Global Financial Crisis at Indian Banks and Non – Banking Financial Companies

Debonita Laha

Roll No. – 11A

M.A. Economics 2023-2025

May 27, 2025.

Under the supervision of

Dr. Triptendu Prakash Ghosh

Indian Institute of Foreign Trade, Kolkata

This final report of my dissertation is submitted in partial fulfillment for the degree of M.A. Economics at the Indian Institute of Foreign Trade, Kolkata

Abstract

This dissertation examines how the 2008 Global Financial Crisis (GFC) affected Indian banks and non-banking financial companies' (NBFCs') resilience and financial performance. Return on equity (ROE) and return on assets (ROA) are the main measures of financial health in this econometric study, which uses panel data from 2005 to 2020 that covers 31 banks and 29 NBFCs. Important changes in profitability trends, interest rate exposure, and macroeconomic sensitivity are revealed by contrasting the pre- and post-GFC eras for both types of financial institutions. After the crisis, Indian banks showed improved regulatory alignment, increased performance persistence, and increased sensitivity to macroeconomic factors—all of which were indicative of the impact of post-crisis reforms. However, due primarily to firm-level factors and relative isolation from the overall state of the economy, NBFCs continued to exhibit inconsistent ROE performance despite improvements in ROA stability. Banks and NBFCs have different crisis response and recovery paths, according to the study, which emphasizes the need for unique, risk-sensitive regulations to maintain systemic resilience without limiting financial sector innovation.

Keywords: Global Financial Crisis, Indian Banking Sector, Non-Banking Financial Companies, Return on Assets (ROA), Return on Equity (ROE), Financial Resilience, Macroeconomic Sensitivity, Panel Data Analysis, Capital Adequacy, Regulatory Policy, Systemic Risk

Table of Contents

Introduction

The most prominent flashpoint of the Global Financial Crisis (GFC) of 2008, the worst economic downturn since the Great Depression, was the fall of **Lehman Brothers** in September of that year. The crisis began in the United States when the subprime housing bubble burst, and it was brought on by a surge in high-risk mortgage loan defaults. Financial institutions around the world suffered enormous losses as a result of these defaults, which spread throughout the financial system, particularly through intricate and opaque financial products like **mortgage-backed securities** (MBS).

Due to the interdependence of global financial markets, the crisis swiftly transformed from what was initially perceived as a domestic housing and mortgage market problem into a systemic financial collapse. The crisis spread from developed economies to emerging markets through the use of international banks, trade, and capital connections as transmission channels. The global financial sector experienced a severe liquidity crunch, disruption of credit flows, and a crisis of solvency as a result of the collapse in investor confidence and the concurrent decline in asset prices.

The **undercapitalization of banks**, **inadequate risk management procedures**, and the perils of an **over-reliance on financial innovations** whose risks were not fully understood were among the major weaknesses in the world's financial systems that the crisis revealed. When defaults started to accumulate, it became evident that traditional bank loans posed just as serious a risk as securitization, especially because of the delayed visibility of losses on balance sheets.

India was not immune, despite being somewhat shielded by its comparatively conservative financial system and low exposure to subprime assets. Significant indirect effects were experienced by the Indian financial sector, particularly by banks and Non-Banking Financial Companies (NBFCs). The GFC affected Indian banks and NBFCs primarily through two transmission channels:

1. Growing Demand Shock-Related Non-Performing Assets (NPAs)

- **The Impact of Demand**: Demand both domestically and internationally fell precipitously as a result of the GFC, which had a negative effect on company earnings. The frequency of loan defaults rose as businesses found it difficult to pay off debt.
- **Effect on Banks and NBFCs**: This led to a sharp increase in non-performing assets (NPAs), which had an immediate impact on asset quality and profitability. Higher provisioning was also required due to the increase in defaults, which put additional strain on institutions' financial stability.
- **Decreased Asset Valuation**: Asset prices in industries such as real estate fell, resulting in write-downs and impairments that further weakened financial institutions' balance sheets.

2. The Challenge of Obtaining Equity Capital

- **Stock Market Crash:** Banks and NBFCs found it difficult to raise new capital due to a significant global stock market downturn.
- **Impact on Capital Adequacy Ratios (CAR):** It became challenging to maintain appropriate CAR as a result of declining equity valuations and limited access to capital markets. This presented threats to systemic stability and reduced financial institutions' capacity to withstand losses.

Indian banks proved to be more **resilient** than their international counterparts in spite of these difficulties. This can be explained by elements like a more cautious lending approach in the past, increased regulatory oversight by the Reserve Bank of India (RBI), and less direct exposure to toxic assets.
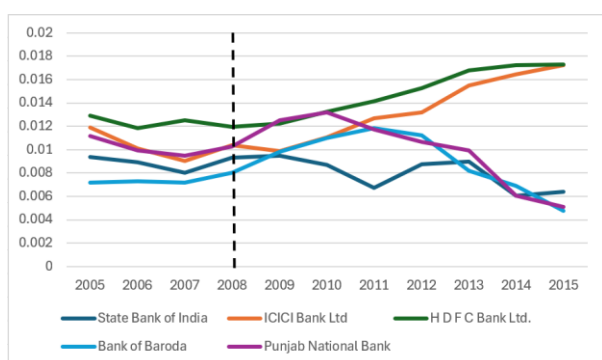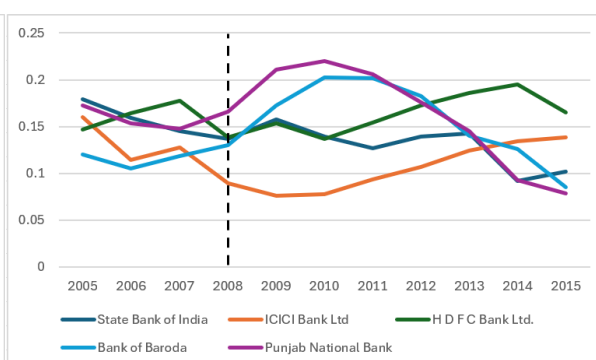

Fig 1. ROA of 5 largest banks   *Fig 2. ROE of 5 largest banks*

One important financial metric that shows how well a bank uses its assets to produce profits is Return on Assets (ROA), which is also a helpful indicator of financial resilience. Stronger operational performance and the ability to tolerate economic shocks, especially during financial crises, are indicated by a higher ROA. **Report on Trend and Progress of Banking in India 2008-09, Reserve Bank** mentions *"Return on Assets (RoA) is an indicator of efficiency with which banks deploy their assets. During 2008-09 the RoA increased of all the bank groups, except the foreign banks."*. It gives stakeholders a uniform perspective on profitability and makes it possible to make insightful comparisons between banks of all sizes. The ability of a bank to produce profits from shareholders' equity, which reflects both profitability and effective resource use, makes Return on Equity (ROE) a crucial metric for assessing bank resilience. **Report on Trend and Progress of Banking in India 2008-09, Reserve Bank** mentions *"Return on Equity (RoE), is an indicator of efficiency with which capital is used by banking institutions. The RoE of SCBs increased to 13.2 per cent during 2008-09 from 12.5 per cent in 2007-08."* Strong risk mitigation and financial management are indicated by a continuously high or stable ROE, especially during recessions. ROE should not, however, be interpreted in a vacuum because it can be distorted by elements such as excessive leverage or shifting regulatory and economic circumstances. Therefore, to obtain a thorough grasp of a bank's

general health and resilience to financial stress, ROE works best when combined with other financial metrics and contextual analysis.
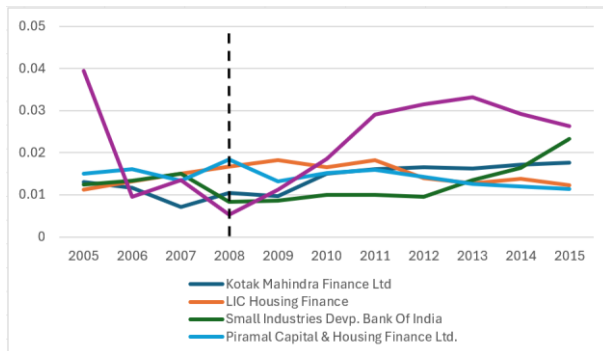

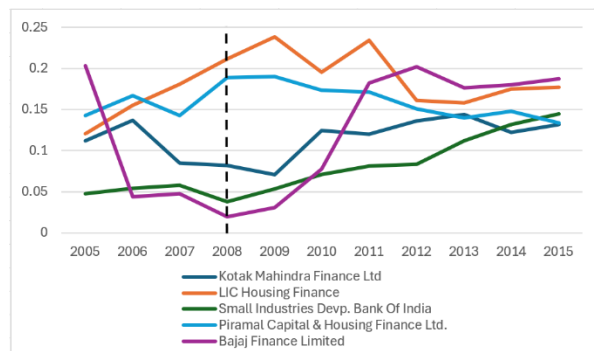Fig 3. ROA of 5 largest NBFCs

Fig 4. ROE of 5 largest NBFCs

Non-Banking Financial Companies' (NBFCs') ability to effectively use assets to generate profits—a crucial characteristic for both operational stability and financial health—is reflected in return on assets (ROA), which is a key indicator of resilience. Strong asset management and the ability to withstand economic stress are indicated by a high or stable ROA. For NBFCs, which frequently have fewer resources than traditional banks, this is especially crucial. However, because ROA ignores outside variables like market volatility and regulatory changes, it might not adequately reflect an NBFC's resilience. For a complete picture of financial stability, it should therefore be examined in conjunction with other financial indicators.

As a measure of how well Non-Banking Financial Companies (NBFCs) turn shareholders' equity into profits, return on equity (ROE) is a helpful indicator of resilience that reflects both operational effectiveness and financial health. An NBFC may be able to maintain profitability even in times of economic downturn if its ROE is high or consistent. Additionally, it makes it possible to compare different companies, which aids in determining which are better able to adjust to changes in the market. However, high leverage can distort ROE, so it needs to be viewed in the larger framework of the economy and financial situation.

Objective

The goal of this dissertation is to investigate how the 2008 Global Financial Crisis (GFC) affected the Indian financial sector, with an emphasis on the stability and difference in performance of Indian banks and non-banking financial companies (NBFCs). Understanding how these two categories of financial institutions were impacted by the crisis and how they adjusted and responded in its wake is the aim of this study.

The financial performance metrics **Return on Equity (ROE)** and **Return on Assets (ROA)** form the foundation of this dissertation's analytical framework. The pre-crisis and post-crisis performance of Indian banks and NBFCs is evaluated using these metrics, which act as stand-ins for profitability and asset and capital deployment efficiency. The study intends to uncover the operational effects of the Great Financial Crisis (GFC) and any long-term changes in

institutional behavior or financial health by following the trajectory of these indicators over time.

This study's empirical component is based on a large dataset that includes 29 NBFCs and 31 banks that operate in India. The years before, during, and after the crisis have all been included in the multi-year study (from year 2005-2020) of these institutions. This makes it possible to analyze performance over time, identifying not only the crisis's initial shock but also the patterns of recovery and subsequent structural changes.

The following is a summary of the study's main goals:

- to use **ROA** and **ROE** as the main metrics to assess how the 2008 Global Financial Crisis affected the financial performance of Indian banks and NBFCs.
- to find notable shifts in profitability, asset utilization, and equity performance by contrasting the internal financial dynamics of banks and NBFCs prior to and following the crisis.
- to compare the resilience, adaptability, and post-crisis financial recovery of banks and NBFCs.

Literature Review

According to theory, a financial crisis could affect a company's capital structure in a number of ways. In times of crisis, both lenders and borrowers are reluctant to lock in capital in long-term investments as uncertainty and risk increase and expected returns decrease. Lenders view a rise in default probabilities as a significant increase in the term premium at which they are willing to lend during a crisis, making short-term debt more appealing than long-term debt. (**Gürkaynak and Wright, 2012; Dick, Schmelling and Schrimpf, 2013**)

Due to its strong operational performance, decreasing asset impairment, and strong capital buffers, the Indian banking system has remained resilient. Macro stress tests show that even in the worst-case situation, banks' total capital would stay above the legal minimum. Despite maintaining a healthy balance sheet and profitability, the NBFC sector saw strong credit growth. The level of interconnectedness among financial sector entities has been increasing in terms of bilateral exposures. (**Financial Stability Report, Reserve Bank of India, 2024, pg-78**)

The results of the study by **Asli Demirguc-Kunt, Maria Soledad Martinez-Peria, and Thierry Tressel (2015)** are in line with the body of research that highlights how an established financial system and the institutional environment affect the capital structures of businesses. Their findings specifically imply that, although in different ways for SMEs and publicly traded companies, having a robust institutional environment and a deep banking system helps lessen the negative effects of financial and economic volatility.

A global financial crisis that affected the banking sector globally was brought on by Lehman Brothers' collapse in September 2008. The outlook for the banking industry remained uncertain

even though rescue efforts helped prevent the worst-case scenarios and markets started to normalize in Q2 2009. The effects of the crisis were lessened by proactive central bank and government actions. The banking system's resurgence was predicted to be aided by a worldwide economic recovery in 2010. **(Trade and Progress in Banking, Reserve Bank of India, 2008-09, pg-25)**

In India's financial system, NBFIs are essential because they both compete with and complement banks. NBFCs faced liquidity constraints as a result of the global financial crisis of 2008. In response, the Reserve Bank of India (RBI) implemented additional steps to improve NBFC liquidity, including the introduction of a special repo facility under the LAF for banks to fund NBFCs. AIFIs were given access to refinance facilities, and EXIM Bank and NHB's limits were increased. FIs performed well, and the quality of their assets increased. The RBI gradually strengthened NBFI regulation prior to the crisis, implementing measures pertaining to asset classification, exposure standards, and CRAR. While PDs' profitability increased, their balance sheet size decreased. **(Trade and Progress in Banking, Reserve Bank of India, 2008-09, pg-190)**

Anand Sinha's paper explores the effects of the global financial crisis (GFC) on banking globalization, with particular attention to shifts in foreign bank ownership, cross-border lending, and financial integration. The study adds banking trends from 1995 to 2013 to earlier datasets, capturing significant changes in post-crisis global banking structures.

The impact of the Global Financial Crisis (GFC) on banking globalization is examined in the paper **by Stijn Claessens** and **Neeltje van Horen**, with a focus on foreign bank ownership, cross-border lending, and financial integration. Key changes in the dynamics of international banking are captured by the authors' extension of earlier bank ownership datasets (1995–2009) to data up to 2013.

Securitization was initially blamed for the financial crisis due to the high visibility of losses on subprime securities. However, by mid-2009 it became clear that securitization was not the main culprit. The stringent accounting requirements for securities made losses visible early on, while potential losses on loans could be hidden for several quarters. **(Jayanth R Varma, Vikalpa, Volume 34, No-3, July, September 2009)**

Methodology

In order to investigate the disparate effects of the Global Financial Crisis (GFC) on the financial stability and performance of Indian banks and non-banking financial companies (NBFCs), this study uses a quantitative, empirical methodology. A thorough comparison of the pre-crisis and post-crisis eras is made by using econometric modeling based on financial and macroeconomic data from 2005 to 2020.

I. Time Frame and Segmentation of the Crisis

The time frame is divided into two separate stages:

- Time frame prior to the crisis: 2005–2008
- Time frame post the crisis: 2009–2020

This division corresponds with the 2008 Global Financial Crisis timeline, which was characterized by Lehman Brothers' September 2008 collapse and the ensuing fallout for Indian and international financial institutions.

II.   Data collection

A sample of 31 NBFCs and 29 Indian banks was selected based on data availability and representativeness across various institution sizes and types. The information includes both specific macroeconomic indicators and financial metrics at the institution level. The list of the banks from which data was collected is as follows:

1. Axis Bank Ltd
2. City Union Bank Ltd
3. Dhanlaxmi Bank Ltd
4. Federal Bank Ltd.
5. H D F C Bank Ltd.
6. ICICI Bank Ltd
7. IndusInd Bank Ltd.
8. Karnataka Bank Ltd.
9. Karur Vysya Bank Ltd.
10. Kotak Mahindra Bank Ltd.
11. R B L Bank Ltd.
12. South Indian Bank Ltd.
13. C S B Bank Ltd.
14. Cosmos Co-Operative Bank Ltd.
15. D C B Bank Ltd.
16. I D B I Bank Ltd.
17. Tamilnad Mercantile Bank Ltd.
18. State Bank of India
19. Bank of Baroda
20. Bank of India
21. Canara Bank
22. Central Bank of India
23. Indian Bank
24. Indian Overseas Bank
25. Bank Of Maharashtra
26. Uco Bank
27. Union Bank Of India
28. Punjab & Sind Bank
29. Punjab National Bank

The list of the Non-banking financial companies are from which data was collected is as follows:

1. Bajaj Finance Limited
2. LIC Housing Finance
3. Mahindra & Mahindra Financial Services
4. Muthoot Finance
5. Sundaram Finance
6. IIFL Finance
7. Reliance Capital
8. Edelweiss Financial Services
9. Manappuram Finance
10. Srei Infrastructure Finance
11. Kotak Mahindra Finance Ltd
12. Aadhar Housing Finance Ltd.
13. Can Fin Homes Ltd.
14. Cent Bank Home Finance Ltd.
15. G I C Housing Finance Ltd.
16. I C I C I Home Finance Co. Ltd.
17. Ind Bank Housing Ltd.
18. India Home Loan Ltd.
19. Manipal Housing Finance Syndicate Ltd.
20. P N B Housing Finance Ltd.
21. Piramal Capital & Housing Finance Ltd.
22. Repco Home Finance Ltd.
23. S R G Housing Finance Ltd.
24. Sahara Housingfina Corpn. Ltd.
25. Mudit Finlease Ltd.
26. Nalin Lease Finance Ltd.
27. Punjab Kashmir Finance Ltd.
28. Shalibhadra Finance Ltd.
29. Small Industries Devp. Bank Of India
30. T M F Business Services Ltd.
31. Tamilnadu Urban Finance & Infrastructure Devp. Corpn. Ltd.

The data collection is done from financial websites such as CMIE Prowess, DBIE Database of the RBI and other authentic websites.

III. Variables used

As **dependent variables**, two important profitability metrics were employed. The variables Net profit, Total Asset, Paid-up Equity, Reserves and Surplus:

- Return on Assets (ROA) = Net Profit / Total Assets
- Return on Equity (ROE) = Net Profit / (Paid-up Equity + Reserves and Surplus)

The **independent variables** that were used in the models for the comparative study:

- Total Assets
- Capital Adequacy Ratio (CAR) [only available for banks]
- Non-Performing Assets (Net NPA) [only available for banks]

Macroeconomic variables taken in consideration:

- Rate of GDP Growth
- Rates of Bond Yield (10-year government securities)

Certain variables, like CAR and Net NPA, could only be included for banks due to the restricted availability of public data for NBFCs.

IV.   Model design

Using panel data regression techniques, a total of **8 econometric models** were built to examine the differences in the GFC's effects on banks and NBFCs. The models are divided into groups according to:

- Financial institution type: **NBFCs vs. banks**
- Time frame: **2005–2008** before the crisis versus **2009–2020** after the crisis.
- According to the dependent variables: **ROA** and **ROE.**

The models with **ROA** as its dependent variables

i.   For banks – both for pre and post time period of the crisis (2005-2008 and 2009-2020)
$$ROA_{it} = \beta_1 ROA_{L_{it}} + \beta_2 Net\,NPA_{it} + \beta_3 Capital\,Adequacy_{it}$$
$$+ \beta_4 Total\,Assets_{it} + \beta_5 GDP_{it} + \beta_6 Bond\,Yield_{it} + \delta_t + \mu_i + \in$$

ii.   For NBFCs - both for pre and post time period of the crisis (2005-2008 and 2009-2020)
$$ROA_{it} = \beta_1 ROA_{L_{it}} + \beta_2 Total\,Assets_{it} + \beta_3 GDP_{it} + \beta_4 Bond\,Yield_{it} + \delta_t$$
$$+ \mu_i + \in$$

The models with **ROE** as its dependent variables

i.   For banks – both for pre and post time period of the crisis (2005-2008 and 2009-2020)
$$ROE_{it} = \beta_1 ROE_{L_{it}} + \beta_2 Net\,NPA_{it} + \beta_3 Capital\,Adequacy_{it}$$
$$+ \beta_4 Total\,Assets_{it} + \beta_5 GDP_{it} + \beta_6 Bond\,Yield_{it} + \delta_t + \mu_i + \in$$

ii.   For NBFCs - both for pre and post time period of the crisis (2005-2008 and 2009-2020)
$$ROE_{it} = \beta_1 ROE_{L_{it}} + \beta_2 Total\,Assets_{it} + \beta_3 GDP_{it} + \beta_4 Bond\,Yield_{it} + \delta_t$$
$$+ \mu_i + \in$$

V. Model Validation

Every model was tested for **Multicollinearity** between the independent variables in order to validate it. Potential multicollinearity was identified using Variance Inflation Factor (VIF) diagnostics, and where required, the proper corrective action was implemented. Furthermore, using pertinent statistical techniques, the existence of **Endogeneity** among the explanatory variables was examined. When endogeneity was found, lagged instrumental variables were used to fix the problem and guarantee the estimators' impartiality and consistency.

To choose between fixed effects and random effects for panel data regression models, the **Hausman test** was used. The best model was chosen in light of the findings to guarantee precise estimation and reliable inference. The purpose of these methodological actions was to strengthen the validity and reliability of the empirical results.

Results

1. Comparative Analysis of Pre-GFC vs Post-GFC Bank ROA Determinants

$$ROA_{it} = \beta_1 ROA_{L_{it}} + \beta_2 Net\ NPA_{it} + \beta_3 Capital\ Adequacy_{it} + \beta_4 Total\ Assets_{it} + \beta_5 GDP_{it} + \beta_6 Bond\ Yield_{it} + \delta_t + \mu_i + \in$$

Econometric Considerations

- With 116 observations and no endogeneity detected, the pre-GFC model employed **fixed-effects** estimation. Here we do not employ any instrumental variable.
- With 290 observations, the post-GFC model employed **IV-FE (2SLS) estimation**, instrumenting **L_ROA** and **Net_NPA** with **L2.ROA** and **L.Net_NPA.**

The coefficients can be summarized in a table

Variable	Pre-GFC	Post-GFC	Change in Significance
L_ROA (Lagged ROA)	-0.0615 (p=0.045)**	0.7176*** (p=0.000)	Became highly significant (with IV)
Net_NPA	-0.0034** (p=0.006)	-0.0011 (p=0.108)	Became insignificant (with IV)
Total_Assets	-7.02e-09 (p=0.352)	-4.64e-10 (p=0.612)	Remained insignificant
GDP	8.95e-10 (p=0.515)	-5.11e-10 (p=0.209)	Remained insignificant
bond_yield	-0.0029* (p=0.098)	-0.0019** (p=0.005)	Became more significant post-GFC

Variable	Pre-GFC	Post-GFC	Change in Significance
Capital_Adequacy	0.00018*** (p=0.005)	-1.47e-06 (p=0.987)	Lost significance

Examining Variable Significance Changes in Detail:

- **ROA Lagged (L_ROA)** - Under instrumental variable (IV) estimation, the impact of previous profitability on present performance grew dramatically after the Great Financial Crisis (GFC), going from weakly negative to strongly positive. *This suggests improved performance persistence, which is probably the result of post-crisis strategic conservatism and more stable earnings practices.*

- **Net_NPA, or net non-performing assets** - Net Prior to the crisis, NPA significantly lowered ROA; however, after the Great Financial Crisis, its impact diminished and was no longer statistically significant. *This implies that the effect of non-performing assets (NPAs) on profitability was mitigated by better asset quality management or regulatory actions.*

- **Total Assets** - Neither period's performance was significantly impacted by the size of banks as indicated by their total assets. *This suggests that economies of scale did not result in increased returns, perhaps as a result of post-crisis efficiency gains waning or regulatory burdens.*

- **GDP** - GDP In both periods, macroeconomic growth (GDP) did not significantly influence bank profitability, suggesting a *decoupling of national economic performance from the performance of individual banks*, particularly in the post-crisis environment where internal risk was given more attention.

- **Bond Yield** - After the Great Financial Crisis, bond yields became a more important factor in determining ROA, and sensitivity to interest rates rose. As a result of changing monetary policy and asset-liability strategies, *this indicates increased interest rate exposure and reduced margins.*

- **Capital Adequacy Ratio** - Prior to the Great Financial Crisis, capital adequacy significantly improved performance, perhaps indicating caution and market confidence. *This function diminished after the Great Financial Crisis, when capital was no longer a strategic differentiator but rather a regulatory necessity.*

Structure of Banking Business Models

i. **Performance Persistence**: The sharp rise in L_ROA's effect suggests that bank performance has stabilized since the Great Financial Crisis, indicating reduced volatility and stricter controls.

ii. **Size Irrelevance:** Total Assets' lack of significance suggests that scale economies shrank, possibly as a result of stricter regulations or changes in cost structures.

iii. **Sensitivity to Interest Rates:** Bond yields had a big impact after the crisis, indicating increased susceptibility to monetary policy.

iv. **The capital effect disappears:** Its ability to forecast profitability decreased as capital regulations became more uniform, which may have been a reflection of uniform compliance

2. Comparative Analysis of Pre-GFC vs Post-GFC Bank ROE Determinants

$$ROE_{it} = \beta_1 ROE_{L_{it}} + \beta_2 Net\ NPA_{it} + \beta_3 Capital\ Adequacy_{it} + \beta_4 Total\ Assets_{it}$$
$$+ \beta_5 GDP_{it} + \beta_6 Bond\ Yield_{it} + \delta_t + \mu_i + \in$$

Econometric Considerations

- With 116 observations and no endogeneity detected, the pre-GFC model employed **fixed-effects** estimation. Here we do not employ any instrumental variable.
- With 290 observations, the post-GFC model employed **IV-FE (2SLS) estimation**, instrumenting **L_ROE** and **Net_NPA** with **L2.ROE** and **L.Net_NPA.**

The coefficients can be summarized in a table

Variable	Pre-GFC	Post-GFC	Change in Significance
L_ROE	-0.1247*** (p = 0.000)	0.8199*** (p = 0.000)	Became positive and highly significant (with IV)
Net_NPA	-0.0702** (p = 0.010)	-0.0072 (p = 0.595)	Became insignificant (with IV)
Total_Assets	-3.26e-07* (p = 0.072)	-7.31e-09 (p = 0.693)	Lost marginal significance
GDP	1.78e-08 (p = 0.509)	-1.57e-08** (p = 0.044)	Became significant and changed sign
bond_yield	-0.0245 (p = 0.564)	-0.0477*** (p = 0.000)	Became significant post-GFC
Capital_Adequacy	-0.0015 (p = 0.291)	0.0010 (p = 0.622)	Remained insignificant

Examining Variable Significance Changes in Detail:

• **ROE Lagged (L_ROE)** - After the Great Financial Crisis, L_ROE's sign changed and became firmly positive. As a result of improved regulatory oversight, business model maturity, and institutional consolidation in the banking sector, this points to *a shift in profitability from volatility or mean reversion prior to the crisis to performance persistence following it.*

• **Net NPA** - Before the crisis, NPAs had a negative and significant impact on ROE; however, even after endogeneity was taken into account, the effect lost both magnitude and significance after the Great Financial Crisis. This decrease is probably the result of *better asset quality controls, post-crisis restructuring frameworks, or provisioning standards.*

• **Total Assets** – Prior to the crisis, bank size had a slight negative impact, but after the Great Financial Crisis, this effect vanished entirely. This change implies that *scale effects were lessened*, most likely as a result of stricter lending standards and higher regulatory capital requirements that offset any size-based benefits.

• **GDP** - After the Great Financial Crisis, GDP changed from being a negligible predictor of ROE to a significant negative predictor. This contradictory relationship might be the result of *banks using countercyclical lending tactics or of the post-crisis regulatory environment's growing susceptibility to macroeconomic restraints.*

• **Bond Yield** - Bond yields became a significant factor in determining bank profitability after the Great Financial Crisis. Increased interest rate sensitivity is indicated by the stronger negative relationship, which could be *the result of a greater reliance on market borrowings or regulatory lending rate caps.*

• **Capital Adequacy** Ratio - Despite a shift in sign, capital adequacy was not significant in either period. This implies that regulatory minimum capital requirements might have created a level playing field, lowering the variance in capital ratios and their impact on profitability.

Structure of Banking Business Models

i.   **Profitability Dynamics:** The change in performance persistence from negative to positive indicates that earnings patterns in the banking industry have stabilized since the Great Financial Crisis.

ii. **Risk Exposure:** The new sensitivity to macro factors (bond yields, GDP) and the lessened impact of non-performing assets (NPAs) point to a reallocation of risk exposures, which may be prompted by regulatory reforms.

iii. **Interest Rate Sensitivity**: According to post-Great Financial Crisis models, banks are growing more susceptible to monetary tightening, and bond yields are now a statistically and economically significant factor.

3. Comparative Analysis of Pre-GFC vs Post-GFC NBFC ROA Determinants

$$ROA_{it} = \beta_1 ROA_{L_{it}} + \beta_2 Total\ Assets_{it} + \beta_3 GDP_{it} + \beta_4 Bond\ Yield_{it} + \delta_t + \mu_i + \in$$

Econometric considerations

According **to Durbin-Wu-Hausman tests**, neither L_ROA nor Total_Assets showed any endogeneity, confirming the application of a consistent fixed-effects framework for both time periods.

- Without the use of any instrumental variables, the pre-GFC model employed **fixed-effects estimation** with 124 observations across 31 NBFCs.
- Without the use of any instrumental variables, the post-GFC model employed **fixed-effects estimation** with 372 observations across 31 NBFCs.

The coefficients can be summarized in a table

Variable	Pre-GFC	Post-GFC	Change in Significance
L_ROA	-0.5050*** (p = 0.000)	0.0513** (p = 0.015)	Became positive and significant
Total_Assets	-3.32e-06 (p = 0.365)	-1.82e-07 (p = 0.363)	Remained insignificant
GDP	2.04e-08 (p = 0.619)	-5.99e-10 (p = 0.903)	Remained insignificant
bond_yield	0.0130 (p = 0.389)	-0.0142 (p = 0.262)	Remained insignificant; sign flipped

Examining Variable Significance Changes in Detail:

- **L_ROA** - Prior to the crisis, NBFCs with higher historical ROA tended to have lower current ROA, indicating performance volatility or mean reversion. The coefficient became positive and significant after the Great Financial Crisis, *suggesting improved stability and performance persistence*. This could be due to tighter regulations, better governance, or the sector's maturing business models.
- **Total_Assets** - During both periods, there was no discernible correlation between bank size (as determined by total assets) and profitability. This suggests that there is no

evidence of scale advantages or diseconomies, which could be because *NBFCs of all sizes have uniform asset portfolios or a comparatively flat cost structure.*

- **GDP** - NBFC profitability was not statistically impacted by GDP during either period. This implies that NBFC performance stayed mostly independent of macroeconomic swings, most likely *as a result of their reliance on non-cyclical credit market segments or their use of niche lending techniques.*
- **bond_yield** - In both periods, bond yields were statistically insignificant. However, the influence's direction changed from positive to negative, suggesting that interest rate sensitivity may have changed. This could be *the result of modifications to NBFC funding arrangements, a rise in market borrowing, or a change in investment tactics brought about by monetary policy changes.*

Structure of NBFC Business Models

i.   **Profitability Stabilization:** The reversal of the L_ROA coefficient to a positive and significant value after the Great Financial Crisis suggests that NBFCs' profitability patterns became more stable and predictable, possibly as a result of better risk governance and controls.

ii. **Scale Neutrality:** The continued insignificance of total assets attests to the lack of significant scale effects in NBFC profitability prior to and following the Great Financial Crisis.

iii. **Macroeconomic Insulation:** Because of their sectoral focus or lack of reliance on conventional funding markets, NBFCs appear to have maintained a low level of direct exposure to macroeconomic drivers, as evidenced by the insignificance of GDP and bond yield over the two periods.

4. Comparative Analysis of Pre-GFC vs Post-GFC NBFC ROE Determinants

$$ROE_{it} = \beta_1 ROE_{L_{it}} + \beta_2 Total\ Assets_{it} + \beta_3 GDP_{it} + \beta_4 Bond\ Yield_{it} + \delta_t + \mu_i + \in$$

Econometric considerations

According to **Durbin-Wu-Hausman tests**, neither L_ROE nor Total_Assets showed any endogeneity, confirming the application of a consistent fixed-effects framework for both time periods.

• Without the use of any instrumental variables, the pre-GFC model employed **fixed-effects** estimation with 124 observations across 31 NBFCs.

• Without the use of any instrumental variables, the post-GFC model employed **fixed-effects** estimation with 372 observations across 31 NBFCs.

The coefficients can be summarized in a table

Variable	Pre-GFC	Post-GFC	Change in Significance
L_ROE	-0.0659 (p = 0.274)	-0.1706 (p = 0.499)	Remained negative and insignificant
Total_Assets	-1.36e-06 (p = 0.617)	3.85e-07 (p = 0.316)	Changed sign; remained insignificant
GDP	2.18e-08 (p = 0.395)	-8.37e-09 (p = 0.191)	Changed sign; remained insignificant
Bond_Yield	-0.0109 (p = 0.804)	-0.0077 (p = 0.727)	Sign unchanged; remained insignificant

Examining Variable Significance Changes in Detail:

- **L_ROE -** In both periods, L_ROE was negative and not statistically significant. This suggests that NBFCs have not been consistently profitable before or after the crisis, which may be due to erratic earnings trends or inadequate performance monitoring systems in the NBFC sector as opposed to banks.
- **Total_Assets -** Although the coefficient's sign changed from negative to positive, it was still statistically insignificant. Due to the regulatory caps that restrict scale-based advantages and the heterogeneous nature of NBFCs, it appears that firm size (as indicated by total assets) had no discernible or consistent effect on ROE during either period.
- **GDP -** GDP remained statistically insignificant in both scenarios, but it shifted from being a positive to a negative predictor of NBFC profitability. Although the evidence is weak, this may indicate a rise in counter-cyclicality in NBFC lending practices or new macroeconomic constraints following the Great Financial Crisis.
- **Bond_Yield -** Since bond yields were not significant during either period, it is possible that NBFCs' funding mix—which includes less reliance on market borrowings and fixed-rate loans—made them less susceptible to changes in interest rates than banks.

Structure of NBFC Business Models

i. **Profitability Dynamics**: NBFCs appear to have weak earnings persistence, as evidenced by the lack of significance in lagged ROE over both periods. This could be due to management inefficiencies, limited capital buffers, or increased sectoral shock exposure in comparison to more regulated banking institutions.

ii. **Macroeconomic Sensitivity**: NBFCs, in contrast to banks, did not show statistically significant relationships with macro variables such as GDP or bond yields, indicating that firm-level or idiosyncratic factors were more important in determining profitability before and after the crisis.

iii. **Interest Rate Exposure**: Because of the use of non-market funding or fewer duration mismatches, the insignificant coefficients for bond yields imply that changes in interest rates had little effect on NBFC profitability.

Comparative Study of Banks and Non-Banking Financial Companies Based on Return on Assets (ROA)

Performance stability

Both banks and NBFCs experienced **stabilization** as a result of the GFC, although the mechanisms underlying this stabilization were different. The notable increase in performance persistence for banks is indicated by **the sharp rise in the coefficient of lagged ROA (L_ROA)** following the crisis. This implies **that more stringent rules, improved oversight, and strengthened internal controls implemented** in the wake of the crisis were the main factors that contributed to the increased predictability of bank profitability. A move toward more cautious, regulated, and risk-averse business models is reflected in the increased predictability. The reversal and significance of the L_ROA coefficient, on the other hand, show that NBFCs also saw **improved profitability stability** after the GFC. However, **internal advancements in risk governance** and **operational discipline** were more likely to be the cause of this stabilization than external regulation. NBFCs appear to have improved their credit evaluations and implemented more robust financial management procedures, which has helped them more withstand volatility.

Size Impact

Following the GFC, banks' use of size, as determined by total assets, underwent a significant shift. Large banks used to **benefit from scale economies that boosted profitability,** but data from the Great Financial Crisis indicates that total assets no longer significantly influenced ROA. This implies that **the benefits of size in terms of profitability were diminished by changes in regulations**, higher compliance costs, and a shift away from aggressive expansion. However, **scale was never a major consideration for NBFCs**, either prior to or following the crisis. The structural character of NBFC operations, which generally rely on sector-specific or localized lending and are therefore less reliant on size-driven efficiency, is highlighted by their consistent scale neutrality. The business models of **NBFCs are intrinsically more flexible and decentralized**, with minimal structural dependence on asset size, in contrast to banks, where size used to be a competitive advantage.

Macroeconomic sensitivity

Banks' heightened sensitivity to macroeconomic factors, especially interest rates, was a significant change following the Great Financial Crisis. Bond yields' substantial effect on ROA following the crisis implies that **banks were more vulnerable to shifts in monetary policy.** A larger allocation to interest-sensitive assets, such as government securities, or adjustments to funding costs and margins related to the interest rate environment could be the cause of this. However, both before and after the Great Financial Crisis, **NBFCs showed macroeconomic insulation.** The fact that neither GDP nor bond yields can adequately explain their return on assets (ROA) suggests a shift away from traditional funding markets and toward less cyclically sensitive industries. They appear to be **more protected from wider macroeconomic volatility** by their flexible lending practices, niche client segments, and sectoral dynamics, which drive their profitability.

Role of capital

Before the Great Financial Crisis, **banks' profitability was strongly influenced by their capital adequacy**. The uniform capital regulations brought about by post-crisis reforms like Basel III, however, **lessened the variance in capital levels among banks and rendered capital less relevant in elucidating ROA**. This points to a change in which preserving regulatory capital was no longer a competitive advantage but rather a necessary prerequisite. **Capital did not significantly affect NBFCs' profitability during either time.** This could be because NBFCs have historically been subject to a less stringent regulatory framework and have a wider range of funding sources (such as bank loans, securitization, and private placements), which makes capital adequacy less important for predicting performance.

Handling Crisis

Due to varying levels of regulatory oversight and public support, banks and NBFCs responded to the GFC in quite different ways. Significant government and central bank assistance, including **guarantees, liquidity injections,** and **bailouts**, was given to banks, especially those that were systemically important. Alongside these interventions, there was a significant regulatory overhaul that necessitated structural changes to **lending practices, asset allocation**, and **operations.** This included changes to capital and liquidity requirements as well as stress testing. On the other hand, the same degree of **direct intervention did not help NBFCs**. They responded to the crisis in a more natural way by using **leaner operations, more cautious lending,** and **internal reforms.** In certain markets, this increased their agility, but in other times (like the 2018 IL&FS crisis in India), it made them more vulnerable to liquidity stress.

Recovery trajectory

Banks had a slow and regulated recovery path. As a result of tighter lending standards, compressed margins, and high compliance costs, profitability eventually stabilized, albeit at lower levels. In order to counteract declining spreads, many banks also turned to non-interest revenue. By taking advantage of **pent-up demand** in the consumer and **SME segments** and the wave of digital lending, NBFCs, on the other hand, **recovered more quickly** in many

regions. But because some NBFCs took on more risk and leverage to pursue growth, this quicker recovery came with a higher risk exposure, which led to uneven results and vulnerabilities in liquidity crises. Because of their structural and strategic differences, **NBFCs saw faster but more brittle recoveries than banks**, which sought slower, more stable, and regulated recoveries.

Comparative Study of Banks and Non-Banking Financial Companies Based on Return on Equity (ROE)

Performance stability

Although in very different ways, the GFC had a substantial impact on the profitability dynamics of banks and NBFCs. A significant structural change is reflected in banks' performance persistence, which changed from negative to positive after the Great Financial Crisis. This shift implies that following the crisis, **banks' profits became steadier and more predictable**, most likely as a result of improved asset quality, stricter regulations, and more robust internal risk management systems. Stricter oversight and regulatory changes like Basel III were crucial in lowering return volatility and guaranteeing more steady earnings performance. NBFCs, on the other hand, demonstrated **poor earnings persistence throughout the pre- and post-GFC periods**, with lagged ROE remaining statistically insignificant. Weaker internal governance and a lack of capital may be the cause of this ongoing instability in profitability.

Macroeconomic Sensitivity

Banks' and NBFCs' responses to macroeconomic conditions clearly differed as a result of the GFC. Post-crisis models show that **banks are more sensitive to macroeconomic factors** like GDP and bond yields, indicating a deliberate reallocation of risk exposures. There is now a stronger correlation between bank performance and more general economic indicators as a result of these changes, which were probably brought about by regulatory pressures that pushed banks to reallocate their portfolios toward safer assets. Furthermore, the fact that non-performing assets (NPAs) have less of an impact indicates that risk management procedures improved after the Great Financial Crisis, further bringing profitability into line with external circumstances rather than internal asset quality issues. However, both before and after the crisis, **NBFCs were mainly immune to macroeconomic forces**. Their ROE revealed no statistically significant correlation with GDP or bond yields, highlighting the dominance of firm-level or idiosyncratic factors in determining their profitability. Alternative funding models, a focus on niche markets, or a lack of integration with official financial channels could all contribute to this insulation.

Interest rate sensitivity

The increasing interest rate sensitivity seen in banks following the Great Financial Crisis is another noteworthy change. Bond yields, which show heightened exposure to monetary policy tightening, emerged as a statistically and economically significant factor influencing bank

profitability. This pattern indicates shifts in bank balance sheet structure, which could be brought about by shorter asset-liability duration mismatches, more conservative lending practices, or larger holdings of government securities. Since the GFC, **banks have become more responsive to changes in the monetary environment**, highlighting the significance of interest rate management. The consistently insignificant coefficients for bond yields, on the other hand, showed that **NBFCs were not very sensitive to interest rates**. Their use of short-duration assets, non-market funding sources, or intrinsically reduced exposure to interest rate swings could all be responsible for this. Because of this, interest rate changes had little effect on NBFC profitability, protecting them from some of the risks associated with monetary tightening that banks faced.

Crisis handling

Because of their regulatory background and systemic significance, banks and NBFCs handled the GFC in very different ways. During the crisis, **rescue efforts were focused on banks, particularly those that were systemically important.** After receiving regulatory forbearance, liquidity injections, and government bailouts, they underwent a flurry of extensive reforms. In addition to restoring trust, these actions changed their lending, risk management, and reporting procedures, bringing stability to the system. NBFCs, on the other hand, were not given the same degree of direct assistance and **were forced to handle the crisis internally and with operational agility**. Flexibility was made possible by their less regulated status, but it also left them vulnerable to ongoing risks, particularly from funding disruptions and sectoral shocks. As a result, their crisis response was more dispersed and primarily reliant on firm-specific tactics as opposed to industry-wide regulatory guidelines.

Recovery trajectory

Banks and NBFCs had quite different post-GFC recovery paths. Regulatory compliance, balance sheet repair, and controlled risk exposure were the hallmarks of banks' gradual and organized recovery. As they **rebuilt capital and adjusted to a stricter regulatory environment**, their profitability gradually increased and they became more in line with monetary and macroeconomic trends. On the other hand, the recovery of NBFCs varied more; some companies recovered rapidly by entering highly sought-after niche markets, while others had difficulties because of operational inefficiencies or liquidity issues. Their recovery was **very firm-dependent and lacked the consistency** found in banks, which reflected the NBFC sector's decentralized and varied structure. Others remained vulnerable, particularly during periods of sectoral downturns or credit tightening, while others used agility and market gaps to grow after the crisis.

<u>Policy Implications</u>

Financial policymakers gained important insights from the Global Financial Crisis (GFC), which revealed significant weaknesses and behavioral differences between Indian banks and Non-Banking Financial Companies (NBFCs). External regulatory reinforcement, such as

capital adequacy standards and stricter oversight under Basel III, was the main factor behind the post-crisis stabilization of banks. This demonstrates how well macroprudential regulation strengthens systemic stability. Nonetheless, NBFCs' ongoing earnings volatility and firm-level sensitivities point to a regulatory weakness that needs immediate attention.

Implications for policy include:

- **Distinct but Coordinated Regulatory Frameworks:** Although NBFCs benefit from flexibility and niche-market adaptability, post-GFC and IL&FS-style crises show that their systemic risk is increased by a lack of strong regulation. Without limiting innovation, a tiered regulatory approach that is proportionate to the size and interconnectedness of NBFCs would aid in managing sectoral contagion.
- **Integrated Risk-Based Supervision**: Banks' interest rate exposure and post-Great Financial Crisis macroeconomic sensitivity point to the need for flexible, risk-sensitive supervisory instruments that adapt to shifting credit and monetary cycles. Internal governance standards, credit appraisal procedures, and liquidity risk management frameworks need to be reinforced for NBFCs, perhaps with the help of incentive-linked guidelines or regulatory prods.
- **Improvements to NBFCs' Capital and Liquidity Buffer:** As capital adequacy plays a crucial role in resilience but has little effect on NBFC profitability, capital requirements need to be reevaluated. The risk of systemic shocks and liquidity stress during downturns may be decreased by encouraging NBFCs to keep counter-cyclical buffers.
- **Crisis Preparedness and Resolution Mechanisms:** NBFCs do not enjoy the same benefits as banks, which are provided by implicit government backstops. To stop the spread of firm-level failures, India needs a formal, preemptive resolution framework for large NBFCs that includes structured liquidity support mechanisms and early warning systems.
- **Encouraging Responsible Innovation:** Promoting Responsible Innovation Technology and data-driven underwriting can enhance financial inclusion and efficiency, as evidenced by the quick digital-led recovery of some NBFCs following the Great Financial Crisis. It is essential to implement policies that encourage innovation while putting limits in place.

Conclusion

An important turning point in India's financial ecosystem was the Global Financial Crisis, which drastically changed the risk dynamics and operational characteristics of banks and NBFCs. NBFCs experienced a more natural but uneven transition characterized by internal reforms and entrepreneurial agility, whereas banks responded with a controlled, gradual path to profitability stabilization—driven by external mandates.

In contrast to NBFCs, which remained firm-specific, decentralized, and susceptible to idiosyncratic shocks, banks became more risk-averse, predictable, and policy-aligned, according to the comparative analysis based on Return on Equity (ROE) and Return on Assets (ROA). The different routes highlight a more general reality: both macro-level regulatory rigor and micro-level governance enhancements are necessary for systemic resilience in the Indian financial sector.

Importantly, the results show that although banks' growing adherence to macroeconomic indicators indicates their increased financial maturity, NBFCs' exclusion from these indicators indicates the boundaries of the current regulatory framework. A more balanced supervisory architecture is required in light of this divergence, one that guarantees NBFCs are not the weak link in a crisis while still giving them room to innovate and grow.

All things considered, the GFC served as a stress test that revealed the need for careful regulation of NBFCs while transforming India's banking industry into a more stable but regulated entity. In order to ensure that both sectors contribute robustly and sustainably to India's changing economic landscape, a forward-looking financial policy should seek to balance stability and flexibility.

Reference

1. **Report on Trend and Progress of Banking in India** for the year ended June 30, 2008, submitted to the Central Government in terms of Section 36(2) of the Banking Regulation Act, 1949, *Reserve Bank of India*.

2. **Report on Trend and Progress of Banking in India** for the year ended June 30, 2009, submitted to the Central Government in terms of Section 36(2) of the Banking Regulation Act, 1949, *Reserve Bank of India*.

3. **Financial Stability Report**, December 2024, Reserve Bank Published by Financial Stability Department, *Reserve Bank of India*.

4. "**The Impact of the Global Financial Crisis on Firms' Capital Structure**" by *Asli Demirguc-Kunt, Maria Soledad Martinez-Peria, Thierry Tressel*, Policy Research Working Paper 7522, *World Bank Group*, Development Research Group, December 2015.

5. "**Financial Crises: Causes, Consequences, and Policy Responses**" Ch-1, "Financial Crises: Explanations, Types, and Implications" by *Stijn Claessens* and *M. Ayhan Kose*.

6. "**Impact of the international banking crisis on the Indian financial system**" by *Anand Sinha.*

7. "**The Impact of the Global Financial Crisis on Banking Globalization**" by *Stijn Claessens and Neeltje van Horen,* IMF Working Paper, Research Department, October 2014.

8. "**Indian Financial Sector and the Global Financial Crisis**" by *Jayanth R Varma, Vikalpa,* Volume 34, No-3, July, September 2009.

9. "**Macroeconomics and the Term Structure**" by *S. Gürkaynak Jonathan H. Wright*

10. **"The Global Economic Crisis: Impact on India and Policy Responses"** by *Rajiv Kumar and Pankaj Vashisht*, ADBI Working Paper Series, No. 164, November 2009

11. **"Crisis in the Indian Non-Banking Finance Companies (NBFC) Sector"** by *Vijaya Kittu Manda, P. Sai Rani,* International Journal of Recent Technology and Engineering (IJRTE), ISSN: 2277-3878, Volume-8 Issue-4, November 2019

12. **"India's Financial System Building the Foundation for Strong and Sustainable Growth"** by *Alfred Schipke, Jarkko Turunen, Nada Choueiri and Anne-Marie Gulde-Wolf ,* 2023 International Monetary Fund Cover design: IMF Creative Solutions

13. **"The Crisis: Basic Mechanisms and Appropriate Policies"** by *Olivier Blanchard*, IMF Working Paper, Research Department, April 2009.