

- **Secondary Data**

A thorough review of existing literature, including research papers, articles, and policy documents related to banking finance and startups in India, will be conducted. Additionally, relevant government reports, official financial statements of banks and startups, and regulatory frameworks will be examined. This secondary data will help in understanding the challenges startups face in accessing banking finance, the role of banking finance in the growth and success of startups, and potential measures to enhance financial accessibility for startups in India.

Data Analysis

Both quantitative and qualitative methods are employed to analyze the collected data:

• Descriptive Statistics

Survey responses will be analyzed using descriptive statistical techniques to identify key trends, patterns, and insights. This analysis will shed light on the current landscape of banking finance for startups, the prevalent challenges, and possible improvements in access to banking finance.

• Content Analysis

Qualitative data gathered from literature reviews and any interviews will be subjected to content analysis to extract recurring themes and patterns. This will assist in understanding the broader impact of banking finance on the growth trajectory and success factors of startups in India.

• Comparative Analysis:

Data from secondary sources will be compared and contrasted to highlight similarities and differences in perspectives between startups and banking institutions. This comparative approach will inform recommendations aimed at improving banking finance accessibility for startups.

Analysis of Financial Performance of Start-Ups in India

Table 1. Balance Sheet Ratios

Ratios/Years	2024	2023	2022	2021	2019
Capital Adequacy Ratio	14.2	13.9	14.1	14.1	14.5
Advances/Loans Funds (%)	74	75.2	79.3	79.1	78.3

Source: Secondary Data

Interpretation:

Capital Adequacy Ratio (CAR)

- The CAR has remained **stable** over the years, fluctuating slightly between **13.9% and 14.5%**.
- In **2024**, the CAR is **14.2%**, up slightly from **13.9% in 2023**.

- This indicates that the bank has **maintained a healthy capital buffer**, which is **well above the regulatory minimum (generally 10.5% in India)**, signaling **strong solvency and risk management practices**.

Advances to Loans Funds Ratio

- There is a **declining trend** from **79.3% in 2022** to **74% in 2024**.
- This could suggest that the bank is becoming **more conservative in lending**, possibly due to increased risk aversion, tightening credit standards, or a focus on liquidity.
- A lower ratio may indicate **idle funds or reduced credit demand**, while a very high ratio could indicate **aggressive lending**, which carries higher risk.

Table 2. Investment Valuation Ratios

Ratios/Years	2024	2023	2022	2021	2019
Face Value	10	10	10	10	10
Dividend Per Share	2.5	5.2	5.7	7.6	8.5
Operating Profit Per Share(Rs)	30.18	38.24	36.14	44.38	46.99
Net Operating Profit Per Share (Rs)	340.21	331.07	329.05	325.26	287.6

Interpretation:

Dividend Per Share (DPS): Dividend per share has shown a continuous declining trend from Rs. 8.5 in 2019 to Rs. 2.5 in 2024. This reduction could signal a strategic shift by the company towards retaining a larger portion of its earnings for reinvestment or managing financial pressures such as declining profitability or increasing operational costs. While this may concern income-focused investors who rely on dividend returns, it could also indicate a focus on long-term growth and strengthening of the company's financial position.

Operating Profit Per Share (OPPS): Operating Profit Per Share has gradually decreased from Rs. 46.99 in 2019 to Rs. 30.18 in 2024, despite minor fluctuations. This downward trend suggests that the company is experiencing pressure on its operating margins, potentially due to rising expenses, inefficiencies in operations, or increased competition. This decline may reflect challenges in converting core operations into profits, which warrants closer attention from management and investors.

Net Operating Profit Per Share (NOPPS): In contrast to other indicators, Net Operating Profit Per Share has steadily increased from Rs. 287.6 in 2019 to Rs. 340.21 in 2024. This growth reflects the company's ability to enhance its total operating income over time, indicating robust revenue generation from its primary business activities. The rising NOPPS, despite falling dividends and operating profit per share, suggests that the company's top-line growth remains strong and may translate into improved profitability if cost efficiencies are achieved.

Table 3. Debt Coverage Ratios

Ratios/Years	2024	2023	2022	2021	2019
Credit Deposit Ratio	74.35	75.83	75.89	75.57	74.07
Investment Deposit Ratio	29.48	29	30.16	31.36	33.11
Cash Deposit Ratio	6.03	5.84	5.87	6.09	6.82
Total Debt to Owners Fund	14.49	14.69	15.5	14.88	14.61
Financial Charges Coverage Ratio	2.27	2.28	2.28	2.34	2.45
Financial Charges Coverage Ratio Post Tax	74.35	75.83	75.89	75.57	74.07

Interpretation:

Credit Deposit Ratio: The Credit Deposit Ratio has remained relatively stable, ranging between 74.07% in 2019 and 75.89% in 2022, with a slight decline to 74.35% in 2024. This ratio indicates the proportion of deposits used for lending. A ratio in the 74-76%

range suggests a balanced credit deployment strategy, with the bank efficiently using its deposits for generating interest income while maintaining sufficient liquidity to manage obligations and mitigate credit risk. **Investment Deposit Ratio:** The Investment Deposit Ratio has shown a gradual decline from 33.11% in 2019 to 29.48% in 2024. This suggests that the bank has been reducing its share of deposits invested in government securities or other investments. The decreasing trend might reflect a strategic reallocation of funds from low-yield investments towards higher-yielding credit activities or other operational needs, but it also signals potentially lower income from safer, fixed-income sources.

Cash Deposit Ratio: The Cash Deposit Ratio has slightly declined from 6.82% in 2019 to 6.03% in 2024, indicating a modest reduction in the cash reserves maintained against total deposits. This ratio reflects the bank's liquidity position. While the decrease is not drastic, it implies a tighter liquidity buffer, which may be due to increased lending or more active fund utilization. However, maintaining adequate liquidity remains essential for daily operations and deposit withdrawals.

Total Debt to Owners' Fund: This ratio has remained stable around the 14.5-15.5 range over the years, with a slight dip to 14.49 in 2024. It reflects the proportion of total debt compared to shareholders' equity. A relatively constant ratio indicates that the bank has not significantly increased its leverage and has managed its capital structure prudently. Stability in this ratio is a sign of financial discipline and a balanced approach to debt financing.

Financial Charges Coverage Ratio: The Financial Charges Coverage Ratio has slightly declined from 2.45 in 2019 to 2.27 in 2024. This ratio measures the bank's ability to cover its interest obligations from its earnings before interest and taxes (EBIT). While still above 2.0, which is generally acceptable, the downward trend suggests a slight reduction in the bank's earnings capacity to meet financial charges, possibly due to reduced operating margins or higher interest expenses.

Financial Charges Coverage Ratio Post Tax: There seems to be a data entry error here, as the values provided for this ratio are identical to the Credit Deposit Ratio for each year (74.35, 75.83, etc.). Normally, this ratio should be lower than the pre-tax version since it accounts for tax obligations. If this is indeed a duplication error, corrected data would be needed to make an accurate interpretation.

Table 4. Profit and Loss Account Ratios

Ratios/Years	2024	2023	2022	2021	2019
Interest Expended / Interest Earned	73.63	72.86	72.41	68.43	64.88
Other Income / Total Income	10.88	8.92	9.25	9.48	10.15
Operating Expense / Total Income	17.89	16.52	17.41	18.52	16.58

Interpretation:

Interest Expended/Interest Earned: This ratio has shown a rising trend from 64.88% in 2019 to 73.63% in 2024, indicating that the cost of interest-bearing liabilities (like deposits) is increasing relative to the interest income earned from lending and investments. A higher ratio implies shrinking interest margins, meaning the bank retains a smaller portion of interest income after paying interest on deposits and borrowings. The consistent rise in this ratio points to margin compression, possibly due to higher cost of funds, increased competition in lending, or lower lending rates.

Other Income/Total Income: The contribution of other income (such as fees, commissions, trading income, etc.) to total income has fluctuated slightly but remained within a narrow range of 8.92% to 10.88% over the period. In 2024, it stands at 10.88%, which is a positive sign, indicating a slight shift towards diversifying revenue sources beyond traditional interest income. A higher share of other income can reduce reliance on interest spreads and help stabilize earnings in a volatile interest rate environment.

Operating Expense / Total Income: Operating expenses as a percentage of total income have shown

moderate variation, decreasing from 18.52% in 2021 to 17.89% in 2024, after peaking at that level. Although the ratio slightly increased in 2024 compared to 2023 (16.52%), it is still within a manageable range. This suggests that the bank is fairly efficient in controlling its operational costs relative to income, but should remain cautious of cost escalation. Maintaining this ratio below 20% is generally viewed as efficient in the banking sector.

The trends indicate that while the bank is experiencing narrowing interest margins, it is making efforts to supplement income through other sources and is maintaining operational cost efficiency. The key challenge appears to be rising interest costs, which could impact profitability unless offset by higher lending rates, better asset quality, or improved fee-based income.

Table 5. Leverage Ratios

Ratios/Years	2024	2023	2022	2021	2019
Current Ratio	0.04	0.31	0.04	0.04	0.03
Quick Ratio	26.61	23.8	22.77	20.53	21.2

Interpretation:

Current Ratio: The Current Ratio has remained very low across all years, hovering between 0.03 and 0.31, with values of 0.04 in 2024, 2022, and 2021, and a temporary spike to 0.31 in 2023. This ratio measures a firm's ability to meet short-term obligations using its current assets. A ratio below 1 indicates that the bank may not have enough current assets to cover its short-term liabilities. However, in the banking industry, a low current ratio is not necessarily alarming, as banks typically operate with high levels of short-term liabilities and rely on liquidity management and interbank operations. Still, the very low ratio suggests a tight liquidity position, requiring close monitoring to avoid liquidity stress.

Quick Ratio: The Quick Ratio has shown a consistent upward trend, increasing from 21.2 in 2019 to 26.61 in 2024. This ratio is a stricter measure of liquidity as it excludes inventories and measures a firm's ability to pay its current liabilities with its most liquid assets.

In banking, this typically reflects cash reserves, balances with RBI, and other easily liquidated instruments. The rising quick ratio suggests strong improvement in immediate liquidity and the bank's ability to meet short-term obligations promptly. This could reflect better cash management practices and a more conservative liquidity policy.

While the current ratio remains very low, consistent with industry norms, the increasing quick ratio is a positive sign, indicating that the bank is strengthening its short-term liquidity position. This improved liquidity may help the bank better manage unexpected obligations and regulatory requirements, contributing to financial stability.

Table 6. Profitability Ratios

Ratios/Years	2024	2023	2022	2021	2019
Interest Spread	7.3	7.17	7.16	7.89	8.53
Adjusted Cash Margin (%)	5.98	7.84	8.8	12.21	14.83
Net Profit Margin	5.57	7.54	8.8	12.58	15.48
Return on Long Term Fund (%)	95.81	103.6	108.4	104.5	105.8
Return on Net Worth (%)	6.47	9.2	11.01	15.99	19.67
Adjusted Return on Net Worth (%)	6.47	9.2	11.01	15.99	19.67
Return on Assets Excluding Revaluations	281.8	262.7	249.4	244.1	216.1
Return on Assets Including Revaluations	339.7	310	299.6	270.5	243.2

Interpretation:

Interest Spread: The Interest Spread, which reflects the difference between interest earned and interest expended, has declined steadily from 8.53% in 2019 to 7.3% in 2024. This downward trend indicates margin compression, possibly due to rising funding costs or competitive lending rates. A narrowing spread can hurt profitability, as it reduces the earnings from the bank's core lending operations. The bank may need

to optimize its asset-liability mix or increase fee-based income to offset this decline.

Adjusted Cash Margin: The Adjusted Cash Margin has dropped significantly from 14.83% in 2019 to 5.98% in 2024, reflecting reduced operational cash profitability. This indicates that a smaller portion of revenue is being converted into actual cash profits after adjusting for certain costs or provisions. The sharp decline signals that the bank's ability to generate cash from its operations is weakening, possibly due to higher expenses or lower efficiency.

Net Profit Margin: The Net Profit Margin has also fallen steeply, from 15.48% in 2019 to just 5.57% in 2024, suggesting a significant erosion in bottom-line profitability. This decline may be attributed to rising interest costs, operating expenses, or provisioning for bad loans. It highlights a concerning trend, where the bank is earning less net profit from its total income, which could impact shareholder value and overall financial strength.

Return on Long-Term Fund: This ratio reflects the efficiency with which long-term funds are utilized to generate returns. It has remained consistently high, though slightly declining from 108.4% in 2022 to 95.81% in 2024. Despite the drop, the ratio is still strong, indicating that the bank continues to make productive use of its long-term capital, likely through sound lending or long-term investments.

Return on Net Worth (RoNW) and Adjusted RoNW: Both these ratios have declined sharply from 19.67% in 2019 to 6.47% in 2024, reflecting a significant fall in returns to shareholders. This suggests a deterioration in overall profitability and capital efficiency. Lower RoNW means the bank is generating less income for every rupee of shareholder equity, which can be a red flag for investors looking for high returns.

Return on Assets (Excluding and Including Revaluations): Both versions of Return on Assets (ROA) have shown an upward trend, with ROA (excluding revaluations) rising from 216.1 in 2019 to 281.8 in

2024, and ROA (including revaluations) increasing from 243.2 to 339.7 during the same period. This improvement suggests that the bank is using its total asset base more efficiently to generate profits, even in the face of declining margins. The higher ROA (including revaluations) also shows the value unlocked through asset appreciation or revaluation gains.

The bank is experiencing a clear decline in profitability margins and returns to shareholders, but is still maintaining relatively high returns on assets and long-term funds. This mixed performance suggests that while operational efficiency and capital usage are strong, the overall profitability is under pressure—likely from rising costs, reduced margins, and lower income from core operations. Strategic changes in revenue mix, cost management, or digital efficiency might be needed to restore profitability metrics.

Table 7. Management Efficiency Ratios

Ratios/Years	2024	2023	2022	2021	2019
Interest Income/ Total Funds	9.4	9.54	9.9	10.3	10.48
Net Interest Income / Total Funds	3.37	3.48	3.62	4.1	4.49
Non-Interest Income / Total Funds	2.01	1.83	1.89	1.95	2.05
Interest Expended / Total Funds	7.13	7.17	7.38	7.31	7.09
Operating Expense / Total Funds	2.66	2.52	2.67	2.86	2.71
Profit Before Provisions / Total Funds	2.65	2.71	2.77	3.13	3.76
Net Profit / Total Funds	1.46	1.64	1.77	2.15	2.44
Loans Turnover	1.23	1.23	1.23	1.24	1.25

Total Income / Capital Employed (%)	10.31	10.27	10.69	11.2	11.4
Interest Expended/ Capital Employed (%)	7.13	7.17	7.38	7.31	7.09
Total Assets Turnover Ratios	1.18	1.18	1.19	1.19	1.19
Asset Turnover Ratio	1.18	1.19	1.19	1.19	1.2

Interpretation:

Interest Income/Total Funds: The Interest Income to Total Funds ratio has declined steadily from 10.48% in 2019 to 9.4% in 2024, indicating a decrease in the yield earned on the bank's total funds (including deposits and borrowings). This trend suggests that the bank is earning lower returns from its lending and investment operations, possibly due to interest rate compression, subdued credit growth, or risk-averse lending strategies.

Net Interest Income/Total Funds: This ratio, which reflects the core profitability from lending activities, has also dropped from 4.49% in 2019 to 3.37% in 2024. The decline is a direct result of narrowing interest spreads and rising interest costs, showing that the profit margin from interest operations is shrinking, which could negatively impact the bank's long-term earnings potential if not counterbalanced by fee income or operational efficiency.

Non-Interest Income/Total Funds: Non-interest income to total funds has remained relatively stable, hovering around 2%, with 2.01% in 2024. This steady contribution from sources like fees, commissions, and trading income shows that the bank maintains a balanced revenue model. However, the slight decline from 2.05% in 2019 suggests there is room to further diversify income sources, especially given the pressure on interest margins.

Interest Expended/Total Funds: The interest cost relative to total funds has increased slightly from 7.09% in 2019 to 7.13% in 2024, though the movement has been relatively stable. This marginal rise suggests that funding costs have been fairly well-controlled, but even small increases can erode net interest margins in a low-yield environment.

Operating Expense/Total Funds: Operating expenses as a percentage of total funds have remained within the 2.5%–2.9% range, with 2.66% in 2024. The trend indicates consistent cost management, though the expenses remain slightly elevated compared to earlier years. The bank seems to be making efforts to contain costs, which is critical given declining margins.

Profit Before Provisions/Total Funds: This ratio has declined from 3.76% in 2019 to 2.65% in 2024, indicating a reduction in pre-provision operating profit. This suggests a weaker buffer for absorbing credit losses or provisioning, which could become a concern in times of economic stress or rising non-performing assets.

Net Profit/Total Funds: The Net Profit to Total Funds ratio shows a steady decline from 2.44% in 2019 to 1.46% in 2024, reflecting a drop in overall profitability. This trend aligns with declining margins and rising cost pressures, signaling the need for revenue diversification and enhanced cost-efficiency strategies.

Loans Turnover: The Loans Turnover ratio has been almost constant at around 1.23–1.25, indicating stable loan book utilization. While this shows consistency in credit operations, the lack of growth also reflects limited expansion in lending activities, which could be due to cautious credit policies or weak credit demand.

Total Income/Capital Employed: This ratio, which measures how efficiently the bank is generating income from its capital base, has decreased from 11.4% in 2019 to 10.31% in 2024. Though the decline is modest, it still signals reduced efficiency in using shareholders' capital to generate returns, and could impact investor sentiment if the trend continues.

Interest Expended/Capital Employed: The interest cost relative to capital employed has increased slightly from 7.09% in 2019 to 7.13% in 2024, matching the trend seen in the interest expended on total funds. This reflects slightly higher cost of capital, which adds to the strain on profitability.

Total Assets Turnover Ratios & Asset Turnover Ratio: Both ratios have remained virtually unchanged, ranging between 1.18 and 1.20, indicating stable utilization of assets in generating income. While this shows consistent operational efficiency, the lack of improvement over time suggests there is little innovation or scaling in asset deployment, which could hinder long-term growth.

The management efficiency ratios highlight declining returns across key performance areas, especially in interest income, net interest margins, and profitability per fund deployed. While the bank has kept operating costs and asset utilization steady, the overall trends point to a pressing need for strategic improvement in revenue generation, cost efficiency, and capital productivity to sustain growth and profitability.

Conclusion

In conclusion, the startup ecosystem in India has been growing rapidly in recent years, with entrepreneurs launching innovative businesses across the country. In the aftermath of the COVID-19 epidemic, however, many new businesses still struggle to get access to funding. The Indian government has launched several initiatives, such as Startup India and the Startup India Seed Fund, to support the startup ecosystem. Despite these measures, access to finance remains a significant challenge for many startups, particularly those operating in sectors such as healthcare, education, and agriculture.

Banking finance remains a critical component of startup financing in India. While there are various sources of finance available to startups, including venture capital, angel investors, and crowdfunding, the availability of bank financing is crucial to the

development and success of new businesses. The purpose of this article is to investigate how banking financing affects the startup environment, the challenges faced by startups in accessing banking finance, and the potential solutions to address these challenges.

The research suggests that banking finance has a positive impact on startup growth, but startups face several barriers in accessing it, such as lack of collateral, credit history, and awareness of government schemes. The study suggests streamlining financing and tax advantages for local and international investors, raising knowledge of government incentives, expediting credit distribution to priority industries, boosting outreach and network benefits to Tier 2 and 3 cities, and more.

This paper highlights the importance of banking finance for startups in India and the need for policymakers, investors, and entrepreneurs to work together to foster a more supportive environment for startups to thrive. The findings of this paper provide insights and recommendations to improve access to banking finance for startups in India and contribute to the growth and success of the startup ecosystem in the country.

Indian banks are facing an increasingly globalized environment due to regulatory and technological factors, as well as cross-border financial flows over which they may have limited control. To ensure their current and future business growth, banks must efficiently mobilize the required capital from the market while meeting prudential requirements.

Additionally, banks should leverage technology-enabled payment systems to expand their customer base and product choices in an affordable, accessible, acceptable, and assured manner.

There is significant potential for increasing the size and capacity of the banking structure in India, as advances of public sector banks are increasing at a faster rate than private and foreign banks. However,

there is also a pressing need for a robust mechanism to control the increasing non-performing assets (NPA) in the banking sector.

To remain dynamic and flexible while ensuring safety and systemic stability, there is a need to reorient the banking structure in India. The competition from global banks and technological innovations has forced Indian banks to rethink their policies and strategies. To compete and survive, Indian banks must diversify and upgrade themselves to offer different products to their customers.

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A Study on The Issues of Non-Performing Assets (NPAs) Among The Indian Banks: Government & RBI Measures

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Abstract

Non-Performing Assets (NPAs) were the one of the major reasons for various financial crisis such as US Subprime crisis pose a significant threat to the financial stability of a country. Non-Performing Assets (NPAs) have emerged as a major concern for the Indian banking sector. This study delves into the critical issues surrounding NPAs in India, exploring their risk profile among Indian banks, consequences, and trends of NPAs from year to year, comparison between public and private sector banks NPAs, India's position in global Bad loans and Government and RBI measures to address the challenges of NPAs.

Key words: *NPA, RBI measures*

An Overview of Indian Banking and Non-Performing Assets (NPAs)

The Indian banking sector plays a pivotal role in fuelling economic growth by providing credit to individuals and businesses. However, growing NPAs threatens this vital function. If loan principal and interest is not paid for more than 90 days from its due date, then such loan account is classified as Non-Performing Asset (NPAs) according to Reserve Bank of India. NPAs are further classified into substandard asset, doubtful asset and loss asset. Substandard asset refers to a loan account when it is in the NPA classification for more than 12 months, Doubtful Loss asset refers to a loan account when it is in substandard asset classification for 12 months or more and Loss Asset refers to a loan account which declared as little or no salvage value by the bank auditors.

Existence of NPAs among banks can pose the greater risk to their financial health. More the NPAs held by the banks requires them to keep more the provision to cover losses, which will reduce the profit margin of the banks. Increase in the NPA among the banks leads to slow down in the economic growth because when banks are reluctant to give loan to specific sectors of the economy due to the fear of bad loans then such sectoral growth will be effected due to non-availability of the credit. As a result of non-availability of the credit leads to slow down in the sectoral growth, GDP growth and exports due to reduction in the industrial output which resultantly leads depression in the economy.

Factors Influence the NPAs

NPAs in India, akin to other nations, are influenced by a myriad of factors. Here's are the key determinants impacting NPAs within the Indian banking sector:

1. **Economic Climate:** The broader economic landscape, encompassing metrics like GDP growth, inflation, and industrial output, holds substantial sway over NPAs. Economic downturns often precipitate difficulties for businesses in meeting loan obligations, thus fostering a surge in NPAs.
2. **Sector-specific Challenges:** Certain industries, such as infrastructure, power, and steel, grapple with unique hurdles affecting loan repayments. Factors like project delays, policy ambiguities, and market volatilities have historically contributed to elevated NPAs in these sectors.

3. **Regulatory Dynamics:** Alterations in regulatory frameworks, spanning restructuring guidelines, provisioning mandates, and loan categorization norms, exert notable influences on NPAs. Regulatory interventions, like the implementation of the Insolvency and Bankruptcy Code (IBC), also shape NPA resolution endeavours.
 4. **Credit Risk Management:** The efficacy of banks' credit risk management methodologies, encompassing loan assessment standards, monitoring protocols, and risk evaluation frameworks, bears a direct impact on NPAs. Deficient credit appraisal procedures can precipitate heightened NPA levels.
 5. **Interest Rate Fluctuations:** Variations in interest rates directly affect borrowing costs for entities and individuals. Elevated interest rates amplify financial burdens on borrowers, thereby escalating default rates and NPAs.
 6. **Asset Quality Assessment:** The rigor and efficacy of asset quality evaluations conducted by banks significantly influence NPAs. Transparent and timely identification of stressed assets constitutes a pivotal facet of adept NPA management.
 7. **Corporate Governance Standards:** Robust corporate governance practices within both banking institutions and corporate entities play pivotal roles in NPA mitigation. Inadequate governance mechanisms can engender fund mismanagement, diversion, and ultimately, escalate NPAs.
 8. **Global Economic Trends:** Global economic dynamics, encompassing shifts in commodity prices, currency valuations, and geopolitical scenarios, indirectly impact NPAs in India by virtue of their repercussions on domestic markets and businesses.
 9. **Government Policies and Aid:** Governmental policies, initiatives, and support measures aimed at fostering economic expansion, ameliorating stressed assets, and bolstering specific sectors wield discernible influences on NPA levels within the banking ecosystem.
 10. **Technological Disruptions:** Technological advancements and disruptions pose transformative impacts on industries and enterprises, thereby altering their repayment capacities. For instance, the ascent of fintech enterprises and digital platforms may perturb traditional banking paradigms and creditworthiness evaluations.
- Effectively addressing NPAs necessitates a holistic strategy encompassing regulatory overhauls, bolstered risk management frameworks, economic stimulus endeavours, and sector- tailored interventions geared towards fostering sustainable growth and financial resilience.

Objectives of The Study

- To examining the factors impacting NPAs, assessing risk profiles, and tracking trends of Non-Performing Assets (NPAs) in Indian banks.
- To compare the NPA situation between public and private sector banks in India and India's position globally.
- To evaluate the effectiveness of government and RBI measures implemented to address NPA challenges.

Review of Literature

- Das, Sulagna, and Abhijit Dutta (2014) analyse Non-Performing Assets (NPAs) of Public Sector Banks (PSBs) in India. They employ secondary data and statistical techniques to investigate NPA trends and identify any significant differences between banks. Their research focuses on understanding the severity of the NPA issue for PSBs.
- Rajeev & Mahesh (2010) examine the relationship between banking sector reforms and NPAs in Indian commercial banks. Their study, published by the

Institute for Social and Economic Change, likely explores the impact of reforms on NPA generation and explores potential consequences.

- Singh (2016) investigates NPAs in Indian commercial banks, likely delving into their causes and recovery mechanisms. Published in the Annual Research Journal of SCMS, Pune, this study offers insights into as how banks manage and recover from NPAs.
- Bawa et al. (2019) present a comprehensive analysis of NPAs in Indian banks using a framework of 31 financial ratios. Their research, published in IIMB Management Review, likely explores how various financial metrics can be used to assess and potentially predict NPA risk.
- Miyan (2017) employs a comparative statistical approach to analyse NPAs in Public Sector Undertakings (PSUs) and private sector banks in India. This study, likely published in the International Journal of Advanced Research in Computer Science, might reveal differences in NPA management strategies between these two bank categories.

RBI’s Financial Stability Report(2024)

- India’s banking sector has witnessed continued improvement in asset quality, with the gross non-performing assets (GNPA) ratio dropping to 2.6% of total advances in September 2024, marking the lowest level in the past 12 years and the net NPA ratio stood at approximately 0.6%, as stated in the RBI’s December 2024 issue of the Financial Stability Report (FSR).
- “Fueled by declining slippages, higher write-offs, and steady credit demand, the GNPA ratio of 37 scheduled commercial banks (SCBs) fell to a multi-year low of 2.6%,” the report noted. The report highlighted that the improvement in asset quality was widespread across various sectors and bank groups.

- Additionally, the share of large borrowers in the GNPA of banks has steadily declined over the past two years. The asset quality of large borrower portfolios has improved significantly, with the GNPA ratio decreasing from 4.5% in March 2023 to 2.4% in September 2024.

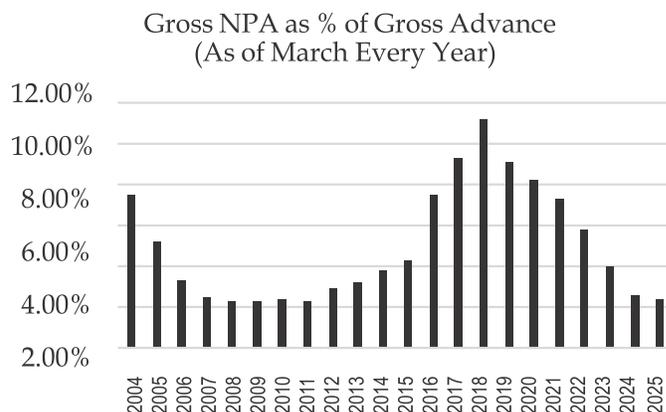
Research Methodology

- The data used in this research is based on secondary sources such as journals, articles, reports of RBI and World Bank, websites. etc.

Trend of Non-Performing Assets

- Gross NPA refers the total value of all the loan haven’t repaid by the borrowers within the 90 days from its due date.
- Net NPA = GNPA - Provisions made by the bank.

Chart 1: Showing Gross NPA of Indian Schedule Commercial Banks from 2004-2025

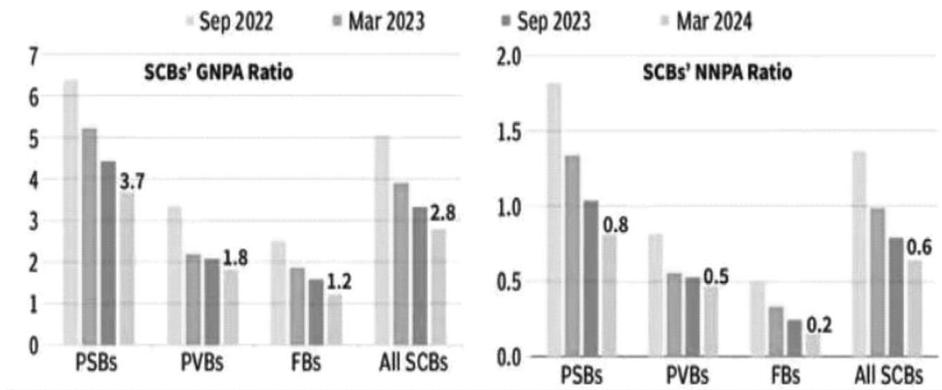


Source: RBI

In the Reserve Bank of India’s most recent Financial Stability Report, it was noted that the Gross NPA (GNPA) of scheduled commercial banks have decreased significantly since March 2018, dropping from 11.5 percent to 2.4 percent by March 2025. This demonstrates a positive trend in the reduction of non-performing assets in the banking sector over the specified period.

As per the RBI’s Financial Stability Report 2.4 percent Gross NPA ratio is the lowest since last 12 years.

Chart 2: Showing Gross NPA among Public Sector, Private Sector, Foreign banks and SFBs



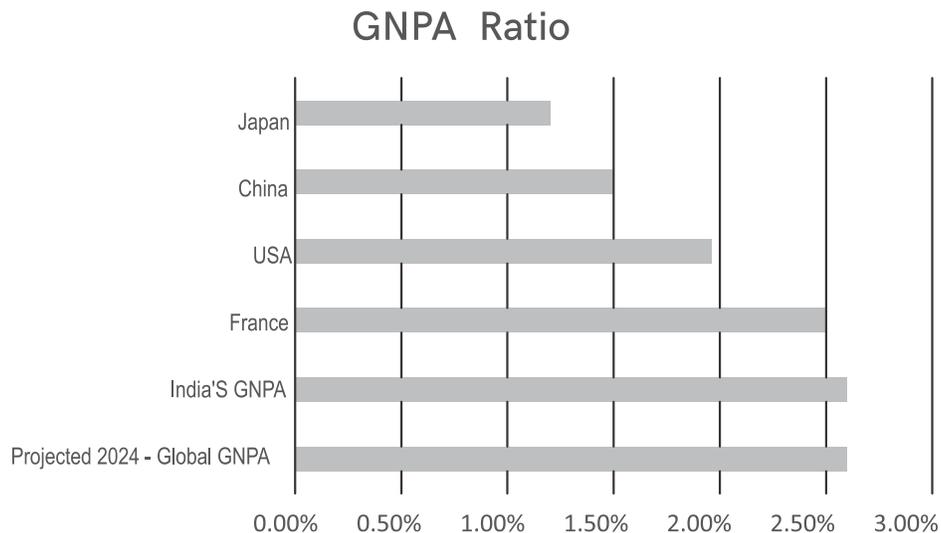
Source: RBI and Hindu Business Line

If the economy comes under significant stress, banks may see an uptick in bad loans. In such a scenario, the overall Gross NPA (GNPA) ratio across the banking sector could increase to 3.4%. Public Sector Banks (PSBs) are likely to be the most affected, with their GNPA ratio projected to rise from 3.7% in March 2024 to 4.1% by March 2025. Private Sector Banks (PVBs) may also experience a notable jump, with the ratio increasing from 1.8% to 2.8%. Foreign Banks (FBs), on the other hand, are expected to see a relatively modest increase from 1.2% to 1.3%.

Despite this downward trend in NPAs, the proportion remains relatively high when compared to other countries.

The International Monetary Fund (IMF) anticipates the global GNPA ratio to stay elevated at 3.2% in 2024, suggesting continued stress in asset quality. In comparison, the World Bank projects a lower GNPA ratio of 2.6%, pointing to a relatively healthier lending environment and reduced credit risk.

Chart 3: Showing Gross NPA among different countries in the year 2024



Source: World Bank

Write-Offs and Recovery

Loan write-off refers to removing loan amounts from the asset side of the bank's balance sheet for tax benefits, thus it reduces the non-performing assets (NPAs) on its books without relinquishing the bank's right to recover loan amount.

Over the past decade, banks have cleared bad loans totalling approximately ₹ 16.35 lakh crore from their books. The peak of these write-offs occurred in the financial year 2018-19, when a record ₹ 2.36 lakh crore in non-performing assets (NPAs) were removed. In contrast, the lowest volume of write-offs during this period was seen in 2014-15, amounting to around ₹ 58,786 crore.

In the financial year 2023-24, banks wiped out bad loans amounting to Rs. 1.70 lakh crore from their records - a decline compared to the Rs. 2.16 lakh crore written off in 2022-23. This reduction indicates a slight improvement in managing stressed assets or a more cautious lending approach.

From 2020-2024, public sector banks accounts 53% of total loan write-offs.

Recoveries from these loan write-off is very low which standing at 18.7%.

Table No1. Loan Write-offs among PSUs

Bank Name	FY24	FY23	FY22	FY21	FY20	FY19
Bank of India	9,749	8,655	10,324	8,732	7,628	7,417
Central Bank of India	10,001	10,258	1,236	5,992	4,169	10,375
Indian Bank	8,721	8,241	8,347	8,427	12,112	2,874
Indian Overseas Bank	7,214	3,412	3,769	4,618	16,407	7,683
Punjab & Sind Bank	755	2,128	1,050	71	1,780.87	1,635.04
Punjab National Bank	16,257	16,578	21,999	17,535	13,365	12,253
State Bank of India	8,595	15,729	12,696	17,590	12,549	17,782
UCO Bank	1,938	2,575	3,851	9,411	12,479	
Union Bank of India	18,264	19,175	19,484	16,984	16,425	7771
Total	92,012	1,04,749	1,00,723	1,04,238	1,12,721	87,082

Source: Investor Presentations

The country's biggest lender, SBI, reported write-offs of Rs 8,595 crore in the fiscal year 2024, which is significantly lower than the Rs 15,729 crore written off in FY23. In FY22, the bank had recorded write-offs amounting to Rs 12,696 crore.

Union Bank of India also saw a reduction in its write-offs, with Rs 18,264 crore in FY24 compared to Rs 19,175 crore the previous year. Punjab National Bank's write-offs for FY24 were Rs 16,257 crore, a slight decrease from Rs 16,578 crore reported in the last fiscal.

Similarly, Central Bank of India's write-offs dropped to Rs 10,001 crore in FY24 from Rs 10,258 crore in FY23. This trend indicates a modest decline in the amount of non-performing assets being written off by these major banks.

Government & RBI Measures to Address the Challenges of NPAs

SARFAESI ACT

In an effort to address mounting bad loans in Indian banks, the Narasimham Committee on banking reforms identified a problem in 1991: borrowers were obtaining court orders that delayed banks from recovering loans. This led to the establishment of **Debt Recovery Tribunals (DRTs)** in 1993, bypassing the traditional court system for loan recovery. However, by 1998, the Narasimham Committee II felt DRTs needed further legal backing. The solution came in 2002 with the **Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act**. This act empowers lenders to seize and sell secured assets (like mortgaged property) of loan defaulters, expediting the recovery process. It also established **Asset Reconstruction Companies (ARCs)** to manage bad loans. Importantly, SARFAESI does not apply to agricultural loans. Additionally, to discourage frivolous appeals against DRT orders, loan defaulters seeking a stay order must approach DRAT with a 50% deposit of the outstanding dues. Only after exhausting DRAT appeals they can approach the High Court, 50% of the loan dues to discourage frivolous appeals. All type of Commercial and Co-operative Banks, Housing Finance Company and NBFC which has asset size more than 100 crore and which has lent more than 20 crore.

While SARFAESI empowers banks, its limitations become clear with overloaded DRTs and DRATs leading to lengthy delays. This allows borrowers to remain in possession of assets that deteriorate in value. Additionally, the act doesn't allow for loan restructuring, which could yield better returns for banks in specific situations like unique assets with limited buyers. To address these shortcomings, the government introduced a new law: the Insolvency and Bankruptcy Code (IBC).

Insolvency and Bankruptcy (I & B) Code 2016

According to this code National Company Law Tribunal (NCLT) empowered to initiate proceeding under this code for default loan amount more than Rs 1 crore.

This Act mandate NCLT must accept/reject application within 14 days. Within that period an **Insolvency Professional (IP)** will make a resolution plan example: decrease interest, extend loan tenure or IP could also find another investor to finance the pending project. IP will present the plan to committee of creditors (CoC). If CoC agree with such resolution plan, then it will be set in motion, otherwise, IP will liquidate the asset to recover the loan.

This Act allow creditors to appeal against the IP decision to Debt Recovery Appellate Tribunal (DRAT) if borrower is individual or partnership firm and to National Company Law Appellate Tribunal (NCLAT) if borrower is a company. IBC is not applicable to wilful and incapable defaulter.

Corporate Insolvency Resolution Process (CIRP) is formal loan recovery and restructuring process with the help of Insolvency Professional as explained above. It is non confidential process hence it will create bad image on the company in news and media. Hence IBC amended in 2021 to introduce **Pre-packed Insolvency Resolution Process (PIRP)** which allows borrower company to negotiate informally with lenders before approaching IBC. Time limit for PIRP is 120 days which is faster as compared to 330 days for CIRP. Hence PIRP is quick, cost effective and confidential insolvency resolution process prevent bad publicity. Only MSMEs are eligible for PIRP.

Insolvency and Bankruptcy Board of India (IBBI) is the statutory body that monitors and implementation of IBC. IBBI selects Insolvency Professionals Agencies (ICAI, ICSI and Institute of cost Accounting) which enrol and supervise IPs and Information Utility (NeSL).

Cross Border Insolvency

Cross-border insolvency involves recovering debts when a company operating in multiple countries goes bankrupt. Ideally, foreign creditors should be able to claim from an insolvent Indian company's assets, and vice versa. The IBC's sections 234 & 235 aim for this, but remain unenforced, creating uncertainty for creditors and debtors. To address this gap, both the 2018 Insolvency Law Committee and the Economic Survey 2022 recommend a separate law dedicated to handling cross-border insolvency cases.

National Financial Information Registry (NFIR) In Budget - 2023

NFIR will be designed with help of RBI. NFIR will contain information on both individual borrower and company borrowers on all the loans taken by them through banks, NBFCs, bonds, etc. Thus, NFIR Will provide 360 degree information about a loan applicant's creditworthiness. Hence it helps the lenders to process the loan application in a more accurate manner.

Legal Entity Identifier (LEI) Number

Even if a company is blacklisted by Indian banks, it can seek loans abroad where its history might not be known. In response to crises like the Sub-Prime Crisis and the Global Financial Crisis (GFC), the G20, along with its Financial Stability Board (FSB), introduced the Legal Entity Identifier (LEI), a 20-digit alphanumeric code. This LEI serves as a universal identification number akin to an "Aadhar card" for companies, mandatory for all financial transactions globally, overseen by the Global Legal Entity Identifier Foundation (GLEIF) based in Frankfurt, Germany. The Clearing Corporation of India serves as the agent for LEI. Since October 1, 2022, the Reserve Bank of India (RBI) has mandated that companies engaged in cross-border transactions of Rs 50 crore or more must include this LEI number in their financial dealings. The RBI wields the authority to issue such directives under the

Payment and Settlement Systems Act, 2007, and the Banking Regulation Act, 1949

Fugitive Economic Offenders Act, 2018

This legislation aims at apprehending economic offenders accused of crimes such as cheque dishonour, financial scams, and money laundering involving sums exceeding Rs. 100 crores, who have fled India to evade legal action. Special courts empowered by the PMLA will summon the accused within six weeks; failure to comply will result in them being labelled as "Fugitive Economic Offenders." Their domestic and overseas properties, including those held under fictitious names, will be seized. The Union Government will supervise the management or liquidation of these assets once they are confiscated, and ordinary civil courts are barred from issuing stay orders. Appeals can only be made to the High Court and Supreme Court by the offenders.

Bad Banks

The Economic Survey of 2016-17 highlighted that around Rs. 2 lakh crore of bank funds were tied up in large non-performing assets (NPAs), with each account holding Rs. 500 crore or more. Resolving such large NPAs, particularly those involving wilful defaulters like Vijay Mallya, proved challenging under the Insolvency and Bankruptcy Code (IBC). While the SARFAESI Act allows for the auction of such assets, sometimes potential buyers and Asset Reconstruction Companies (ARCs), such as Anil Ambani's, lack the financial capacity to acquire such significant assets worth hundreds of crores. To address this issue, the 2016-17 Economic Survey recommended establishing a "bad bank" to purchase these bad loans from banks, aiming to maximize value through loan restructuring, liquidation, or auction and absorbing the associated losses. Subsequently, the Budget of 2021 introduced plans to establish an Asset Reconstruction Company (ARC) and Asset Management Company (AMC) to take over these distressed loans from banks. The government clarified that it would not hold any stake in the ARC or AMC, and banks would fund their establishment independently. The National Asset Reconstruction Company (NARC) acts as the ARC, acquiring bad loan assets from banks, while the India Debt Resolution Company Ltd (IDRCL) functions as the AMC, managing, enhancing value, and auctioning off the bad loan assets acquired by NARCL.

Prompt Corrective Action (PCA) Framework

Under the PCA framework (Qualitative monetary policy, the Reserve Bank of India) categorizes scheduled commercial banks (SCBs) into risk thresholds #1, #2, and #3 based on factors like capital adequacy and loan-asset quality. The higher the threshold number, the greater the risk, prompting the RBI to implement corrective measures. These measures include issuing strict warnings, conducting deeper audits and supervision, restricting directors' salaries and dividend distribution, limiting branch expansion and lending operations, and in extreme cases, enforcing merger or shutdown under the Banking Regulation Act 1949. SCBs listed under PCA seeking to be "whitelisted" must reduce their non-performing assets (NPAs), secure additional capital, and enhance profitability.

Basel-III Norms

The Bank for International Settlements (BIS) is a global institution headquartered in Basel, Switzerland, comprising 60 central banks. Its banking supervision committee established norms in 1988 (I), 2004 (II), and 2011 (III) to ensure worldwide financial stability. Starting April 1, 2013, the Reserve Bank of India (RBI) initiated the phased implementation of BASEL III norms in India. Under these norms, Universal Scheduled Commercial Banks (SCBs) are required to maintain a minimum Capital to Risk Weighted Assets Ratio (CRAR) of 9%. As non-performing assets (NPAs) rise, a bank's asset quality deteriorates, leading to an increase in its Risk-Weighted Assets (RWA). Consequently, the bank must procure additional capital to meet these ratios, norms, and buffers. Failure to comply with BASEL norms can result in the RBI placing the bank on the Prompt Corrective Action (PCA) list. In extreme cases, the bank may need to merge, sell its business to another bank, or cease operations.

D-SIB: Domestic Systemic Important Banks.

In 2010, the Financial Stability Board, a creation of the G-20 and headquartered in Basel, urged nations to pinpoint Systemically Important Financial Institutions and establish frameworks to mitigate risks within them.

Annually, the Reserve Bank of India identifies banks deemed "too big to fail," designating them as Domestic Systemically Important Banks (D-SIBs) and mandates they maintain additional equity capital against their Risk-Weighted Assets (RWAs) along with other technical requirements. Currently, India boasts three D-SIBs:

State Bank of India (SBI), ICICI Bank, and HDFC Bank.

Recapitalization of PSBs.

In response to the need for compliance with BASEL-III norms, banks lacking capital can resort to issuing debt and equity. Public Sector Banks (PSBs) were projected to require Rs. 1.8 lakh crore by 31/3/19, prompting the Indradhanush Plan to recapitalize them with Rs. 70,000 crores from 2015 to 2018, based on performance outcomes. However, by 2017, it was evident that Rs. 70,000 crores fell short for BASEL-III compliance. To address this shortfall, the Modi Government announced additional funds and initiated the issuance of Bank Recapitalization Bonds (RcB) in the market. These bonds carried an interest rate of around 7% and matured between 2028 and 2033, but they were non-transferable to third parties and non-convertible into shares.

The government also directed PSBs to raise equity capital from private investors, although smaller banks with weak balance sheets encountered reluctance from investors. Consequently, Bharatiya Mahila Bank (BMB) and five Associated Banks merged with the State Bank of India (SBI) in 2017, followed by the merger of Vijaya Bank and Dena Bank with Bank of Baroda in 2019. In the budget announcements of 2020 and 2021, Rs. 3.50 lakh crore and Rs. 20,000 crores, respectively, were allocated for PSB recapitalization in the financial year 2021-2022. However, in the 2022 budget, no funds were earmarked for this purpose, as the government argued that PSBs' profitability had improved, enabling them to address their capitalization issues independently by issuing shares and bonds in the market.

Conclusion

In conclusion, NPAs in India has gradually declining since 2018, still existing NPAs have emerged as a significant threat to Indian banks' financial health.

While the SARFAESI Act empowered banks for asset seizure, limitations like overloaded tribunals and a lack of restructuring options hindered its effectiveness. The IBC's introduction streamlined insolvency processes and allowed restructuring, leading to a decrease in NPAs. However, the absence of a robust framework for cross-border insolvency creates uncertainty. The establishment of NARC, a "bad bank," promises to further reduce NPAs by acquiring and resolving bad loans. Implementation of BASEL III norms in India have provided frameworks to the RBI to keep the commercial banks more resilient against risk weighted assets. By implementing these combined efforts, India can effectively tackle the NPA challenge and ensure a stronger banking sector.

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Green Banking In India: A Study on Adoption by Indian Banks

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Abstract

The banking sector is crucial in promoting sustainable development and mitigating environmental degradation. Green banking is an approach that focuses on reducing the environmental impact of banking operations and fostering sustainable development. This involves adopting environmentally friendly practices such as energy-efficient buildings, e-banking, and sustainable lending practices. By implementing these practices, banks can significantly reduce their energy consumption, water usage, and waste generation, contributing to a more sustainable future. Additionally, green banking encourages banks to support environmentally friendly projects through sustainable lending and investments, further promoting sustainable development. The study combines a review of existing literature with a survey of Indian banks to assess the adoption of green banking practices. The findings indicate that while Indian banks have made notable progress in integrating green banking, there is still a need for enhanced awareness, capacity building, and stronger regulatory support. The report offers recommendations for Indian banks, policymakers, and regulators to further encourage the widespread adoption of green banking practices in India.

Key words: *Green Banking, Sustainable Development, Sustainable Lending and Investments, Adoption of Green Banking Practices, Awareness.*

Introduction

The banking sector is crucial for driving economic growth and development. However, its operations also have a considerable environmental impact, contributing to climate change, pollution, and resource depletion. In response to these concerns, there has been an increasing acknowledgment of the importance for banks to adopt environmentally sustainable practices, referred to as green banking. Green banking includes the integration of eco-friendly practices in banking operations, such as energy-efficient buildings, e-banking solutions, and sustainable lending strategies.

As one of the fastest-growing economies globally, India plays a crucial role in fostering sustainable development. The Indian banking sector, in particular, has been a leader in adopting green banking practices. In 2012, the Reserve Bank of India (RBI) introduced guidelines on green banking, urging banks to implement environmentally sustainable practices.

This study examines the adoption of green banking practices by Indian banks. It provides an overview of the current status of green banking in India, outlining the initiatives implemented by banks to embrace sustainable practices. Additionally, the report highlights the challenges faced by Indian banks in adopting green banking and offers recommendations to encourage broader adoption of these practices across the sector.

Literature Review

Based on the literature review, the study "Green Banking in India: A Study of the Current Status and Future Prospects" by Kumar et al. (2018) assesses the present state of green banking in India and explores potential future growth opportunities. The review highlights that while Indian banks have made considerable advancements in adopting green banking practices, challenges remain, particularly in terms of raising awareness and enhancing capacity building efforts within the sector.

A study done by Singh et al. (2019), reviews the existing literature on green banking initiatives in India, identifying key trends and challenges. The findings indicate that Indian banks have introduced various green banking initiatives, such as energy-efficient buildings and sustainable lending practices.

The study titled "Assessing the Environmental Performance of Indian Banks: A Study of Green Banking Practices" by Sharma et al. (2020) evaluates the environmental performance of banks in India and explores their implementation of green banking practices. The findings highlight that while Indian banks have made notable advancements in minimizing their environmental impact, there remains a need for enhanced transparency and reporting in this area.

The study "Green Banking and Sustainability: A Study of Indian Banks" by Jain et al. (2017) explores the connection between green banking and sustainability within the Indian banking sector. The research reveals that the adoption of green banking practices has a positive impact on sustainability performance.

The study "Adoption of Green Banking Practices in India: A Study of the Factors Influencing Adoption" by Kumar et al. (2019) investigates the factors that influence the adoption of green banking practices in India. The findings indicate that regulatory pressures, customer demand, and the pursuit of competitive advantage are the primary drivers behind the adoption of green banking practices.

The study "Green Banking in India: A Study of the Current Status and Challenges" by Singh et al. (2018) assesses the current state of green banking in India and highlights the key challenges faced. The findings reveal that Indian banks encounter obstacles in adopting green banking practices, such as limited awareness and high implementation costs.

The study "Sustainability Reporting in Indian Banks: A Study of Green Banking Practices" by Sharma et al. (2019) explores sustainability reporting in Indian banks and the adoption of green banking practices. The findings suggest that while Indian banks have made progress in enhancing their sustainability reporting, there is still a need for more transparent and comprehensive disclosures.

The study "Green Banking and Risk Management: A Study of Indian Banks" by Jain et al. (2018) explores the connection between green banking and risk management within the Indian banking sector. The findings indicate that the adoption of green banking practices is positively linked to improved risk management performance.

The study "Adoption of Green Banking Practices in India: A Study of the Role of Regulatory Bodies" by Kumar et al. (2020) investigates the role of regulatory bodies in encouraging the adoption of green banking practices in India. The findings highlight that regulatory bodies have been instrumental in promoting green banking, but there is a continued need for more effective regulation and oversight.

The study "Green Banking in India: A Study of the Current Status and Future Directions" by Singh et al. (2020) evaluates the current state of green banking in India and outlines potential directions for future growth. The findings suggest that while Indian banks have made considerable progress in adopting green banking practices, there is still a need for greater awareness, capacity building, and enhanced regulatory support.

Green Banking Initiatives in India

Green banking has become a key priority for Indian banks. Recently, the World Bank announced a \$1.5 billion funding initiative to support India in developing energy from low-carbon sources. The World Bank envisions India fostering a dynamic green hydrogen market, accelerating the growth of renewable energy, and stimulating investments in low-carbon energy. As the fastest-growing major economy, India is expected to continue its rapid economic expansion. However, the World Bank emphasizes that decoupling economic growth from emissions growth will require scaling up renewable energy, particularly in hard-to-decarbonize industrial sectors. This effort will necessitate an accelerated development of climate finance to enhance the mobilization of funds for low-carbon investments.

Challenges and Opportunities in Green Banking

Indian banks encounter various challenges in adopting green banking practices, such as limited awareness, high implementation costs, and regulatory obstacles. Despite these challenges, there are significant opportunities for growth and development in the green banking sector. The Indian government has introduced several initiatives to encourage green banking, including offering tax incentives and subsidies.

Regulatory Framework for Green Banking in India

The Indian government has implemented various regulations to promote green banking in the country. The Reserve Bank of India (RBI) has issued guidelines to encourage banks to adopt environmentally sustainable practices. Additionally, the RBI has introduced a green banking policy that offers a structured framework for banks to implement green banking initiatives.

International Best Practices in Green Banking

Several countries have implemented regulations and guidelines to foster green banking. For instance, the European Union has introduced a green banking directive that mandates banks to disclose their environmental impact. Similarly, the United States has

enacted regulations to support green banking, including the Dodd-Frank Wall Street Reform and Consumer Protection Act.

Green Deposits

Axis Bank has recently launched a unique green initiative called the Green Deposit. This initiative is aimed at individuals who want their funds to support environmentally sustainable projects. The bank will allocate the money specifically for initiatives such as renewable energy, clean transportation, pollution control, green construction, and efficient water management systems. The Green Deposits are available to any customer who wishes to contribute to sustainable development through environmentally friendly efforts. Additionally, the bank is offering competitive interest rates to attract these depositors.

As global awareness of ecological and climate-related issues continues to grow, banks are preparing to play a crucial role in addressing these challenges. In the near future, they may begin integrating environmentally-friendly practices, such as reducing carbon footprints, into core processes like lending and accepting deposits. Banks are also recognizing that the greening of industries can enhance asset quality. Moreover, by promoting green initiatives, banks not only attract capital investment but also understand the benefits of waste management and pollution control.

Case Studies

State Bank of India

State Bank of India (SBI), one of the largest banks in India, has implemented several initiatives to promote green banking. These include energy-efficient buildings, sustainable lending practices, and the adoption of e-banking solutions. SBI has also introduced a green banking policy that offers a structured framework for the bank to integrate environmentally friendly practices into its operations.

ICICI Bank

ICICI Bank, one of the largest private sector banks in India, has implemented several initiatives to promote green banking. These initiatives include energy-

efficient buildings, sustainable lending practices, and e-banking solutions. Additionally, ICICI Bank has introduced a green banking policy that provides a structured framework for the adoption of environmentally friendly practices across its operations.

Conclusion

In conclusion, the adoption of green banking practices by Indian banks is a vital step towards minimizing the environmental impact of banking operations and fostering sustainable development in India. The study emphasizes the significance of green banking in reducing energy consumption, water usage, and waste generation, while also highlighting various initiatives undertaken by Indian banks to implement these practices.

However, the study also identifies several challenges, including limited awareness, high costs, and regulatory obstacles, that hinder the widespread adoption of green banking. To address these challenges, it is crucial for Indian banks to focus on raising awareness and building capacity, while regulatory bodies should offer support and incentives to encourage the adoption of green banking practices.

Ultimately, embracing green banking has the potential to create a more sustainable future for India. It is essential for all stakeholders to collaborate and promote green banking practices across the country.

Recommendations

- Indian banks should enhance awareness and strengthen capacity-building efforts to drive the adoption of green banking practices.
- Regulatory authorities should provide support and incentives to encourage the implementation of green banking initiatives.
- Indian banks should embrace sustainable lending practices and invest in projects that promote environmental sustainability.

- Banks should promote e-banking and digital banking solutions to reduce paper consumption and lower energy usage.

By following these recommendations, Indian banks can minimize their environmental footprint, foster sustainable development, and contribute to a more sustainable future for India.

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Cash Management System: A Study with reference to Oman Oil Marketing Co SAOC, OOMCO

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Introduction

Oman Oil Marketing Co SAOG (Omanoil), a subsidiary of Oman Oil Company SAOC, is an Oman-based publicly listed joint stock company engaged in the marketing and distribution of petroleum products. The Company is active in three segments: Retail business, Commercial business, and other businesses. The Company is involved in the marketing and distribution of fuel and lubricant products operating in the sectors of fuel retailing, direct fuel sales to government and commercial sectors, lubricant marketing, aviation refueling, storage and distribution. The Company's Aviation business unit supplies jet fuel at Muscat International Airport. The Company operates a network of 236 retail stations across the Sultanate of Oman. The Company also provides fuel cards including Ejaba and Basma cards. Importance of Cash Management: A company with a functioning cash management system works with all of its internal stakeholders, which are typically financial officers, treasurers, or business managers. They plan around the cash flow statement, which is a thorough record of all inbound and outgoing transactions, as well as cash spent on investments. The primary goal of the cash flow statement is to show the cash that is currently available for the business to use. Every organization, regardless of size, must have some level of cash management expertise, as it is an important component of financial security. Money is constantly moving in and out of a business account, but more must come in so that the balance does not diminish. Cash management is the monitoring and maintenance of cash flow to ensure that a business has sufficient

capital to operate. Investments, bill payments, and unforeseen liabilities can all have an impact on a company's cash management, as well as its inflows and outflows. To operate independently, businesses must design a structure that optimizes liquid assets while lowering outgoing operational and logistical costs. In other words, cash management enables businesses to ensure that their cash flow meets their financial obligations. Cash management depends on a company's cash flow, or the money that goes in and out of a business. Cash flow refers to the money movement cycle through bank accounts. It depends on the clients that are paying a business for a service or a product and the expenses paid to keep the business running.

Keywords: *Cash Management, Cash Ratio, Cash Inflow & Cash Outflow*

Research problem and objectives of the study

Notwithstanding the vital significance of proficient cash administration in guaranteeing fiscal stability and bolstering operational efficacy, a thorough comprehension of Oman Oil Marketing's (OOMCO) cash management methodologies remains incomplete. This study attempts to close this gap by examining OOMCO's existing cash management system, highlighting significant obstacles and possibilities, and making suggestions for improving cash management efficacy within the framework of Oman's oil marketing sector. The study framed research questions such as:

- 1 What are the techniques of cash management, how does the cash management influence the OOMCO, how does the cash flow statement influence the performance of OOMCO?

2 What are the effective measures in cash management to stabilize OOMCO liquidity position?

It also framed the objectives as :

- 1 To identify the key challenges and bottlenecks in OOMCO cash management system.
- 2 To examine OOMCO cash management system and analyze its effectiveness in managing cash inflows and outflows.
- 3 To evaluate the impact of OOMCO cash management system on the overall financial performance and stability of the organization.
- 4 To analyze the effectiveness of cash management in OOMCO (cash ratio, cash to working capital ratio, debt equity ratio, growth of cash position ratio, cash to current asset ratio, net profit ratio and cash to sales).
5. To suggest measures for effective cash management of OOMCO.

Significance of the Study

Providing Sufficient Cash Liquidity: OOMCO cash management program makes sure that there is enough cash on hand to pay debts on time. This calls for careful planning to meet the company's financial demands as well as tracking and evaluating cash inflows and outflows. **Financial Risk Management:** In order to effectively manage and reduce the financial risks connected to cash, cash management is essential. These hazards consist of unanticipated cash flow concerns, interest rate variations, and exchange rate volatility. Through a thorough analysis and evaluation of these risks, as well as the implementation of suitable policies, OOMCO can mitigate financial risks and preserve its financial stability. **Increasing Financial Efficiency:** Good cash management contributes to OOMCO increased financial efficiency. Through attaining an appropriate equilibrium between cash inflows and outflows and improving liquidity management, the organization can lower borrowing costs and increase returns on short-term investments. **Encouraging Investment and growth:** OOMCO can

better finance investment and growth projects when it has sound cash management. Through efficient cash flow management and provision of essential financial liquidity, the organization can attain growth and expansion, as well as leverage investment opportunities within the oil and gas industry. OOMCO cash management is essential to maintaining the company's financial stability and achieving its strategic and financial goals.

Literature Review

In recent years, cash has been considered the lifeblood of business. It became required to obtain resources, equipment, supplies and additional resources that go into producing the goods and services the company offers (Department, 2009). For this, effective cash management has become essential for organizations to preserve monetary stability and provide liquidity, especially in the fast-paced, fiercely competitive commercial world of today. According to the report published by the Association for Financial Professionals (AFP), in 2020, cash equivalents made up around 13% of all the assets owned by non-financial corporations in the United States (Mungal, 2014). In this sense corporations start to various types of cash management techniques to efficiently manage accounts payable, inventory levels, and receivables to maximize cash inflows and outflows. Conversely, organizations frequently use several cash budgeting strategies to guarantee efficient cash management. Incremental budgeting in this method entails forecasting future cash flows using historical data as a baseline (Maryory, 2023). The prime benefit of utilization of incremental budgeting in most of the corporations is because of simplicity and ease of use as it expands upon current budgetary estimates and necessitates the least amount of planning time and resources. However, some scholars point out that unexpected events or changes in outside circumstances might not be sufficiently considered by incremental budgeting, potentially leading to missed chances for cost reductions or inefficiencies in the budget. Despite these restrictions, because it is an age-

old technique which performs smoothly incremental budgeting is still a popular budgeting approach in many firms (Badakhshan, 2022). Second, Zero-Based Budgeting (ZBB) is an approach of budgeting where each financial cycle begins at zero and all costs must be justified from the starting point up, demands all costs, even those that were included in earlier budgets, to be completely justified. In contrast to conventional budgeting techniques, which usually begin with the budget for the month preceding and make small amendments, ZBB requests that executives assess each expense as though it were brand-new and necessary to meet company objectives. Moreover, managers are required by ZBB to justify every expense by demonstrating its need.

On the other hand, Activity-Based Budgeting (ABB) is an approach of allocating that divides funds among multiple divisions or business units according to projected activity levels. ABB is concentrated on determining and ranking tasks that directly support company goals, financial allocations under ABB are based on the projected amount and cost of activities needed to support the company's operations (Department, 2009). This method entails examining the factors that influence costs and the resources needed for each task such as customer service, marketing, and production. Hence, organizations may increase overall operational effectiveness, maximize cost-efficiency, and allocate resources more wisely when they use ABB to match budget allocations with activity levels and performance expectations (Mungal, 2014).

Research has indicated that companies with inadequate cash management practices are more likely to fail, and that companies with well-organized working capital management outperform their competitors financially (Makina, 2021) and also, experts confirm that executives may ultimately improve a company's profitability (financial performance) by enhancing the Cash Management elements that fall under their purview. Thus, managing working capital is an effort to regulate and handle the present state of assets and liabilities to maximize profitability and provide

appropriate liquidity levels for the company. A study (Usman, 2017) investigated the cash management impact on companies determined that it accounts for between 30% and 40% of the stability of an organization. Thus, the financial performance of commercial firms and the features of cash management are strongly correlated, in line with other comparable literature (Kitomo, 2021). According to Usman (2017), effective handling of cash has a big impact on the well-being and stability of finance in a variety of different businesses and sectors. Through, efficient cash inflow and outflow management, businesses can improve liquidity, reduce risk, and strengthen their financial resilience, which enable that there are enough funds accessible to fulfil their immediate responsibilities and take advantage of new opportunities (Badakhshan, 2022). In addition, through the implementation of appropriate hedging techniques, diversification of cash holdings, and maintenance of sufficient reserves, cash management helps alleviate a range of financial risks, including fluctuations in the markets, risk of default, and operational difficulties. It helps companies to achieve optimal financial management by optimizing payables, receivables, and inventory levels, enabling them to maintain both profitability and liquidity. This can also in turn to lowers borrowing costs, boosts the effectiveness of cash flow, and increases the financial system as a whole (Washington, 2022). (Maryory, 2023) It is stated that acceptable cash management enables wise capital allocation choices simpler, allowing businesses to match capital expenditures with strategic goals and give priority to initiatives with good risk-return profile. Moreover, organizations that have a strong cash management structure are better equipped to handle financial downturns, capitalize on possibilities for expansion, and adjust to shifting market conditions (Ramli, 2022). On the other hand, Moracci (2022) claimed that Effective cash management procedures should be prioritized by companies aiming to prosper in the fast-paced business world of today, as they support sustainable growth, financial flexibility, and flexibility across a variety of industries.

Effectively sustain operational activities, meet strategic goals, and preserve financial stability are all essential needs that companies must practice achieving effective cash management. OOMCO's cash management plays an essential part in the expansion and management of the country's energy funds through several sectors, includes petrochemicals, renewable energy, oil and gas exploration, and refining (Organisation, 2022). According to the company's analysed reports stating that because of the company's wide range of businesses and varied portfolio, it encounters various challenges in administration of its cash flows. Volatility in oil prices has become the first challenge for the company, where the cash flows can be significantly impacted by changes in oil prices, these downturns cause revenue streams to directly decline, therefore limiting the company's ability to produce cash and meet its financial commitments. Second, Project investment intensity energy projects, including discovery, manufacturing, and refining, combine the trait of requiring large initial investments along with long payback times (Washington, 2022). Considering the sheer magnitude of these endeavours, significant initial financial resources are required, presenting serious difficulties for cash flow management. Furthermore, OOMCO's vast operations are spread across several nations, each having a different currency, which exposes the business to currency conversion risk. Changes in currency rates can have a significant impact on several different aspects of the financial picture of the organization, modifications to currency exchange rates can have an immediate effect on OOMCO's cash holdings, which could lead to variations in the company's total liquidity position. In addition to that, changes in the exchange rate can lead to large changes in the value of the company's debt commitments, which are frequently expressed in foreign currencies (SAQIB, 2017). This can have an influence on the company's ability to service its debt. Also, asserted foreign operations sources of income could be vulnerable to exchange risk because changes in exchange rates have the potential to increase or decrease the number of profits earned in foreign

currencies when converted to the currency used for reporting of the company's accounts. Furthermore, adherence to standards for financial reporting and laws and regulations is essential, where regulations strictly and paying close attention to details are essential. (SAQIB, 2017) It is asserted that OOMCO is allocating more resources and stepping up managerial efforts to successfully fulfil these strict regulatory duties.

Digital Tools and Technologies in Cash Management

Cash management is described as a process of managing, collecting and track a company's cash inflows and outflows. Thus, it is vital for preserving profitability, liquidity, and growth. Nevertheless, managing cash may also be difficult, error-prone, and time-consuming (Avira, 2023). For this, organizations utilize technology to make forecasting and financial management more efficient. According to the Milojeviæ (2014), the implementation of Cash management tools can streamline and increase the company's process. Hence, it is impossible to overestimate the impact of digital tools and technology on contemporary cash management procedures, however research has identified several instruments that businesses in the industry use. (Wielage, 2018) Various types of cash management, first, PlanGura highlighted that PlanGura is a digitalized cash management which provides business owners with forecasting and budget tools, Entrepreneurs can delve deeply into intricate financial data thanks to its analytical tools. PlanGura create projections and budgets for up to ten years in the future, where using this tool, businesses may modify their assumptions and forecast potential outcomes for their financial condition, allowing them to better manage their cash flow. On the other hand, (Kumar, 2022) it is pointed out the benefits of Float stated that is an app and program for cash flow management that has won awards, through utilizing this software organisations can make adjustments to examine how it would alter in various situations, such as an increase in material costs. Also, through the Float company can link Float account to popular small company accounting

programs like Xero and QuickBooks. Float then updates its estimates for the cash-flow management of the organization in accordance with the tracking and recording of fresh data from accountancy software. Aderin (2022) shed light on the Scorio cash management tool, asserted that if the organizations seek a more all-encompassing instrument, Scorio is the best select. It is a software can handle a wide range of other corporate functions, where among its more than 100 features are managing projects, vendor administration, sales pipeline following, and billing. QuickBooks are another type of cash management tools, where it is one of the most widely used accounting software globally, it involves a simple cash-flow management instrument. Through the adoption of this tool's businesses can project their cash flow and budget for up to ninety days ahead of time. It can also manage pay bills, invoices and generate financial reports. However, QuickBooks is a handy tool for managing cash flow if the firm already uses the program for financial management, even though it might not be as effective as other solutions (Jackson, 2022).

Research Methodology

In this research, a convenient sampling method is adopted to choose the applicants from OOMCO, which is considered a popular gas and oil business in Oman. The analysis of five-year financial statements relating to the cash flow management of Oman Oil Company are analyzed. This can offer a comprehensive understanding of the cash flow management of the company, shedding light on the patterns, areas of weakness, and strengths. This research are based on secondary data, where thorough depth search terms and the utilization of Google-scholar search engine a compiled list of peer-reviewed journal publications and sources. The search method was controlled by terms that were cash management, financial stability, cash flow, and OOMCO. Moreover, the analysis of the publications was according to the relevance of the study with the research area. In addition to that, according to the obtained titles Google Scholar allows

access to a list of more specialized papers when using ProQuest, Since Direct, and the Oman Virtual Science Library (Masader). To find narrower results, the college library has been used. Data analysis is a vital component of any research study, thus, to get accurate and impartial results, the gathered data are analyzed reasonably. In this study, an Excel sheet is utilized to analyze the records of acquired reports through charts which it offers an effective and adaptable method for data analysis that helps investigators obtain significant insights and effectively convey results (Kitomo, 2021). Next, cash ratio with metrics such as debt-equity ratio and cash-to-working capital to measure several aspects of a company's financial health are calculated. A thorough understanding of liquidity, operational effectiveness, and financial leverage can be obtained by evaluating these ratios.

Data Analysis and Discussion

These fluctuations highlight the significance of keeping a careful eye on the business's operational dynamics, responding to shifts in the market, and putting into practice sensible plans to maintain cash flow and improve the company's long-term financial health. The results of net cash-provided investment activities evident that OOMCO has experienced alterations representing varying degrees of strategic focus and investment participation. In 2018, the company made a significant investment of OMR 6,743,023 to demonstrate its devotion to future growth and growth. But in 2019, there was a significant decline to OMR 1,339,492, indicating a possible reduction in investment activities, perhaps as a reaction to economic uncertainty or a re-evaluation of strategic goals. In 2020, the trend reversed and saw a significant increase signifying a renewed focus on strategic expenditures to drive growth and improve competitive posture. These variations highlight the fluidity of OOMCO investment choices as well as the value of strategic adaptability in response to changing organizational requirements and market conditions. The OOMCO's cash flow financing activities ratio resulted in financing that there is a shift in the

company's financing approach implying a large inflow of funds. In 2018 the company recorded a positive cash flow from financing operation of OMR 24,925,533, indicating a sizable inflow of funds. On the other hand, the company's negative cash flow for 2019 was OMR 7,872,958, which indicates a net outflow of capital from financing operations. This could refer to debt repayments, repurchases of shares, or dividend payments that are greater than the amount of fresh capital raised each year. Showing again an increase in the in 2020 which this indicates a change in the company's financial restrictions.

Conclusion and Recommendations

The main research question highlighted in this project is to examine the OOMCO cash management system and analyze its effectiveness in managing cash inflows and outflows, discover the challenges, and analyze the effectiveness of cash management in OOMCO. In addition to that, the study covers the impact of OOMCO cash management system on the overall financial performance and stability of the organization. In the academic aspect, this project would contribute to the literature on cash management systems by offering valuable insights into challenges, strategies, and practices provided by the company. The results may be utilized by scholars in the fields of finance, accounting, and business administration to enhance existing theoretical frameworks and create fresh approaches to cash management in the oil marketing sector. On the practical aspects of the project, the management team and financial experts at OOMCO may find the research to be quite insightful. Through an evaluation of the efficacy of its extant cash management system and the identification of potential areas for enhancement, OOMCO can institute focused tactics aimed at augmenting liquidity, refining cash flow, and alleviating financial hazards.

The future line of this research aims to perform a comparative study of the cash management systems of various oil marketing firms in Oman or the surrounding area. This comparison analysis could

reveal common patterns, variations, and best practices in cash management techniques, offering legislators and business professionals' insightful information. The members of this research faced several challenges in the compilation of this project where the restricted availability of extensive financial data and internal firm information limited the breadth of the investigation and applicability of the conclusions. Thus, Access to sensitive data on OOMCO's cash management processes is restricted for academics due to confidentiality agreements or proprietary issues. This has an impact on the analysis's level of detail and its capacity to corroborate the results of reports.

The following suggestions can be made in light of the investigation of Oman Oil Marketing's (OOMCO) cash management system: Make an investment to raise the precision and dependability of financial forecasting techniques. To predict money inflows and outflows, sophisticated data analysis and models of forecasting that consider seasonal changes, market movements, and economic situations better accurately. Implement techniques to increase liquidity and manage working capital more effectively. To free up cash, this can entail negotiating advantageous payment terms with suppliers, cutting back on the expense of keeping inventory on hand, and quickening the collection of accounts receivable. Adopt technological solutions to improve cash operations, decrease human mistakes, and simplify processes such as e-payment platforms, automated cash management systems, and Treasury oversight software. Increasing of COGS will lead currently to reduce the revenue however this is a strategic concept in order to increase their revenue after 5 years. The cash inflow was reduced and that is normal due to the difference type of method of payments like Visa and other company card to be provided to their customer.

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A Study on "Digital Payment Systems: Emerging Trends and their Impact on Consumer Behavior in the Banking Sector of Thane District, Maharashtra"

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Abstract

The study is on the adoption and impact of emerging digital payment systems on consumer behavior in the banking sector of Thane district, Maharashtra. With the emergence of digital payments, including mobile wallets, UPI, and contactless payments, the interaction of consumers with banks has changed. This paper analyses the trends in digital payment adoption, consumer preferences, and the challenges faced by users, based on insights drawn from a survey conducted among residents of Thane district. The findings are aimed at offering recommendations for improving digital payment adoption and customer satisfaction.

Keywords *Digital Payment Systems, Consumer Behavior, Banking Sector, Thane District, Emerging Trends, Consumer Preferences.*

Introduction & Background of the Study

Digital payments are transforming the banking scenario of India, mainly with UPI, mobile wallets, and contactless payments. The Thane district presents a unique case in which there is an amalgamation of urban and rural consumers that can be studied to see the behavior of consumers regarding digital payments.

Research Problem

Though digital payment systems are becoming popular, its adoption and impact on consumer behavior in Thane district are unexplored. This research would bridge the gap and understand emerging trends in digital payments, challenges, and consumer responses in this region.

Objectives of the Study

1. To examine new trends of digital payment systems in the Thane district.
2. To study consumer behavior, or the impact of adopting digital payments across banking.

Literature Review

1. *Trends in Digital Payment Systems*

Emerging trends include the integration of artificial intelligence (AI), blockchain, and machine learning in payment gateways, ensuring better fraud detection and personalized user experiences. Studies such as Gupta and Sharma (2022) have highlighted the shift towards contactless payments, driven by the COVID-19 pandemic, which accelerated the adoption of technologies like NFC (Near Field Communication) and QR code-based payments. Additionally, the introduction of government initiatives such as India's Digital India campaign has further promoted the adoption of digital payments.

2. *Consumer Behavior in the Digital Era*

Consumer behavior in the context of digital payments is influenced by factors such as trust, ease of use, perceived usefulness, and security. Venkatesh et al. (2020) discuss the Technology Acceptance Model (TAM), which explains how these factors affect the adoption of new technologies. Furthermore, demographic variables such as age, income, and education significantly impact digital payment usage. Studies reveal that younger consumers are more likely to

adopt innovative payment methods compared to older demographics.

3. *Impact on the Banking Sector*

The banking sector has witnessed significant changes due to the rise of digital payments. It has enabled banks to enhance their customer service through mobile banking apps and digital wallets. According to a report by the Reserve Bank of India (RBI) (2023), digital payments have contributed to improved financial inclusion, especially in semi-urban and rural areas. However, challenges such as cybersecurity threats, operational risks, and the digital divide remain pertinent issues.

4. *Regional Focus: Thane District*

Thane district, being a part of the Mumbai metropolitan region, exhibits a blend of urban and semi-urban characteristics. Studies focused on this region, such as those by Patil et al. (2021), highlight a rapid increase in digital payment adoption among businesses and individuals. The availability of internet connectivity and smartphone penetration has played a crucial role in this transformation. However, there is a need for further research on the impact of these systems on consumer behavior, particularly in understanding satisfaction, loyalty, and perceived security concerns.

Research Gaps

While significant progress has been made in understanding digital payment systems, gaps remain in exploring specific regional dynamics and consumer preferences. For instance:

- Limited studies focus on the behavioral patterns of consumers in semi-urban areas.
- The role of digital literacy in fostering the adoption of digital payments needs further exploration.
- Research on long-term consumer trust in digital payment systems and their sustainability is lacking.

Research Methodology

Sample Size	100 respondents (random sampling) both urban and rural areas of the district.
Sampling Method	Stratified random sampling
Research Design	Descriptive research design
Geographical Area	Residents of Thane district.
Data Collection	Primary Method - Structured questionnaire Secondary Method - Books Journals, Articles, Websites.
Diagram presented	Pie-diagram

Data Analysis & Interpretation

Table No.1 Gender Wise Classification of Respondents

Gender	Percentage of Respondents (%)
Male	55
Female	45
Total	100

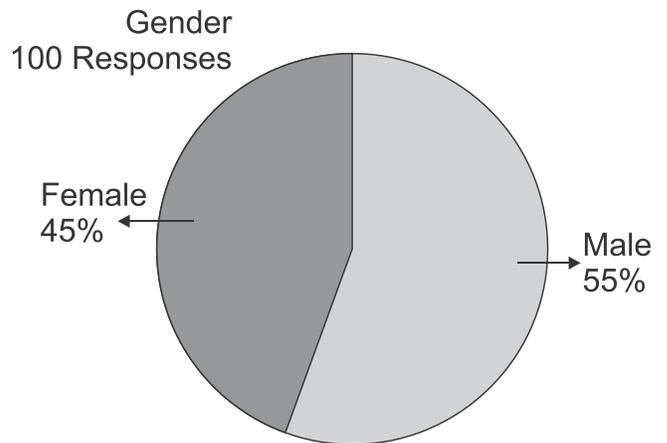


Chart No.1

Interpretation: The above table and chart showing gender wise classification of respondents. Among 100 respondents, 55% of respondents are belonging to male category and 45% of them are belonging to female category.

Table No.2. Income Wise Classification of Respondents

Levels of Income	Percentage of Respondents (%)
Below Rs 20,000	20
Rs 20,000-50,000	30
Above Rs 50,000	50
Total	100

**Income Level
100 Responses**

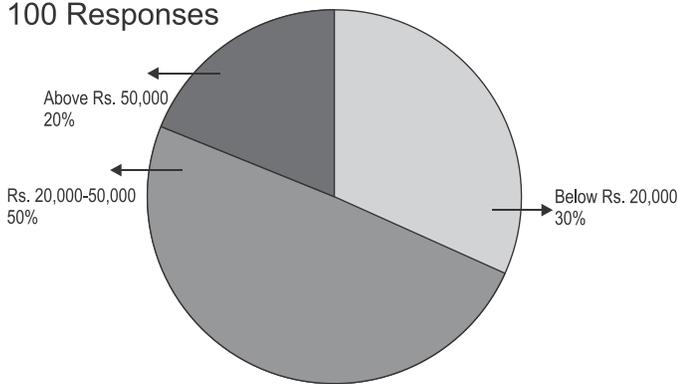


Chart No. 2

Interpretation: The above table and chart show the income level classification of respondents. 30% of respondents are having below Rs 20,000, 30% of respondents' falls in Rs 20,000-50,000 income level category and remaining 20% respondents are belonging to above Rs 50,000 income level.

Table No.3. Digital Payments Usage

Category	Percentage of Respondents (%)
Credit Cards/ Debit Cards	24.2
UPI	42.4
Mobile Wallets (Like Paytm)	33.3
Total	100

**Digital Payment Usage :
100 Responses**

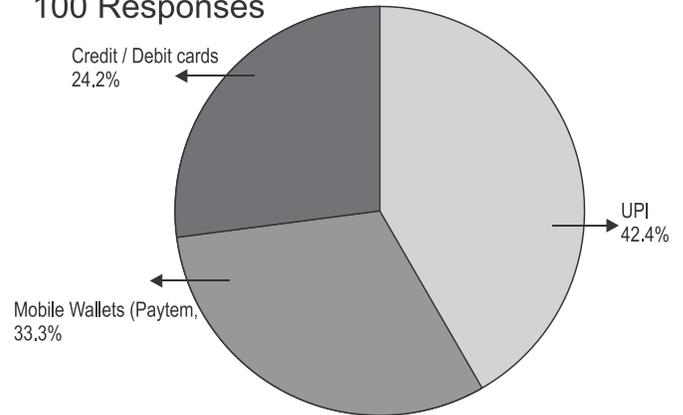


Chart No 3

Interpretation: From the above table and chart, we can interpret that 24.2 % of respondents are using either credits cards or debits cards for digital payments.42.4% of respondents are making payments using UPI and 33.3% of respondents are opting for mobile wallets such as paytm.

Table No.4 Frequency of. Digital Payments Usage

Category	Percentage of Respondents (%)
Monthly	15
Daily	25
Weekly	60
Total	100

**Frequency of Usage :
100 Responses**

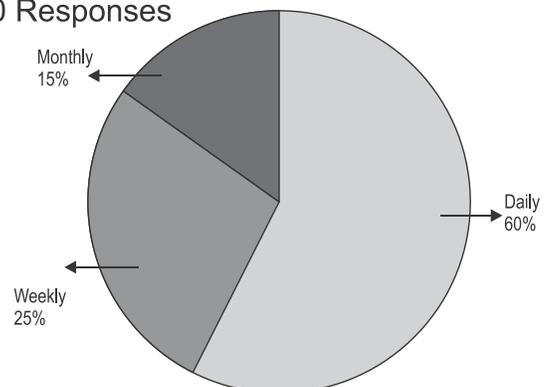


Chart No 4

Interpretation: The table and chart portrays that 15% of respondents are using digital payment option on a monthly basis, 25% of them are using it on weekly basis and 60% of respondents are using it on daily basis. This shows higher rate of penetration of digital payments apps.

Hypothesis Testing.

Objective 1: To examine new trends of digital payment systems in the Thane district.

(H_0): There is no significant emergence of new trends in digital payment systems in the Thane district.

(H_1): There are significant emerging trends in digital payment systems in the Thane district.

Objective 2: To study consumer behavior, or the impact of adopting digital payments across banking.

(H_0): The adoption of digital payment systems has no significant impact on consumer behavior in the banking sector.

(H_1): The adoption of digital payment systems has a significant impact on consumer behavior in the banking sector.

Hypotheses have been tested using statistical methods such as chi-square tests and t-tests depending on the nature of the data collected.

Limitations of the Study

1. Regional Scope: The present study only focuses on the Thane district, therefore its generality cannot be applied for other regions.
2. Sample Representation: The selected sample might not be an adequate representation of the various population demographics.
3. Technological Advancements: Technological advances in digital payments can easily make the information obsolete.
4. Self Reported Bias: Surveys may introduce recall or social desirability biases in the data gathered.

5. Fintech Exclusion: The study focuses on the banking industry and excludes the fast-growing influence of fintech companies.

Findings of the Study

A. Factors Influencing Adoption of Digital Payments:

- 1) Convenience: The largest number of respondents cited convenience as the reason to use digital payments: 80%.
- 2) Security: 60% reported that security was a concern but chose digital payments based on convenience.
- 3) Speed of Transaction: Speed of transactions was an important factor to consider in their choice; 50% of the respondents felt so.

B. Challenges Faced by Consumers:

- 1) Digital Literacy: 40% of the respondents in rural areas said they lacked knowledge about digital payments.
- 2) Internet Connectivity: 30% of the respondents in rural areas said that accessing stable internet connections for digital payments is a challenge.
- 3) Security: 35% of the respondents were concerned about the security of online transactions.

C. Impact on Banking Behavior:

- 1) Increased Frequency of Transactions: 65% of respondents claimed to carry out more frequent transactions following the adoption of digital payment systems.
- 2) Customer Satisfaction with Banking Services: 75% of the respondents were satisfied with the easy facilitation of transactions, but they also complained about the requirement for improved customer support for digital banking.

Recommendations & Suggestions

- Digital Literacy Programs: Programs for digital literacy improvement especially in rural areas can enhance the rate of adoption.

- **Security Enhancement:** Improving the security of digital payments and educating consumers on safe internet practices.
- **Infrastructure Development:** Improving internet connectivity to rural areas to ensure easy digital payments.
- **Customer Support:** Banks and fintech companies should have robust customer support to help users when there is a technical issue.

Conclusion

The study observes that, notwithstanding the fact that digital payment systems have become very popular in recent times in the Thane district, several challenges seem to prevail, ranging from accessibility-related issues and security to digital literacy. An even more inclusive and more robust digital payment ecosystem created by addressing these concerns may be crucial in building higher consumer trust and satisfaction.

The literature emphasizes that, on the one hand, digital payment systems are transformative in themselves but, at the same time, pose various challenges that need to be bridged. A micro-focus study on the Thane district would provide tremendous learning on regional adoption trends and implications for the banking industry. This investigation will form part of a process where the development of emerging trends on digital payments will find resonance in shaping consumer behavior at specific localized levels.

The findings indicate that , **(H0)** was rejected based on the findings of the test of the hypothesis. We arrive at the conclusion that, **(H1)** is Accepted and conclude there is a significant emerging trend in adoption of digital payment systems that has an impact on consumer behavior in the banking sector.

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How AI Changing the Banking Industry in 2025

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Introduction

Artificial Intelligence (AI) is reshaping the banking industry at an unprecedented rate. With AI technologies becoming more advanced and accessible, banks are discovering that AI is not just a tool for innovation it is an essential driver of growth, efficiency, and customer satisfaction. From revolutionizing customer experience to enhancing operational efficiency and risk management, AI is set to unlock over \$1 trillion in annual value for the global banking industry by 2030, according to McKinsey.

As we look toward 2025, AI adoption will be critical for banks to maintain their competitive advantage in a rapidly evolving digital ecosystem. In this article, we explore the 10 essential benefits AI will bring to the banking sector, backed by case studies, research, and expert insights.

What is AI in Banking and Finance?

Artificial intelligence (AI) has made waves across many industries, and AI in banking and financial services is no exception. These technologies bring efficiency, speed, and value, automating manual tasks, minimizing the risk of errors, and reducing costs.

Use of AI in banking is on the rise, and for good reason. AI tools can help with risk management, regulatory compliance, fraud detection, investment and portfolio management, data security, and many other critical areas for the banking and finance sector.

Embracing artificial intelligence is no longer a matter of choice — failing to take advantage of this technology will put your organization at risk of falling behind. By

strategically embedding AI can improve operational performance, enhance customer experience, and ensure that the business remains competitive in an increasingly digital and data-driven marketplace.

The Rise of AI in Banking

AI isn't a brand-new concept in the banking industry. For a long time now, the sector has leveraged advanced data and analytical methods to enhance operations and boost returns. With technologies advancing, AI tools can now process large amounts of data to produce extensive, accurate forecasts, identify emerging trends, and steer decision making.

Managing market and pricing volatility has quickly become one of the key AI trends in banking. In recent years, the sector has been hit by a number of significant global events including the COVID-19 pandemic, political upheaval, and the war in Ukraine.

A World Bank Group report estimates the war alone has cost the financial sector a staggering \$5.7 billion. These events have meant many organizations have turned to technology to limit their impact and provide stability in times of severe disruption.

Compliance is another one of the major applications of AI in banking. With so many strict laws and regulations to follow, getting this right and monitoring adherence amongst employees is a complex task. Using AI in the banking industry allows organizations to streamline regulatory compliance and ensure all protocols are being followed correctly — a key reason why 68% of financial firms plan to leverage AI for risk management and compliance.

The financial sector has also taken inspiration from other industries when it comes to applications of AI in banking. A wide range of businesses are now using virtual assistants and communications APIs to offer personalized support, automate customer service interactions, and save operational costs. Banks are taking advantage of these chatbots to free up their teams for more strategic tasks and to provide consistent and exceptional levels of service to customers.

Why AI matters to banking services and financial organizations?

Ours is increasingly a digital-first world, meaning businesses are quickly realizing the advantages of AI in banking. More and more organizations are using AI-driven tools to automate routine processes and free up teams for higher-value tasks, bolster fraud protection, and deliver faster, more efficient customer service.

Customer expectations are rising, too. Almost three-quarters demand better personalization as technology advances, according to Salesforce's State of the AI Connected Customer report.

Omnichannel banking is critical to meeting these customer expectations. AI helps enable seamless integration across channels, offering a unified and consistent experience whether customers interact via mobile apps, websites, or in-branch services. This omnichannel approach, powered by AI technology in banking, ensures personalized recommendations, faster responses, and better service delivery.

Benefits of AI in Banking

The use of AI in banking and finance isn't just a box-ticking exercise or a gimmick to impress customers. AI tools offer a variety of significant benefits to streamline operations, minimize fraud and risks, and provide greater service to customers and investors.

1. Improve fraud detection and prevention

AI tools can process and analyze huge swathes of data in a matter of minutes. This capability is critical for

protecting customer assets and maintaining trust, allowing banks to monitor real-time activity and flag unusual behavior such as abnormal transaction volumes or unauthorized access attempts. The speed and accuracy of this process are simply unmatched by any human equivalent, making it one of the most important examples of AI in banking.

AI can even adapt to evolving threats, making fraud prevention more dynamic and robust. For financial institutions, minimizing fraud-related losses while ensuring compliance with regulatory standards and laws is vital. Leveraging AI in this way allows banks to address these concerns proactively, offering a much safer banking environment.

2. Provide personalized financial services

Analyzing data isn't just about preventing fraud. It also unlocks valuable information about customers, such as spending habits, saving patterns, and investment preferences, so one can personalize business communications and recommend tailored products.

Virtual agents can provide customized financial advice in real-time. This heightened level of personalization is a great way to level up your customer experience and foster customer loyalty. By making interactions relevant and individualized, banks can differentiate themselves and better address diverse financial needs.

3. Streamline loan approval processes

Loan approvals are traditionally a lengthy process involving lots of manual evaluations. Implementing AI that uses advanced models factoring in both conventional and alternative data points can analyze income and spending behavior to assess credit worthiness virtually instantly.

For customers, faster decisions improve satisfaction, and for banks, automation reduces operational costs, expands access to credit, and limits human bias. Since AI can provide more accurate risk assessments, it also reduces the chance of default risks, ensuring the bank's financial stability while enabling more inclusive lending practices.

4. Leverage predictive analytics for investment

Using AI in the banking industry empowers one to make smarter decisions. AI-driven predictive analytics helps investors and financial organizations identify promising investment opportunities. That allows for optimized portfolio management and more informed trading strategies.

This is particularly important in fast-moving markets, where timing can mean the difference between profit and loss. Being able to process vast amounts of data in a short space of time means traders can act quickly, optimize their portfolios, and achieve better returns.

For clients, this translates to more reliable investment strategies and increased trust in financial services. A portfolio manager, for example, can use AI technology to analyze historical stock performance, current market trends, and economic forecasts. This can help predict how a particular stock might perform in the future and guide the portfolio manager on how to adjust investments accordingly — such as by increasing shares in a growing technology company or reducing exposure to a struggling sector.

5. Enhance regulatory compliance with automation

Compliance is a crucial consideration for any banking or financial business. Operating under strict regulation means organizations must have robust processes in place to fulfill all their legal obligations, meet industry standards, and satisfy service requirements. This demands a huge amount of time, resources, and effort — and even then, human error is commonplace.

AI can help automate some of these processes by verifying customer identities, analyzing transaction data, and flagging suspicious activities. Natural language processing (NLP) can also review compliance reports and legal documents for inconsistencies. This reduces human error and accelerates regulatory processes.

Compliance is vital for avoiding legal penalties and maintaining a strong reputation. AI enables banks to

handle these requirements efficiently, allowing staff to focus on strategic tasks while maintaining a high standard of accountability.

6. Offer better customer support

Virtual assistants are everywhere these days. Businesses are opting for AI-powered customer service solutions to offer personalized interactions, speedy responses, and real-time issue resolution. This also enables seamless, consistent customer support across multiple channels, including apps, websites, and branches.

With the ability to handle high volumes of queries simultaneously, using AI technology in banking for customer support reduces wait times and improves customer satisfaction. This fosters loyalty and positions banks as technology-forward institutions.

Uses of AI in Banking

The applications and possibilities of AI are almost endless. Whether it's simply automating manual tasks, identifying suspicious activity, or optimizing portfolios to maximize investment returns, artificial intelligence is a game-changer. Let's take a closer look at some AI use cases in banking:

1. Blocking suspicious transactions

One of the most important examples of AI in banking is its use in preventing fraud. For example, AI tools can immediately identify if a customer's credit card is used in two countries within an hour. The system can flag this, block the transaction, and alert the customer quicker than any human could. This real-time capability is crucial for minimizing financial losses and protecting customer trust.

2. Detecting money laundering in complex transactions

AI systems can analyze large volumes of transaction data at once. Using these tools allows banks and financial firms to uncover hidden money laundering schemes, such as layering funds across multiple accounts and jurisdictions.

For example, if multiple small deposits from different locations are transferred to a single account, AI can flag the pattern. This process would overwhelm human analysts but is routine for AI, which excels at detecting subtle, large-scale anomalies. This ensures compliance with regulations while saving time and resources.

3. Automating mortgage pre-approvals

Banks receive millions of mortgage applications every year. Unsurprisingly, processing these applications takes a significant amount of time and requires a great deal of human scrutiny to assess affordability.

AI streamlines mortgage pre-approvals by analyzing applicant data, such as income, credit behavior, and property value, to calculate eligibility in minutes. For instance, a first-time homebuyer can use online banking to receive a quicker decision.

AI also eliminates human bias and accelerates processing, making homeownership more accessible. This efficiency benefits banks by reducing costs and customers by offering fast, transparent decision-making.

4. Real-world examples of AI in banking

The power of AI sounds impressive on paper, but how does it work in practice? Let's explore a couple of AI in banking examples below to discover the real-world applications of artificial intelligence:

Challenges with artificial intelligence and banking

Having seen the potential benefits, you might be wondering about the disadvantages of AI in banking. Using any technology is not without risk, but being aware of these risks and taking steps to mitigate them will ensure one can implement tools successfully and maximize their effectiveness.

1. Security and data privacy

Data security threats are one of the most significant risks of AI in banking. Due to the sheer amount of customer data banks must process daily, it's no surprise that cyberattacks and breaches are a serious

concern for the entire sector. This could result in loss of customer trust, reputational damage, and hefty regulatory penalties.

To avoid this, banks should implement robust security processes and train staff on the importance of complying with regulations and protocols. This might include strengthening encryption techniques, conducting regular security audits, and enforcing strict access controls.

2. Bias in AI models

If your systems have been exposed to biases in their training data and models, AI algorithms can inadvertently perpetuate these. This could result in discriminatory outcomes in areas like credit approvals or personalized financial advice, which puts one at risk of legal liabilities and reputational damage.

Making sure one's data sets are diverse and robust is the first priority to ensure one's AI tools are trained appropriately. Involving cross-functional teams during AI development will also help to promote inclusivity and equity, and regular audits will reduce the risk of biases going unnoticed.

3. Regulatory compliance

The speed at which AI technology is developing often outpaces the regulatory frameworks governing its use. For this reason, there is a real risk of non-compliance — leading to fines, operational disruptions, or reputational damage.

Actively collaborating with regulators will help to mitigate this, empowering organizations to prioritize transparency in AI decision-making and adopt adaptive compliance frameworks. These efforts will reduce risk and ensure **artificial intelligence is being used fairly and ethically.**

How banks should approach AI: best practices

Artificial intelligence in banking and finance can be a powerful tool, but only if implemented and maintained correctly. These best practices will set one up for success and give them confidence in their AI systems:

1. Develop robust, explainable AI models

Building an accurate and reliable AI model takes serious time and effort, but it's an absolute necessity. If one's AI technology is based on poor data or biases, the output is worthless.

Providing clear, interpretable reasoning for one's AI's decisions (e.g., credit scoring) helps satisfy regulatory requirements, enhances customer trust, and ensures that employees can effectively oversee and understand the AI's actions.

2. Implement ethical AI guidelines

Creating industry-specific ethical guidelines will support one in addressing challenges like fair lending practices, anti-money laundering, and fraud prevention.

These should include rules for minimizing bias in loan approvals or trading algorithms and guidelines for ensuring equitable outcomes for all customer segments.

3. Invest in AI-specific training

AI tools are only as effective as the people using them. Targeted training programs will support employees to understand AI tools and their applications in banking. That will give them the ability to monitor and analyze AI outputs, manage any challenges, and maintain ethical regulations.

AI does not replace human oversight, but this training will align human expertise and machine intelligence for maximum efficiency.

Future of AI in banking

What might be the future of AI in banking look like?

With technology developing so rapidly, banks and financial businesses should continue prioritizing AI innovation if they want to stay ahead of the curve. This means investing in new applications, updating existing tools, and being open to change.

As more organizations employ artificial intelligence, transparency, compliance, and ethics will become key

issues. Businesses will have to be proactive in sharing their policies and guidelines to ensure their AI tools are operating properly and customers and regulators are satisfied.

Banks are under increased pressure to provide the best experiences they can. As customer expectations continue to rise, leveraging artificial intelligence will enable financial firms to personalize advice and interactions, provide prompt and effective services, and maintain compliance and regulatory requirements.

Integrate communication solutions with AI in banking to boost client service, security, and operational efficiency

Integrating AI into banking operations helps institutions deliver better client service, strengthen security, and improve operational efficiency. With the right communications solution, you can enhance customer experiences, support compliance efforts, and improve business outcomes.

Jason Osborne, Banking & Capital Markets Leader for North America at Genpact, gives his prediction for banking and fintech in 2025

In this exclusive Q&A, FinTech Magazine speaks to Jason Osborne, Banking & Capital Markets Leader for North America at Genpact, who delivers his insights on the evolution of the banking and fintech industries for 2025.

How do you expect the banking industry to evolve next year, and what is driving these changes?

First and foremost, I expect to see a strategic pivot in how banks and financial institutions approach both risk management and customer experience.

In the midst of rapidly changing regulations, banks will have to prioritise investment in artificial intelligence (AI) capabilities that can provide risk mitigation in addition to business growth.

Investment in data infrastructure, compliance automation and talent acquisition will be critical in the year ahead to navigate the regulatory landscape.

For customer-centric organisations, the focus will be on breaking down silos to establish a customer-first mindset that permeates all levels. AI will serve as the backbone for delivering faster, smarter, and more personalised customer experiences.

Those who integrate AI into their workflows, culture, and training programmes will thrive in an increasingly competitive landscape.

Ultimately, AI is becoming a critical differentiator – whether it's in managing complex regulatory changes or delighting customers with seamless experiences. Organisations that adapt quickly and embrace AI holistically will have the edge in 2025 and beyond.

Speaking of AI, what role has this technology begun to play for financial organisations, and are there operational areas that might see a boom in 2025?

Consumers expect customer care agents to get their problems fixed the first time, every time. The desire for instantaneous, effective support will only heighten in 2025.

Organisations must already be offering education and training on how AI can be embedded into workflows to improve customer experience. A customer-first, AI-enabled culture is crucial across all departments.

The future of customer support isn't about replacing human agents with AI but enhancing them.

By equipping support teams with AI-driven insights, chatbots and virtual assistants, organisations can enable human agents to focus on complex, emotionally nuanced issues while AI handles routine queries.

This leads to faster resolutions, increased customer satisfaction, and reduced support costs.

In 2025, one exciting step for customer experience will be leveraging AI to predict customer needs even before they express them. AI-powered predictive analytics can analyse past behaviours, preferences, and real-time interactions to tailor solutions, whether it's proactive issue resolution or personalised product recommendations.

What do financial institutions need to do to prepare themselves for the continuing AI boom?

Embedding AI into the organisation's DNA means cross-departmental training. Customer care, marketing, technology and even finance teams should be educated on how to leverage AI tools.

By integrating AI into various workflows, companies can foster a culture of continuous improvement where every department contributes to customer satisfaction.

AI systems are only as good as the data fed into them. To stay ahead, organisations must implement continuous learning mechanisms where feedback from customer interactions refines AI algorithms.

This ensures that AI becomes more effective over time and adapts to evolving customer expectations.

Finally, as AI becomes more integral to customer experiences, transparency and ethical AI practices will be crucial. Customers will expect to understand how their data is used, and organisations that prioritise ethical AI deployment will earn greater trust and loyalty.

"Banks that leverage AI for predictive risk simulations will gain a competitive advantage by forecasting outcomes and adjusting strategies preemptively".

Jason Osborne, Banking & Capital Markets Leader for North America, Genpact

How are banks and other financial institutions preparing for potential regulations in 2025?

As we see proposed regulations like Basel III Endgame continue to evolve, banks are looking to optimise risk models to address every component of potential deals. This will necessitate strengthening data and analytics capabilities through AI.

In addition to optimising individual risk models, banks are shifting toward integrated risk management. This means AI will not only assess credit or market risk, but also synthesise multiple risk categories (e.g., liquidity, operational, and compliance risks) into a unified view.

Banks that leverage AI for predictive risk simulations will gain a competitive advantage by forecasting outcomes and adjusting strategies pre-emptively.

Basel III Endgame will also necessitate enhanced data integrity. Banks will need to build real-time, AI-driven analytics platforms that integrate seamlessly with risk management tools, enabling continuous monitoring of risk exposures.

Regulatory compliance isn't just about meeting current standards but being proactive in anticipating new changes.

"With the increased reliance on AI and data analytics, banks will need to invest heavily in upskilling their teams"

Jason Osborne, Banking & Capital Markets Leader for North America, Genpact

With risk management such a key priority next year, how can banks become more agile in leveraging these tools?

Optimising risk management won't just be about analytics. It will also involve automating risk reporting and regulatory compliance processes to reduce costs and improve speed.

This is where machine learning algorithms can automate the identification of risk anomalies, fraud detection, and stress testing - freeing up human resources for strategic decision-making.

With the increased reliance on AI and data analytics, banks will need to invest heavily in upskilling their teams. Expect to see banks hiring data scientists, risk technologists, and AI ethicists who can balance compliance with innovation.

He also expects to see a greater focus in the coming year on ensuring the entire organisation has a comprehensive view of their data. Improving data visibility across the organisation is critical to avoiding silos and keeping every department aware of how their decisions are impacting the business.

5 Leading Uses of AI in Banking and Finance for 2025



1. Revolutionizing Customer Experience with AI in Banking

The customer experience is a critical battleground for banks, and AI is transforming these interactions by enabling personalized, always-available services. With AI, banks can create exceptional customer service experiences that build trust and loyalty. AI-powered tools are enabling banks to provide more responsive, convenient, and individualized services at every touchpoint, fundamentally changing the way customers interact with their financial institutions.

a. Role of Generative AI in Enhancing Customer Interactions in Banking

Generative AI enables hyper-personalized banking experiences by analyzing vast amounts of customer data. For example, HSBC uses GenAI to create customized product recommendations based on individual spending habits. This technology leverages vast amounts of customer data and sophisticated algorithms to transform traditional banking practices into a more dynamic and engaging experience for customers.

- Generative AI excels in proactive issue resolution. By continuously monitoring customer accounts and transactions, GenAI systems can identify potential issues before they escalate into problems.
- By automating routine inquiries such as balance checks or transaction histories, GenAI frees up human agents to focus on more complex issues that require personal attention. This not only improves operational efficiency but also enhances the overall customer experience by reducing wait times for assistance.

Joanne Hannaford, CIO and Chief Product Officer (CPO) at Deutsche Bank's corporate bank remarked that, "AI requires huge amounts of compute and really the only way that you are going to be able to access the compute (computing power) sensibility is from Big Tech."

b. Real-time Personalization Strategies to Enhance Customer Experience

AI enables real-time personalization by analyzing customer data and behavior. A study by Epsilon found that 80% of consumers prefer brands that offer personalized experiences. Banks leveraging data-enabled AI technology can analyze transaction data in real-time to provide tailored offers and services.

A leading example is Wells Fargo, which has successfully adopted AI-driven personalization strategies. Using machine learning algorithms, Wells Fargo's AI systems analyze customer behavior across digital channels such as mobile apps, websites, and even in-branch interactions to understand preferences and anticipate needs.

Wells Fargo's AI-driven personalization has led to a 50% increase in digital product adoption rates among its customers. It is more focused on delivering tailored recommendations in real-time, such as suggesting appropriate savings accounts, investment products, or loan offers based on the customer's transaction history, life events, and financial goals.

c. Emotional AI in Customer Service in Banking

Emotional AI stands out as a critical advancement within the scope of AI-powered customer service. While traditional AI focuses on providing accurate responses to customer inquiries, Emotional AI goes further by interpreting and responding to human emotions in real-time.

For example, Citi's virtual assistant uses Emotional AI to monitor customer sentiment during interactions. Whether through voice analysis in phone conversations or text analysis in chat services, the AI can detect if a customer is frustrated, anxious, or confused. If a customer sounds distressed, the system can respond in a calm and supportive manner, offering reassurance and escalating the issue to a human agent if necessary.

Bank of America's virtual assistant, Erica, uses emotional AI to provide empathetic responses, improving customer satisfaction by 20%. This capability is especially useful in stressful financial situations, where understanding and emotional intelligence are paramount to maintaining trust in AI-driven systems.

2. Boosting Operational Efficiency and Innovation with AI in Banking

Banks are leveraging AI to streamline operations and introduce innovative solutions faster, ensuring that they stay ahead in an intensely competitive market.

a. How AI Technologies Drive Faster Innovation in Banking?

AI banking technology enables banks to analyze large datasets quickly, allowing them to introduce new products to market at a faster pace. Financial institutions are leveraging AI to streamline operations and cut costs. For example, Goldman Sachs has made significant investments in fintech startups to boost its AI banking technology and capabilities.

Traditional banking processes are being completely reimaged through AI-powered systems. Credit risk assessment, traditionally limited to analyzing 8-10 variables, has evolved into a sophisticated system capable of processing over 100 different factors simultaneously.

b. Streamlining Operations: AI's Impact on Cost and Time Efficiency in Banking

AI-powered automation has reduced the cost of routine banking operations by 25-30% for institutions like Wells Fargo, which uses AI to automate its mortgage processing, saving millions in operational costs each year. Additionally, CitiBank reports that AI reduced their document processing time by 60%, contributing to significant cost savings.

c. Predictive Banking Services Using AI

AI helps banks anticipate customer needs and offer proactive financial advice. AI-powered predictive analytics enable proactive financial services:

- **Cash Flow Prediction:** AI analyzes spending patterns to forecast future financial needs
- **Fraud Prevention:** Real-time transaction monitoring to identify suspicious activities
- **Investment Opportunities:** Automated identification of personalized investment options based on risk profile

Banks using predictive AI have reported a 60% detection in fraud incidents and improvement in customer retention rates.

d. Voice and Facial Recognition Banking

Biometric AI technologies, such as voice and facial recognition, are revolutionizing security and convenience in banking. These technologies work by capturing and analyzing unique biological traits to verify a customer's identity, offering an additional layer of protection against fraud. For example,

HSBC integrated biometric authentication into its mobile banking app, reducing fraud by 80% and improving customer trust.

How Voice and Facial Recognition Work?

1. Voice Recognition: Voice recognition analyzes unique speech patterns like pitch and tone to create a voiceprint, which is compared with stored data to verify a user's identity. This ensures only authorized users can complete transactions.

Example: Capital One uses voice recognition to secure transactions with voice-based identity verification.

2. Facial Recognition: AI-driven facial recognition maps distinct facial features, creating a faceprint to match against stored data for authentication. It enables seamless logins and secure transactions without needing passwords.

Example: HSBC uses facial recognition in its app to offer customers quick, secure access without multiple authentication steps.

These technologies enhance security while providing a seamless banking experience, removing the need for traditional passwords and PINs.

24/7 AI-powered Advisory Services in Banking

With AI, banks can offer round-the-clock advisory services. Chatbots are available around the clock to provide immediate assistance and financial advice. For example, Chime's chatbot offers real-time support for account queries.

Continuous financial guidance through:

- **Automated Portfolio Management:** AI-driven investment rebalancing and optimization
- **Round-the-clock Support:** Always-available financial advice and support

Market Analysis: Real-time market insights and investment recommendations

Success Metric: Morgan Stanley's AI advisory systems manage over \$2 trillion in client assets, with a 35% increase in client engagement.

3. Building a Competitive Edge: AI for Growth and Differentiation in Banking

AI offers banks the ability to stand out in an increasingly crowded market by providing superior customer experiences and optimizing operations for growth. Through AI-driven insights, personalized services, and API-first architectures, banks can differentiate themselves and meet the growing expectations of digitally savvy customers.

a. Enabling a Growth Agenda Through AI-driven Insights in Banking

Banks leverage AI-powered insights to understand customer behavior more deeply and drive growth. AI analyzes customer data such as spending patterns, transaction histories, and product preferences to provide banks with actionable insights. This allows them to segment their customers more accurately and tailor marketing campaigns that resonate with specific customer groups.

Barclays uses AI-powered analytics to improve its customer segmentation, enabling targeted marketing campaigns that have resulted in a 20% increase in new account openings. AI's ability to anticipate customer needs enables Barclays to better engage with its audience, increasing satisfaction and customer loyalty.

b. How AI-Driven Insights Work?

AI tools use machine learning and predictive analytics to process large volumes of customer data, uncovering patterns and predicting future behaviors. This allows banks to create more tailored offers and anticipate customer needs, ultimately driving revenue growth and improving customer acquisition rates.

c. How AI Can Help Banks Stand Out in a Crowded Market?

AI for banking allows banks to differentiate themselves by delivering innovative digital services that address the evolving needs of modern customers. A key strategy involves adopting an API-first banking architecture, enabling seamless integration with third-party services, and facilitating open banking solutions. With APIs, banks can offer a broader range of services, including personal finance management tools and investment platforms, through collaborations with FinTech companies.

By leveraging APIs, banks can quickly deploy new digital services and personalized customer experiences without overhauling their existing systems. This flexibility allows them to stay agile and respond to customer demands faster than traditional competitors.

Standard Chartered Plans to integrate new AI capabilities with Microsoft Copilot for Sales to streamline client communications and improve data quality. By embedding AI into its sales and client relationship management processes, Standard Chartered can provide more personalized service,

enhance data quality, and respond to client needs more efficiently.

d. Why API-First Architecture Matters?

An API-first approach allows banks to be more modular and agile in their offerings. Banks can collaborate with external service providers to offer features like automated financial advice or seamless payments through third-party apps, enhancing customer engagement and offering services that are difficult for competitors to replicate.

4. Enhancing Risk Management and Regulatory Compliance with AI in Banking.

As we approach 2025, artificial intelligence is poised to significantly transform how banks manage risk and ensure regulatory compliance. This shift comes at a critical juncture global financial crime, including money laundering, fraud, and cybercrime, is costing banks billions of dollars annually. According to the United Nations Office on Drugs and Crime (UNODC), financial crime accounts for up to \$2 trillion in global money laundering annually. The growing complexity of financial crime means that the need for sophisticated, AI-powered risk management tools has never been greater.

AI enables banks to automate regulatory processes, detect fraudulent transactions in real-time, and ensure compliance with international and local regulations more efficiently. As financial regulations become more stringent and financial crimes evolve, AI will be key to staying ahead of these challenges.

a. AI-powered Solutions for Fraud Detection and Prevention in Banking

The future of banking security lies in predictive AI systems that can spot fraud before it happens. Advanced algorithms can analyze transaction patterns to detect anomalies indicative of fraud. For instance, American Express employs machine learning models that analyze billions of transactions daily to flag suspicious activities.

Case Study: Mastercard's AI Innovation

Leveraging Mastercard's generative AI-powered predictive technology, future transactions can be safeguarded from emerging threats by:

- Doubling the detection rate of compromised cards
- Reducing false positives in identifying fraudulent transactions involving potentially compromised cards by up to 200%
- Accelerating the identification of at-risk or compromised merchants by 300%

According to the President and CTO of Mastercard, McLaughlin emphasized, "In the past 12 months, they have prevented over \$20 billion in fraud.

a. Complying with Regulations: How AI Shifts the Risk Management Landscape in Banking

AI is transforming regulatory compliance by automating risk assessments and reporting. Automation of regulatory reporting reduces compliance costs and errors.

"The integration of AI in compliance isn't optional anymore - it's a competitive necessity," notes Sarah Bloom Raskin, former Deputy Secretary of the U.S. Treasury.

d. Real-World Implementation: HSBC Enhancing Anti-Money Laundering (AML) Efforts

Challenge: Money laundering poses a significant challenge for financial institutions globally. Traditional systems that detect illicit activities often struggle to handle modern financial transactions' immense volume and complexity. As a result, these systems can become overwhelmed, allowing fraudulent activities to go unnoticed and exposing banks to substantial regulatory penalties.

Solution: To address this, HSBC implemented an AI-driven system to strengthen its anti-money laundering efforts. This cutting-edge solution utilizes advanced machine-learning algorithms to analyze vast real-time transactions. By identifying unusual patterns and potentially illegal activities, the system is far more

effective at distinguishing between normal and suspicious behavior than traditional methods. This AI-powered approach enables HSBC to navigate the complexities of contemporary financial crime while enhancing compliance and mitigating the risk of oversight.

Overall Impact:

Impact Area	Description
Enhanced Detection Rates	The AI system has significantly improved the identification of suspicious transactions, reducing the threat of financial crime.
Fewer False Positives	The system’s accuracy in differentiating legitimate transactions from suspicious ones has minimized disruptions for innocent customers.
Improved Compliance	AI aids in keeping pace with evolving regulatory demands, ensuring quicker adaptation to new rules.
Cost Savings	Automating surveillance processes has reduced the need for large manual review teams, lowering operational costs.

5. Optimizing Wealth and Investment Management Through AI Banking Solutions

The wealth management industry is undergoing a revolutionary transformation through artificial intelligence.

a. Leveraging AI for Personalized Money Management Solutions in Banking

AI-powered systems are revolutionizing personal finance by delivering customized financial advice and portfolio management strategies based on individual circumstances:

- **Behavioral Analysis:** AI algorithms analyze spending patterns and financial behaviors to provide personalized recommendations
- **Risk Profiling:** Advanced ML models assess risk tolerance through both traditional questionnaires and behavioral data
- **Goal-Based Planning:** AI systems create and adjust financial plans based on life events and changing objectives

b. Case Study:

Morgan Stanley’s Next Best Action- Morgan Stanley Wealth Management

A leading global financial services firm in the USA is streamlining one of the most challenging aspects of a financial advisor’s job.

Their internal team leverages OpenAI’s GPT-4 to extract valuable insights from an extensive knowledge base containing thousands of pages. This crucial information empowers financial advisors to enhance their research and data collection efforts, benefiting their clients.

In addition, Morgan Stanley has advanced its AI capabilities with the Next Best Action system, which personalizes client communications and provides tailored investment and wealth management recommendations through AI banking solutions.

c. Most Popular AI Applications in Banking Today

The banking industry is swiftly embracing new AI tools for investors and AI banking technology to revolutionize its operations. These advanced tools, highlighted in the table below, empower banks to personalize customer interactions, enhance security, and optimize workflows. As AI continues to advance, its incorporation into mobile banking and operational efficiencies promises to reshape traditional banking practices. With a projected expenditure of \$84.99 billion by 2030, the potential of AI in banking is vast and promising.

Banking Service	AI Tool	Benefits of Using the Tool
Customer Experience	Adobe Sensei IBM Watson Assistant Sales force Einstein OpenAI's GPT-4	These AI tools enable banks to personalize digital interactions by analyzing customer behavior, tailoring content, and providing quick query responses and transaction support. Enhances stronger customer connections across multiple channels
Fraud Detection	SAS Fraud Management Abriqo's Fraud Detection Feedzai	These tools enable banks to strengthen fraud detection through real-time monitoring, advanced analytics, and adaptive machine learning. They help analyze transaction patterns, detect anomalies, and provide risk scoring to minimize false positives
Operational Efficiency	Ui Path Data Robot SBP Core Platform	These AI tools enhance operational efficiency in banking by automating repetitive tasks, enabling rapid predictive analytics, and streamlining core banking functions. Facilitates quicker decision-making and reduces operational costs.
Mobile Banking	Pin drop One Signal IBM Watson	These AI tools help integrate targeted push notifications and in-app messaging to enable personalized communication, informing customers about account activity, promotions, and essential updates.

The Future of Investment Strategies: AI's Role in Portfolio Management in Banking

AI is transforming traditional portfolio management approaches through:

Aspect	Explanation	Example/Benefit
AI-Driven Portfolio Optimization	AI uses advanced algorithms to create dynamic, optimized portfolios that adjust based on real-time market conditions.	Improves risk-adjusted returns and offers more accurate market forecasts.
Real-Time Data Integration & Analysis	AI processes real-time data from diverse sources, such as social media, news, and alternative data, for better decisions.	Uses alternative data (e.g., satellite imagery) for more informed investment decisions.
AI-Powered Robo-Advisors	AI-driven platforms offer personalized, low-cost investment strategies tailored to individual preferences.	Betterment & Wealth front provide scalable wealth management to retail investors.
Predictive Analytics for Market Trends	AI analyzes historical and real-time data to forecast market trends and asset performance.	AI helps in quantitative investing & predicting market shifts before human analysts.
Continuous Monitoring & Rebalancing	AI continuously monitors and automatically rebalances portfolios in real-time to maintain optimal asset allocations.	Wealthfront improves tax-loss harvesting, increasing after-tax returns by 1-2% annually.
Risk Management & Scenario Analysis	AI simulates economic scenarios (e.g., market crashes) and stress-tests portfolios for better risk management.	BlackRock's Aladdin platform runs stress tests to mitigate risks.
ESG Integration with AI	AI analyzes Environmental, Social, and Governance (ESG) data for sustainable investment strategies.	AI-driven ESG ratings rank companies based on sustainability metrics.
Enhancing Human Decision-Making	AI augments human expertise by providing data-driven insights, but human judgment is needed for strategic decisions.	Portfolio managers use AI insights to validate and refine their investment strategies.
AI & Blockchain Integration	AI and blockchain work together for secure, transparent investments via smart contracts and decentralized finance (DeFi).	Smart contracts execute investment decisions automatically when conditions are met.

This table provides a clear overview of how AI is transforming portfolio management in the investment industry, highlighting key aspects, explanations, and tangible benefits are examples associated with each aspect.

Conclusion

As we move into 2025 and beyond, embracing artificial intelligence (AI) as a core element of banking strategy is essential for financial institutions aiming to thrive in a competitive landscape. By aligning AI initiatives with business objectives, investing in technology and talent through comprehensive AI training courses, and adopting a customer-centric approach, banks can significantly enhance operational efficiency and customer experience.

Continuous learning and adaptation are crucial as the pace of technological innovation accelerates. Training initiatives, such as Edstellar's Investment Banking Training Course, provide banking professionals with the knowledge and skills necessary to stay competitive in this evolving environment. Further, Edstellar's Skill Matrix template offers a strategic tool for organizations to track and analyze workforce competencies, serving as a blueprint for employee growth that aligns with the bank's operational goals.

The Skill Matrix enables banks to measure progress, identify skill gaps, and foster professional development, ensuring their teams are well-prepared to tackle future challenges. This focus on skill development underscores a commitment to nurturing talent, optimizing team potential, and maintaining a competitive edge through continuous learning.

To remain competitive, banks must transform their operations with cutting-edge AI solutions today. As industry experts note, "The integration of generative AI into banking not only streamlines operations but also transforms how financial institutions engage with their customers." By taking decisive action now, banks can position themselves as leaders in an increasingly digital world.

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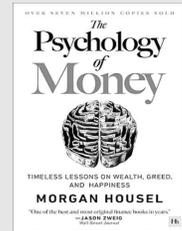
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BOOK REVIEW

Book Title: The Psychology of Money

Authored by Morgan Housel

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Overview

The Psychology of Money is a great read by Morgan Housel, focusing on the intricacies of humans' relationship with money, based on behavioural psychology and personal finance insights. Here, the author analyses how feelings, biases, and experiences direct people's financial choices in ways beyond simply rational thinking. The author discusses the Timeless principles with the help of the importance of patience, warns against the danger of comparison, and highlights how luck plays a role in making a person a successful financial operator. This book emphasises that economic success is not merely about knowledge but also about human behaviour and managing emotions in uncertainty. This work by Morgan Housel is a deep dive into the emotional and psychological factors that drive financial decisions. The book emphasises how personal experiences, social influences, and bias often shape attitudes toward money. Housel says success in finance has less to do with intellect or specific knowledge but rather more to do with behaviours, patience, and thinking in the long term.

The book goes through captivating stories and anecdotes on risk, luck, and the effects of time on wealth creation. He also discusses how people may be irrational. They carry fear, greed, or the need to keep up with others. He will give practical advice on understanding and overcoming those tendencies to build better financial habits. Finally, it is a treatise that nudges readers toward a psychological mindset of creating long-term wealth through simplicity, humility, and emotional discipline. The author's view of personal finance reminds us that how

we think about money is often more important than what we know.

Chapter 1; Of The Psychology of Money by Morgan Housel introduces the concept that managing money is not only about numbers and financial knowledge but also the psychology of how our emotions, biases, and experiences shape our thought processes about handling money. It focuses on how people's financial decisions are often driven by personal beliefs and unique life experiences, rather than purely rational thinking. The chapter begins with the story of how two people having almost the same opportunities can end up so far apart because of how they feel about money. Housel elaborates that personal finance is not just about knowing; it's about behaving. Good financial decisions mostly depend on the ability to suppress emotions. They also require patience and discipline to avoid mistakes. Housel stresses that the truth is that wealth is often built quietly and slowly, not through flashy decisions or big wins. This relates to the overall theme of the book, financial success doesn't necessarily come from knowing the "right" answer but from recognising the importance of patience, humility, and long-term thinking. The chapter broadly gives the whole book a good background. It creates the argument that to master financial skills, the mastery of psychology about money is much more crucial than the technical one.

Chapter 2; The interplay between luck and risk in financial success and failure is discussed thought-provokingly in Chapter 2 of the book. The author effectively clarifies his points by using relatable real-



world examples. He encourages readers to rethink their perception of their financial journey by being humble and acknowledging unknown and uncontrollable factors influencing outcomes. Perhaps, this is one of the chapter's strengths, wherein the story changes from the kind of success only being the outcome of hard work rather than a nuanced view with randomness. It helps readers to know that wealth creation isn't a matter of only making the right moves but, more importantly, avoiding catastrophic risks and being at the right place at the right time. It gives a much-needed perspective on handling success and failure, focusing on resilience and acceptance. This chapter is an important reminder that control is only half the story of financial success, and that luck plays a big role too. How you handle risk is as important as how you take opportunities. It will lay down the foundation for readers to think more critically about their own financial decisions and what is influencing them.

Chapter 3; Presents an interesting reflection on the connection between money and happiness. The author points out that it is critical to seek wealth for the sake of the act without understanding what "enough" means. He asserts that the quest for more can easily modify to obsession and take away peace and satisfaction, which should ideally come with financial security. This chapter is particularly insightful in its context of how societal pressures, comparisons with others, and internal ambitions distort our views of what we need. Housel does a great job of showing that wealth, in and of itself, doesn't guarantee happiness, and the relentless pursuit of more can erode personal contentment. His writing is very accessible and filled with examples, making the concept relatable, whether you are thinking about the lives of the ultra-wealthy or your financial situation. The chapter stresses the idea that financial contentment is subjective. "Enough" cannot be a size that fits all, and only the person knows what amount of wealth provides peace of mind. People might avoid the snares of greed and dissatisfaction that often attend wealth by accepting and embracing "enough". Overall, it provides useful guidance for anyone who considers money in their lives, as it reminds them to

consider financial goals and motivations tied to steering a successful pursuit of wealth toward meaningful, personal objectives instead of empty accumulation.

Chapter 4; Confounding Compounding, Housel explores compounding and how it is overlooked or misunderstood. He explains to the reader how to do small things each day, by allowing them to compound over the years, yielding an extraordinary amount. Compounding isn't solely about interest or investments; compounding is often about how habits, relationships, and knowledge accumulate exponentially with time. Housel stresses that the strength of compounding can only be highly perceived when its impact is slow and not readily seen. In real terms, people tend to overlook the effect of long-term growth by preferring quick returns, leading to impatience and poor financial decisions. He uses the example of Warren Buffett, where most of his gains happened through compound interest in investments over several decades. The core message is that true compounding magic can only be seen with time, so one needs to be patient and disciplined in financial matters. The chapter also talks about the tendency of people to undervalue the long-term impact of their choices and actions. Anyone can experience significant growth, not just in money, but in other areas of life, by making small, incremental improvements or decisions that compound over time. The chapter also talks about the tendency of people to undervalue the long-term impact of their choices and actions. Anyone can experience significant growth, not just in money, but also in other areas of life, by making small, incremental improvements or decisions that compound over time. The chapter is one of the most powerful and important sections, detailing the misunderstood concept of compounding. Housel does a great job illustrating how compounding is the key to long-term financial success—and how many people fail to recognise this due to its gradual nature. The chapter is filled with easy-to-understand examples, which makes the concept accessible even to readers who might not be familiar with financial terminology. What is most striking in this chapter is how Housel applies compounding to financial decisions and other aspects of life, such as

knowledge and relationships. His point about how small, seemingly insignificant decisions and actions can build on each other to create extraordinary results over time is thought-provoking. This lesson applies far beyond money and can influence how readers approach personal growth, career advancement, and social connections. Another common flaw of mankind is being impatient with investments or financial goals. Housel wonderfully demonstrates how impatience leads to improper decisions, like selling too early or chasing short-term returns for which the investors might lose the power of compounding. This long-term focus and discipline provide concrete advice for anybody who wants to build sustainable wealth. Overall, *Confounding Compounding* is a great reminder of the importance of time in personal finance. The chapter is motivational for readers, urging them to adopt patience and make decisions that may seem small today but can lead to substantial rewards later. Housel does a great job of reinforcing the idea that wealth is not just about large, dramatic moves but also about consistent, disciplined actions over time.

Chapter 5; *Getting Wealthy vs. Staying Wealthy*, Housel shows what it takes to be wealthy versus staying wealthy. He claims that getting rich often involves taking risks, being bold, and capitalising on opportunities that might demand at least a little recklessness or daringness. Once wealth is achieved, however, the strategies for keeping it become more conservative, concerned with the control of risk, patience, and avoiding loss. He believes that getting rich usually requires the kind of behaviour that might seem reckless or unconventional—entrepreneurship, aggressive investing, or seizing high-risk opportunities with the potential for outsized rewards. However, staying rich is about playing defense: avoiding the catastrophic mistakes that could wipe out accumulated wealth and ensuring that your financial decisions don't expose you to unnecessary risks. The chapter highlights the need for a mindset shift once you have achieved economic success. The skills that helped you build wealth may no longer serve you in the same way as maintaining it. To stay wealthy, you must focus on preserving capital, minimalising risk, and being content

with slower, steady growth rather than chasing high returns. He gives historical examples and anecdotal evidence to show the behaviours that lead to financial ruin for those who do not adjust their strategies after attaining a particular level of wealth. According to him, what defines wealth is not just making money but keeping it and making sure that the gains do not evaporate because of reckless behaviour. The chapter provides a very insightful analysis of approaches needed to get richer versus keep richer. Housel's writing is a very accessible, important distinction that is otherwise largely overlooked while discussing personal finance. Everyone wants to know how to get richer, but they forget about the skills and mindset important for protecting and growing wealth over time. This chapter underlines the importance of adapting to new challenges brought by financial success. One of the chapter's strengths is that Housel approaches wealth building with nuance. He doesn't merely speak about the need to take risks in the creation of wealth but also speaks about the other side of the coin, which involves losing everything and still being patient, humble, and cautious once one achieves financial success. This gives the reader a more balanced view against the traditional understanding that one should play high stakes to get to wealth. Housel argues that the definition of "enough" as described in the early pages is winning requires to remain wealthy. The more you accumulate, the harder it becomes to manage expectations and desires. That's an important reminder about the nature of wealth that there is no permanent state unless you take care of it and that wayward behaviour at the height of your successful endeavors can cause long-term damage. Largely, it is a very insightful and thought-provoking chapter that makes readers not just think about how to get money but also the ways to keep it. It's practical wisdom for anyone looking to build a sustainable financial future. Housel's insights are a strong reminder that the wealth-building journey is as much about caution, discipline, and emotional control as it is about risk and ambition.

Chapter 6; *Tails, You Win*, is one of the most challenging sections. It upsets the traditional view of slow and steady



progression by emphasizing the rarity of extraordinary events that can characterize the financial life of an individual. Housel's exploration into tail events is both insightful and impactful, enabling readers to develop a deeper understanding of the nature of wealth creation and the markets. One of the key points of the chapter is that success often has nothing to do with being consistently great; it is about being in the right place at the right time and occasionally being able to capitalize on a rare opportunity. Housel uses examples, such as the success of companies like Amazon or the early backers of tech startups, to drive home the point that the biggest rewards often come from a few key moments of brilliance or luck. It changes how I would consider failure and success which makes this chapter most valuable. Rather than being oppressed by the fact that there are no consistent, incremental wins, the author recommends that we expect "tail events" and be ready for the dark side of victory. Improving your chances of these extremely rare and life-altering moments depends on whether you can keep your eyes on the long term, be patient, and stay open to big opportunities. The chapter also teaches an important lesson about risk and diversification. Because we can't predict which events will be the ones that create extreme outcomes, Housel advocates for spreading risk and making sure we do not put all our resources into a single bet. This advice is especially valuable for investors and entrepreneurs looking to build wealth over time. Comprehensively, *Tails, You Win* is an enlightening chapter that adds a layer of complexity to how we think about success and failure. Housel expertly challenges readers to rethink the role of extreme outcomes in our financial and professional lives. The chapter underscores the importance of patience, diversification, and being prepared to seize rare opportunities, rather than focusing solely on the predictable, day-to-day grind of wealth-building. It's a reminder that sometimes in the world of money, it's not always the consistent steps that matter the most but those few giant leaps that can change everything.

Chapter 7; Freedom, is a great and thought-provoking meditation on the deeper purpose of money. Housel's

core message—that financial independence, or the freedom to live life as you wish, is the true definition of wealth—resonates deeply, especially in today's consumer-driven culture where wealth is often equated with material excess. The chapter challenges readers to think of what wealth is and to focus on what money can enable in terms of life choices, rather than just the things it can buy. One of the chapter's strengths is how it challenges conventional ideas about success. Rather than glorifying the pursuit of wealth for its own sake or letting lifestyle marketers celebrate the luxuries of life, Housel invites readers to think more deeply about how wealth can often be a tool for greater autonomy and personal freedom. This perspective is refreshing and far more sustainable and fulfilling than thinking about financial goals. Instead of striving for bigger houses or flashier possessions, the chapter encourages a mindset where the goal is financial security and the ability to choose how you want to spend your time and energy. Housel speaks to the "hidden" nature of wealth, too, noting that the most financially independent people in the world don't typically flaunt their riches in conspicuous consumerism. That challenges the notion that one must throw money around to be validated. By considering wealth as an instrument for greater autonomy and peace of mind, the chapter makes a strong case for a more subdued, reflective approach to money. The theme of freedom is also coupled with themes of happiness and personal happiness. Housel argues that achieving financial independence is not about getting more but being able to do and have time to do what brings one joy and has value. In this regard, the book is even rather practical but very philosophical in its reframing of money from acquiring stuff to achieving life. In sum, the chapter *Freedom* stands out as among the most moving chapters in *The Psychology of Money*. It provokes a healthy reflection on the very definition of wealth and leads the reader to a reevaluation of how money works for them beyond its role in acquiring things toward the goal of a life that is freer and fuller of choice. The chapter remains a great reminder that the ultimate value of money lies not in the things we buy but in life we can lead when we have the freedom to choose how we live.



Chapter 8; *Is Man in the Car Paradox*, a sharp and incisive comment on the status role in deciding our financial affairs. Housel does a marvellous job of opening the psyche behind our penchant for flaunting wealth and its hollow outcomes that follow. The chapter puts readers to challenge the motivations that lie behind all their financial decisions and the material possessions they're chasing. One of the key takeaways from this chapter is the concept of "status signalling" and how it can lead to financial decisions that are not aligned with one's actual desires. Housel highlights how the desire for admiration often drives people to make purchases or take on debt for the wrong reasons. The paradox is that while people achieve status through what they own, they are rarely aware that people are more interested in their lives than in the assessment of other people based on what they have. The "man in the car" metaphor is quite potent. It puts into the picture that wealth is not a precursor to respect, or admiration just shines light on the objects themselves. This has a way of helping to refocus the reader's attention from materialism and towards more intrinsic goals that do not rely on social approval or external validation. Housel's message about how status is transitory is also strong. The idea that your status is often shallow and external encourages the reader to seek fulfilment in ways that are less dependent on the perception of others. It makes them ask themselves whether their purchases or financial decisions are for their satisfaction or to impress others. Largely, *Man in the Car Paradox* is a very informative chapter that combines practical and psychological insights into status in personal finance. It challenges the reader to reevaluate what constitutes success and wealth, encouraging financial decisions that come from within one's own set of values, rather than through the pursuit of external validation and fleeting status symbols. The chapter reiterates the general themes of the book, reminding us that true wealth has nothing to do with what we own or how we are perceived by others but everything to do with how we feel about ourselves and the life we create for ourselves.

Chapter 9; *Wealth is What You Don't See*, is a critical exploration of the hidden nature of wealth and a sobering reminder that true financial security is not about flaunting what you have, but about what you can save, invest, and keep. Housel does a brilliant job of questioning conventional thinking on what it means to be "rich". The chapter is a scathing critique of our culture's obsession with visible wealth, how material possessions and outward signs of success often hide the truth about financial well-being. The central insight of this chapter is, that wealth is much more about what people don't display than what they do—pushes one's focus on financial success away from external validation toward more sustainable and less visible markers of financial health. Housel is saying, then, that it is true wealth that comes from the ability to accumulate and retain assets that can provide long-term financial freedom and security, even if such does not come with flashy displays of affluence. One of the strengths of this chapter is its ability to reframe how we think about success. By showing that wealth doesn't have to be showcased to be real, Housel helps readers realize that it's okay to reject societal pressures to spend and instead focus on long-term financial health. This message can help shift the mindset of people who feel pressured to overspend or "keep up with the Joneses" into a more sustainable path toward financial wellness. Housel also discusses the differentiation between income and wealth, the tendency to confound the two, and the need for saving and investment rather than a high-income earner. This would be valuable knowledge for readers to understand the concept of financial discipline toward building long-term wealth rather than just earning capability or apparent successful displays. Collectively, *Wealth is What You Don't See* refers to an incisive chapter making it crystal clear that the way to quiet, invisible wealth transcends any materialistic expression. It gives readers the alternative definition of becoming rich enough and guides readers not to pursue brief markers of success but rather aim for long-term financial stability. Housel's writing continues to challenge conventional ideas about money and provides a refreshing perspective on what it means to live a financially healthy life. This chapter reminds one that financial success is not about the way



to flaunt your resources but what you hold and how you keep them.

Chapter 10; Save Money, is a no-nonsense, practical guide to one of the most foundational concepts in personal finance. Housel's straightforward approach makes it clear that saving is not just a financial strategy, but a mindset and a key component of long-term financial success. Housel offers a refreshing alternative to the commonly complicated and high-risk strategies for building wealth that dominate financial media and consultants by focusing on saving. What stands out in this chapter is Housel's emphasis on the power of saving over earning more. The former may indeed make it easier to accumulate wealth because of a higher income; however, saving is what matters, especially saving a portion of what you earn, to attain financial stability. That insight is quite valuable because most people tend to increase their income without attending to how they spend. This makes Housel saner, as he makes the point, that saving is the most reliable, irrespective of income level, "living below your means". The common thing about savings can be more effective than many of the most complex investment strategies. Another valuable point about the chapter is Housel's discussion of the psychological benefits of saving, especially when it comes to flexibility and freedom. The fact that you can make financial decisions based on what you want, rather than on what you need, is a form of independence that few people realize is possible through the act of saving. This idea lines up with the broader themes of the book as it relates to long-term thinking, patience, and the pursuit of financial freedom. Housel makes the point pragmatic and accessible; he says it is not that big investments and major career changes are always about becoming wealthy, but also about being steady and making consistent choices between saving and spending. He shows readers how modest savings can lead to large returns over time and enable them to live a higher quality of life with practical tools on how to rethink their financial strategies. In sum, *Save Money* is one of the critical chapters. It reminds us that accumulating wealth does not demand extraordinary money expertise or large

windfalls; it demands discipline and patience as well as getting into the habit of saving. Housel's very lucid writing offers practical wisdom to someone looking to create a more secure and fulfilling financial future, with this chapter of the book becoming one of the most useful and actionable chapters in it.

Chapter 11; Reasonable > Rational, is one of the most insightful and relatable chapters in *The Psychology of Money*. Housel's focus on personalizing financial decisions to fit one's unique psychology is a powerful reminder that there is no "one size fits all" when it comes to managing money. This chapter challenges the traditional idea that financial success can only be achieved through rational decision-making and highlights the importance of balancing logic with emotional comfort. The way Housel emphasizes being aware of yourself in financial planning makes the chapter more interesting. Financial principles such as diversification, risk management, and long-term investment are valuable principles, but they might not resonate with many people's levels of risk or goals. He encourages readers to realize that their circumstances, preferences, and even emotional responses about money are real and must be considered in a decision. The idea that reasonable decisions are often more sustainable and emotionally fulfilling than purely rational ones is especially important in the context of personal finance. Many people are drawn to high-risk, high-reward financial strategies because they seem rational, but if those strategies cause too much stress or anxiety, they are likely to backfire in the long run. Housel's approach calls for more balanced and benevolent thinking around money, where an individual is empowered to make decisions based on his own comfort and value system. This chapter also talks about the flexibility of financial planning. Being "reasonable" does not mean being rigid or inflexible; it means adapting strategies based on what works best for you in your unique situation. Housel's advice is particularly useful for those who may feel overwhelmed or paralyzed by the pressure to follow conventional financial wisdom or to meet societal expectations about money and success. Altogether, *Reasonable > Rational*, is a practical chapter



that makes readers think about their way of managing finances differently. It calls out individuals to realize how personal comfort, values, and goals must become the basis of financial decisions, contrary to previous interpretations. It tells us that being smart with money must be balanced by being able to live with our decisions in the long run.

Conclusion

The book explores the role of behaviour in financial success and provides readers with an invaluable framework for understanding the emotional and psychological forces that drive financial behaviour. Housel's insights challenge the traditional focus on technical financial strategies and instead highlight the importance of personal habits, mindset, and values. The sections emphasize patience, long-term thinking, and the power of saving, while also urging readers to embrace the unpredictability of life and markets. Housel's clear, relatable writing makes these concepts accessible, and his focus on the emotional aspects of money encourages readers to rethink their financial goals and decisions.

Through these eleven chapters, Housel makes a compelling case that financial success is not just about intelligence or luck, but about cultivating the right mindset, making decisions based on personal values, and understanding the long-term impact of small, consistent actions. The key takeaway is that wealth is less about acquiring material possessions and more about creating a life where financial decisions align with personal happiness and freedom.

Though the book offers valuable insights into the role of behaviour in financial success, it has some shortcomings. A limitation is that it primarily focuses on personal finance through anecdotes rather than in-depth research or data-driven analysis. The book effectively highlights psychological biases and the importance of patience and discipline, nevertheless, it lacks concrete strategies for overcoming these biases. Additionally, it could have explored external factors such as economic policies, market structures, and systemic inequalities that also shape financial outcomes. A broader discussion on these topics would have provided a more comprehensive understanding of money and decision-making.

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