

# A Study on Bank Concentration using Herfindahl-Hirschman Index in the Indian Banking Sector

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**Abstract.** Bank concentration has re-emerged as a critical policy concern in emerging economies due to large-scale banking reforms, consolidation, and technological transformation. This study examines the extent and evolution of bank concentration in the Indian banking sector using the Herfindahl-Hirschman Index (HHI), focusing on three key balance-sheet indicators: total assets, deposits, and advances. Employing secondary data for 60 commercial banks comprising public sector, private sector, and foreign banks, over the period 1999–2024, the study provides a comprehensive assessment of concentration trends across ownership groups. The findings reveal a persistent decline in overall concentration at the aggregate level, indicating increased competition in the Indian banking system over time. However, disaggregated analysis uncovers notable heterogeneity across bank groups. Public sector banks consistently exhibit low concentration, while private sector banks show moderate, rising concentration, particularly in total assets and advances. Foreign banks also display moderate concentration, despite limited growth in market share. One-way ANOVA results confirm statistically significant differences in concentration levels across bank groups. The evidence suggests that structural transformation in Indian banking has shifted concentration dynamics away from public-sector dominance toward private-sector consolidation. These findings carry important policy implications for banking regulation, competition policy, and future consolidation strategies, highlighting the need for balanced regulatory oversight to ensure financial stability without undermining competitive efficiency.

**Keywords:** Indian Banking Sector, Bank Concentration, Herfindahl-Hirschman Index, Stability of Banking, Risk Management.

## 1. Introduction

The structure of the banking industry plays a critical role in shaping financial stability, competition, and economic growth. Bank concentration, which captures the extent to which a small number of banks dominate market activity, has long been a subject of debate in banking economics due to its implications for efficiency, risk-taking behaviour, and systemic stability (Structure-Conduct-Performance

hypothesis; Bain, 1951; Berger, 1995). While proponents of concentration-led stability argue that larger banks benefit from economies of scale, diversified portfolios, and superior risk management (Allen & Gale, 2004; Beck et al., 2006), critics contend that excessive concentration may weaken competition, encourage moral hazard, and amplify systemic risk (Boyd & De Nicolo, 2005).

The renewed focus on bank concentration in recent years is largely driven by large-scale financial sector reforms, banking consolidation, and post-crisis regulatory restructuring across both developed and emerging economies (Vives, 2016). In emerging markets, these dynamics are particularly significant, as banking systems often undergo rapid structural transformation alongside financial deepening and institutional reforms (Demirgüç-Kunt & Martinez Peria, 2010). The Indian banking sector provides a distinctive institutional setting to examine concentration dynamics. Since the initiation of financial sector reforms in the early 1990s, guided by the recommendations of the Narasimham Committee I (1991) and Narasimham Committee II (1998), India has pursued a gradual transition toward a more competitive, efficient, and resilient banking system. These reforms emphasised deregulation of interest rates, reductions in statutory pre-emption, the entry of private and foreign banks, and consolidation to achieve scale efficiency. Subsequent policy initiatives, including merger-led restructuring of public sector banks and regulatory strengthening following the global financial crisis, have further reshaped the structure of Indian banking (Reserve Bank of India [RBI], 2007; RBI, 2013).

Despite these reforms, the evolution of bank concentration in India remains ambiguous. On the one hand, increased participation of private and foreign banks and technological advancements have intensified competition, suggesting a decline in overall market concentration (Sinha et al., 2019; Bishnoi & Devi, 2017). On the other hand, consolidation among public sector banks and rapid asset expansion by a few large private banks indicate a possible re-concentration of market power within specific ownership segments (Dhawan & Niharika, 2021; Khan & Ahmad, 2022). These contrasting developments raise important questions regarding the true nature of concentration in Indian banking. Moreover, existing empirical studies often assess concentration using aggregate measures, potentially masking heterogeneity across ownership groups and balance-sheet dimensions such as total assets, deposits, and advances. Concentration patterns may differ substantially between the public sector, the private sector, and foreign banks due to differences in regulatory treatment, market strategies, and operational scale (Gulati & Singh, 2019; Ozili, 2018). A disaggregated, long-term analysis is therefore essential to capture the banking system's structural dynamics more accurately. Against this backdrop, the present study examines the level and evolution of bank concentration in the Indian banking sector using the Herfindahl-Hirschman Index (HHI), a widely accepted measure of market concentration (Jayant et al., 2015; Sharma & Bal, 2010). Using secondary data on 60 commercial banks across the public,

private, and foreign sectors over the period 1999–2024, the study provides a comprehensive assessment of concentration trends across multiple banking dimensions. By explicitly comparing concentration across ownership groups and testing differences using statistical techniques, the study contributes to the existing literature by offering nuanced insights into the structural transformation of Indian banking.

The findings of this study are expected to inform policymakers and regulators by highlighting whether consolidation and reform efforts have fostered competitive efficiency or led to renewed concentration risks. In doing so, the study adds empirical evidence to the ongoing debate on bank concentration and market structure in emerging economies.

## **2. Review of Literature and Research Gap**

### **2.1 Bank Concentration, Competition, and Financial Stability**

The relationship between bank concentration and financial stability has been a central theme in banking and industrial organisation literature. Early studies rooted in the Structure–Conduct–Performance (SCP) hypothesis argue that higher concentration enhances market power, allowing banks to earn monopoly rents and potentially improve stability through higher profitability and capital buffers (Bain, 1951; Berger, 1995). From this perspective, concentrated banking systems are considered more resilient to shocks due to economies of scale and better diversification. Contrary to this view, the competition-fragility hypothesis suggests that higher concentration may incentivise excessive risk-taking, as dominant banks face reduced competitive pressure and may engage in moral hazard, particularly when perceived as “too big to fail” (Boyd & De Nicoló, 2005). Empirical evidence on this relationship remains inconclusive, with cross-country studies showing that both concentrated and competitive banking systems can exhibit stability depending on regulatory quality and institutional frameworks (Beck et al., 2006; Allen & Gale, 2004). Recent literature emphasises that the impact of concentration on stability is context-specific and varies across banking structures, ownership patterns, and stages of financial development (Vives, 2016). This has shifted research focus toward country-specific and disaggregated analyses, particularly in emerging economies.

### **2.2 Measurement of Bank Concentration**

Empirical studies commonly measure bank concentration using structural indices such as the concentration ratio (CR-k) and the Herfindahl–Hirschman Index (HHI). Among these, the HHI is widely preferred due to its ability to capture both the number of banks and the distribution of market shares, making it a comprehensive indicator of market structure (Sharma & Bal, 2010). The HHI has been extensively applied in banking studies across different countries to assess competitive intensity

and structural change (Jayant et al., 2015). While most studies rely on a single indicator – typically total assets – to compute concentration, recent research highlights the importance of examining multiple balance-sheet dimensions, including deposits and advances, as banks may exhibit varying degrees of dominance across different functional activities (Sinha et al., 2019). Failure to account for such multidimensionality may result in incomplete or misleading assessments of market concentration.

### **2.3 Empirical Evidence from the Indian Banking Sector**

The Indian banking sector has attracted considerable empirical attention due to its unique coexistence of public, private, and foreign banks within a regulated yet competitive environment. Early studies document a decline in overall concentration following financial liberalisation, attributing this trend to increased entry by private and foreign banks and to the deregulation of interest rates (Sharma & Bal, 2010). Subsequent research, however, presents a more nuanced picture. Bishnoi and Devi (2017) find that, while aggregate concentration declined, private-sector banks exhibited increasing market power over time. Similarly, Sinha et al. (2019) report rising competitive pressures but note significant heterogeneity across bank groups. More recent studies highlight renewed concerns about concentration arising from merger-led consolidation in the public sector and rapid asset growth among large private banks (Dhawan & Niharika, 2021; Khan & Ahmad, 2022). Studies examining bank stability in India further suggest that ownership structure plays a critical role in shaping performance and risk outcomes. Public sector banks, despite lower concentration, often face efficiency and asset quality challenges, while private banks exhibit stronger profitability but higher concentration tendencies (Gulati & Singh, 2019). These findings underscore the importance of ownership-specific analysis when evaluating market structure.

### **2.4 Research Gap**

Despite the growing body of literature on bank concentration in India, several important gaps remain. First, much of the existing research focuses on aggregate concentration measures, which may obscure significant variations across ownership groups, such as the public and private sectors and foreign banks. Second, many studies rely on a limited time horizon, restricting their ability to capture long-term structural shifts associated with successive reform phases and recent consolidation episodes. Third, concentration is often measured using a single balance-sheet indicator, neglecting the possibility that banks may dominate specific segments such as deposits or advances without necessarily controlling total assets. Moreover, empirical studies rarely apply statistical tests to formally examine whether observed differences in concentration across bank groups are significant. As a result, the extent to which ownership structure influences concentration dynamics in Indian banking remains

insufficiently explored. In light of these gaps, there is a clear need for a systematic and disaggregated examination of bank concentration in the Indian banking sector that captures long-term structural changes and ownership-specific dynamics. Existing studies provide valuable insights but remain limited in their ability to explain how concentration has evolved across different bank groups and balance-sheet dimensions over extended reform periods. By adopting a multi-dimensional approach to measuring concentration using assets, deposits, and advances, and by empirically testing inter-group differences, the present study seeks to bridge this gap in the literature. The analysis not only enhances understanding of market structure in Indian banking but also offers an empirical basis for evaluating the implications of consolidation and competitive dynamics for regulatory policy. Building on this review, the following section outlines the specific objectives and hypotheses that guide the empirical investigation.

### 3. Objectives of the Study and Hypotheses

#### 3.1 Objectives of the Study

The primary objective of this study is to examine the extent and evolution of bank concentration in the Indian banking sector using the Herfindahl–Hirschman Index (HHI). Specifically, the study seeks to:

1. To analyse the trend and magnitude of bank concentration in the Indian banking sector based on total assets, deposits, and advances over the period 1999–2024.
2. To examine differences in concentration levels across public sector banks, private sector banks, and foreign banks.
3. To assess whether observed differences in concentration across bank groups are statistically significant.
4. To evaluate structural changes in market concentration in the context of banking reforms and consolidation in India.

These objectives are designed to provide a comprehensive and ownership-specific understanding of concentration dynamics in Indian banking.

#### 3.2 Research Hypotheses

Based on the objectives and existing literature, the following hypotheses are formulated:

**H<sub>01</sub>:** There is no significant difference in bank concentration, measured by the Herfindahl–Hirschman Index, across public sector banks, private sector banks, and foreign banks in India.

**H<sub>11</sub>:** There is a significant difference in bank concentration, measured by the Herfindahl–Hirschman Index, across public sector banks, private sector banks, and foreign banks in India.

**H<sub>02</sub>:** There is no significant difference in concentration levels across bank groups when measured using total assets, deposits, and advances.

**H<sub>12</sub>:** There is a significant difference in concentration levels across bank groups when measured using total assets, deposits, and advances.

**H<sub>03</sub>:** Bank concentration in the Indian banking sector has not changed significantly over time.

**H<sub>13</sub>:** Bank concentration in the Indian banking sector has changed significantly over time.

## 4. Data and Methodology

### 4.1 Data Sources and Sample Selection

The study is based on secondary data collected from published sources of the Reserve Bank of India (RBI), including the *Statistical Tables Relating to Banks in India* and the *Database on Indian Economy*. The sample comprises 60 scheduled commercial banks operating in India, including public, private, and foreign banks. The selection of banks is guided by data availability and continuity over the study period. The analysis covers the period from 1999 to 2024, which captures major phases of banking sector reforms in India, including post-liberalisation restructuring, entry and expansion of private banks, and recent consolidation initiatives. This extended timeframe allows for a comprehensive assessment of long-term structural changes in bank concentration. The sample selection is constrained by data availability and by the need for continuity over the long study period. Banks that experienced mergers, exits, restructuring, or incomplete reporting were excluded to maintain a balanced panel. While this approach enhances comparability across years, it may introduce survivorship bias by over-representing relatively stable institutions and under-representing weaker or short-lived banks. In the Indian context, consolidation of public sector banks after 2017 and exits of some private and foreign banks may slightly understate true concentration levels. To mitigate this limitation, the study focuses on ownership-wise trends rather than individual bank dominance and employs multiple balance-sheet indicators (assets, deposits, and advances) to enhance robustness. Nevertheless, results should be interpreted with caution, acknowledging that structural changes through mergers and exits may influence observed concentration dynamics.

### 4.2 Measurement of Bank Concentration

Bank concentration is measured using the Herfindahl-Hirschman Index (HHI), a widely used indicator of market structure in banking studies. The HHI is calculated as the sum of the squared market shares of individual banks:

$$HHI = \sum_{i=1}^N S_i^2$$

where  $S_i$  represents the market share of the  $i^{\text{th}}$  bank and  $N$  denotes the total number of banks in the market. Market shares are computed separately for three key balance-sheet indicators: total assets, deposits, and advances. This multi-dimensional approach enables a more nuanced assessment of concentration across different functional segments of banking activity. According to the conventional interpretation, an HHI value below 1,500 indicates low concentration, between 1,500 and 2,500 suggests moderate concentration, and above 2,500 indicates high concentration.

### 4.3 Analytical Framework

The analysis proceeds in three stages. First, HHI values are computed annually for the overall banking sector and for each ownership group – public sector banks, private sector banks, and foreign banks. This facilitates comparison of concentration trends across groups. Second, descriptive statistics are used to summarise concentration levels and examine temporal patterns over the study period. Trend analysis is employed to identify structural shifts associated with policy reforms and consolidation episodes. Third, one-way analysis of variance (ANOVA) is applied to test whether differences in concentration across bank groups are statistically significant. The ANOVA framework evaluates the null hypothesis that mean HHI values are equal across ownership categories. Statistical significance is assessed at conventional confidence levels.

### 4.4 Justification of Methodology

The choice of HHI is motivated by its ability to capture both the number of banks and the distribution of market shares, making it superior to simple concentration ratios in assessing market dominance. Moreover, using multiple balance-sheet indicators enhances robustness by reducing reliance on a single measure of banking activity. The application of ANOVA allows for formal statistical testing of inter-group differences in concentration, addressing a limitation of many existing studies that rely primarily on descriptive analysis. Together, these methods provide a comprehensive framework for evaluating concentration dynamics and structural change in the Indian banking sector.

Based on these criteria, the final sample consists of 60 scheduled commercial banks, including public, private, and foreign banks. The ownership-wise list of sampled banks is provided in **Appendix A**.

## 5. Results and Discussion

To facilitate clearer interpretation of concentration dynamics, descriptive statistics of HHI values based on total assets, deposits, and advances are first examined. These statistics summarise the mean, dispersion, and variation of concentration across ownership groups over the period 1999–2024. In addition, ownership-wise trend figures are used to visually present the evolution of HHI across public, private, and foreign banks. Such graphical representation complements numerical results by highlighting structural breaks and gradual shifts associated with regulatory reforms and consolidation episodes. The inclusion of both tabular and visual evidence strengthens empirical transparency and supports subsequent inferential analysis using ANOVA.

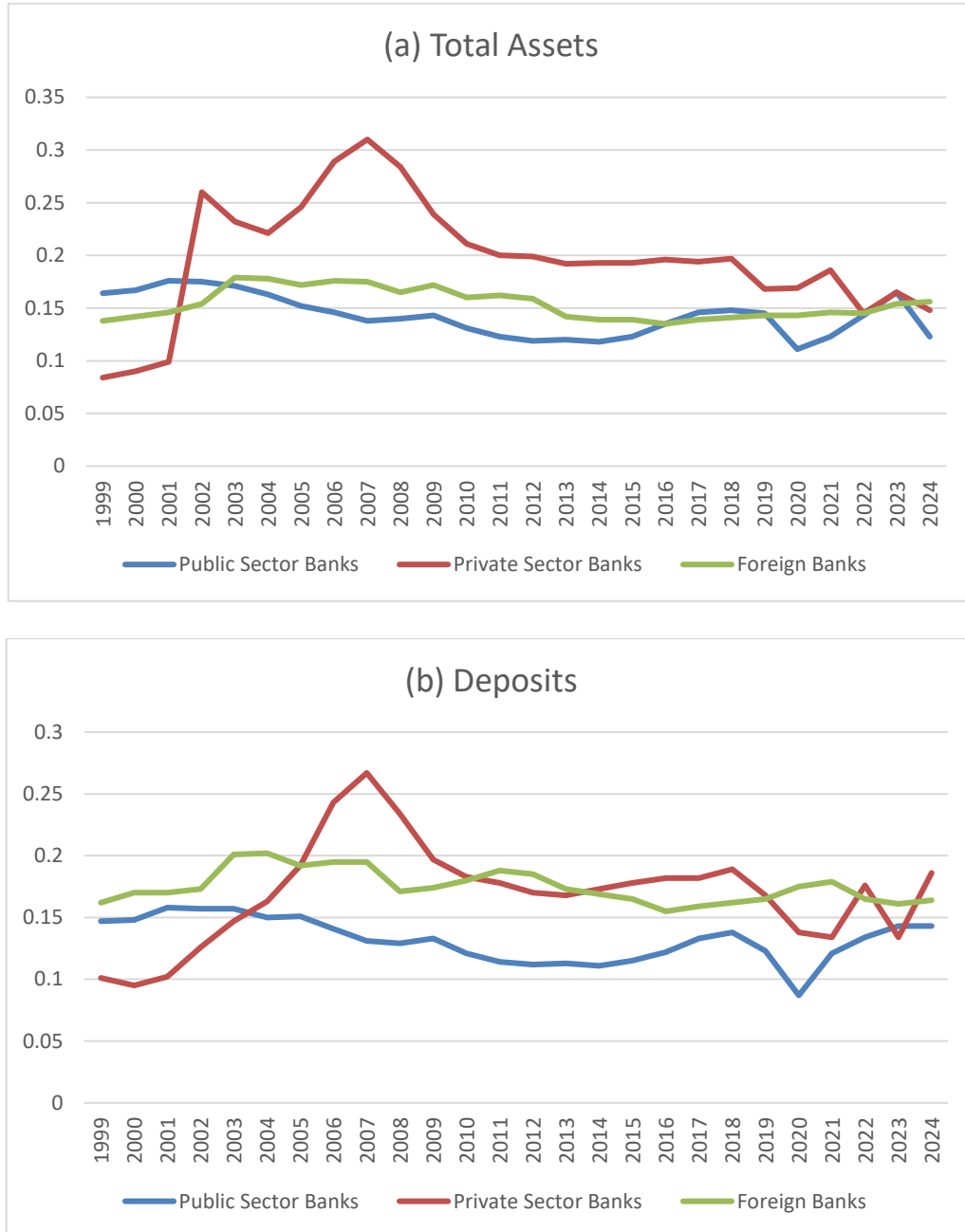
### 5.1 Trends in Bank Concentration in the Indian Banking Sector

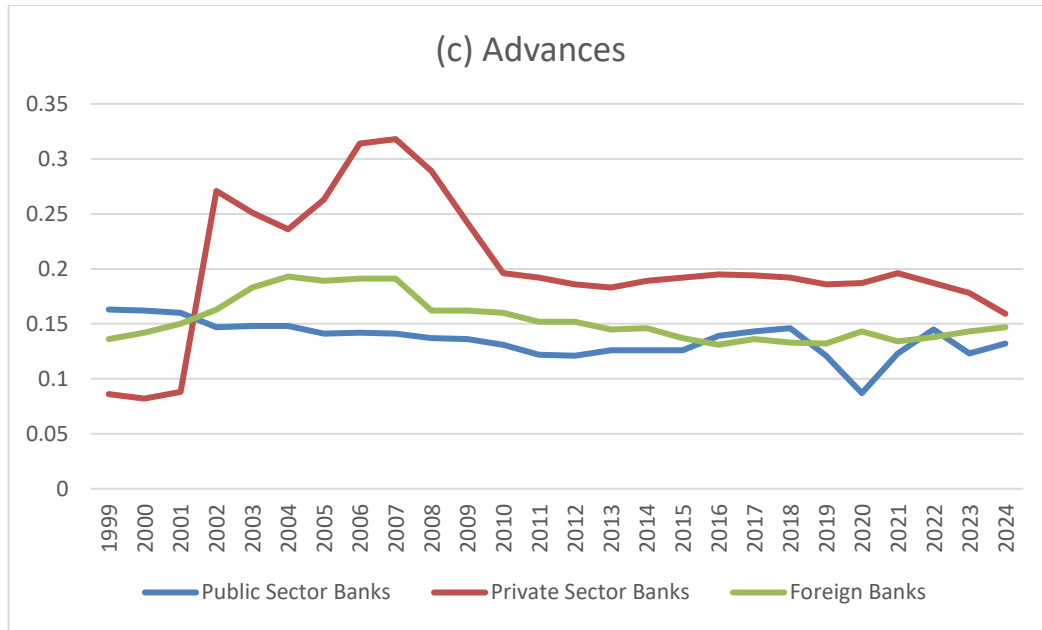
The Herfindahl–Hirschman Index (HHI) estimates indicate a persistently low and gradually declining level of concentration in the Indian banking sector over the study period. Fig 1 presents ownership-wise annual trends in bank concentration based on total assets, deposits, and advances, allowing visual comparison of competitive dynamics across bank groups. Across all three panels, the HHI values remain well below the conventional threshold for high concentration, suggesting an overall intensification of competition within the banking system.

A consistent pattern emerges across the three indicators: public sector banks exhibit relatively lower concentration than private and foreign banks, reflecting a more dispersed market structure. The gradual decline in concentration observed across Panels (a)–(c) also points to a weakening of dominance previously exercised by a few large banks, in line with the objectives of financial sector reforms that

encouraged deregulation and facilitated the expansion of private and foreign banks. Nevertheless, the disaggregation by ownership highlights notable heterogeneity in concentration dynamics that is obscured at the aggregate level.

**Fig 1.** Ownership-wise trends in bank concentration, with Panel (a) depicting HHI based on total assets, Panel (b) illustrating concentration measured using deposits, and Panel (c) showing HHI based on advances.



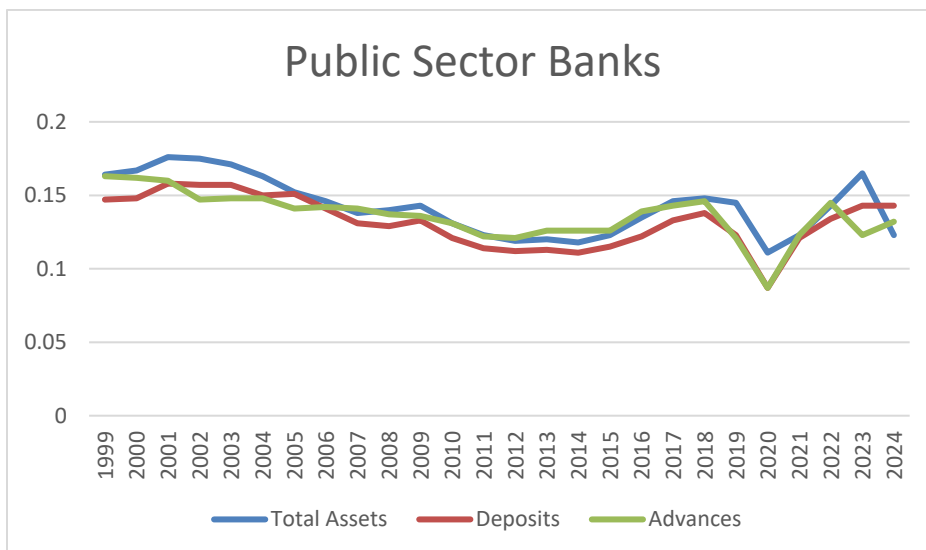


## 5.2 Ownership-wise Analysis of Bank Concentration

### Public Sector Banks

Fig 2. depicts the trend in bank concentration for public sector banks based on total assets, deposits, and advances. The results indicate consistently low levels of concentration across all three indicators throughout the study period. Although public sector banks account for a substantial share of total banking assets and deposits, their market shares are relatively evenly distributed, resulting in lower HHI values. The broadly similar movement of HHI across assets, deposits, and advances suggests that consolidation within the public sector – while improving scale and operational efficiency – has not translated into excessive market concentration. This finding is consistent with earlier evidence that public ownership and regulatory oversight tend to limit market dominance despite large balance-sheet size (Sharma & Bal, 2010).

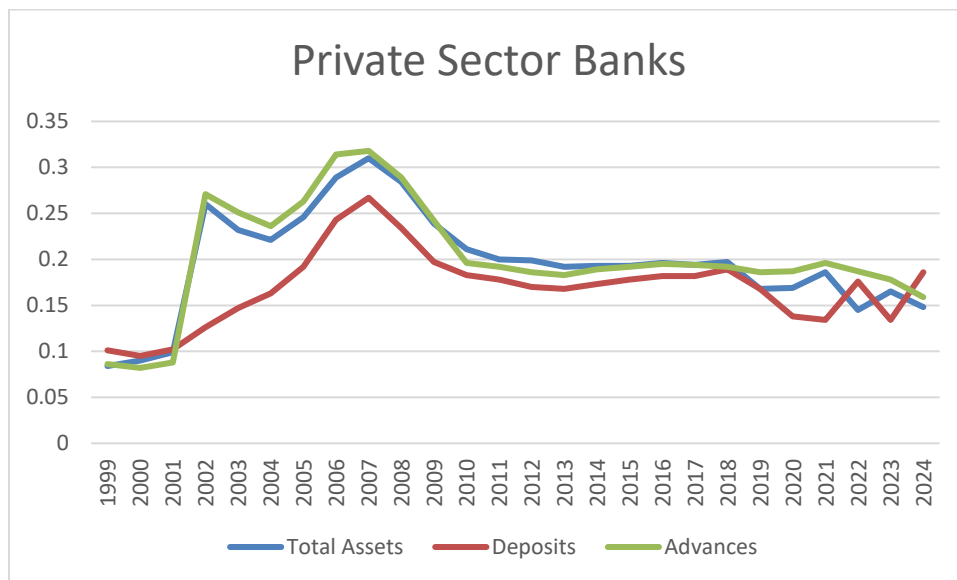
Fig 2. Trend in bank concentration for public sector banks based on total assets, deposits, and advances



### Private Sector Banks

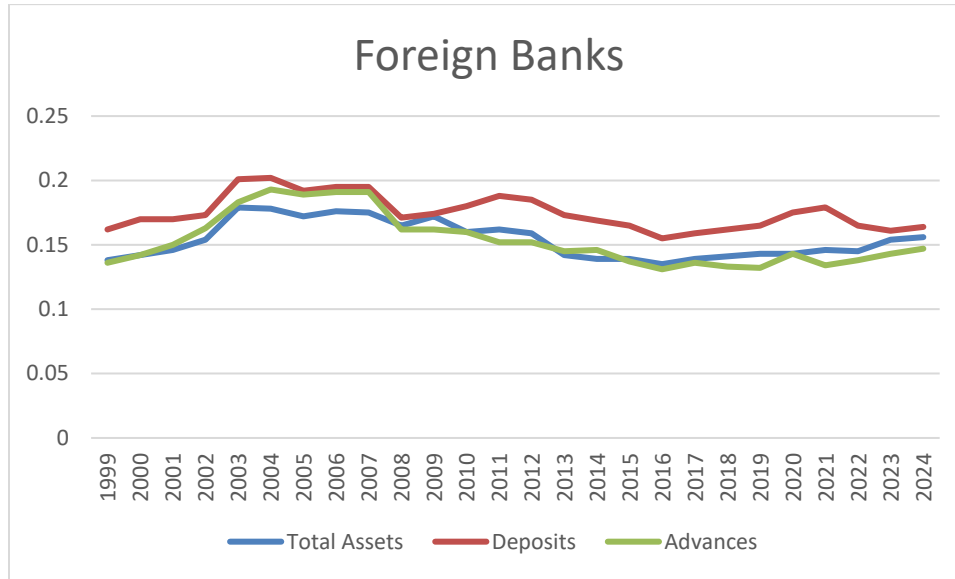
The concentration dynamics of private sector banks, illustrated in Fig 3, show a moderate, gradual increase across all three indicators. In particular, HHI values based on total assets and advances show a more pronounced rise over time, reflecting the rapid expansion of a small number of large private banks. This pattern can be attributed to aggressive growth strategies, technological adoption, and superior operational efficiency relative to other bank groups. While rising concentration may signal efficiency gains, it also raises concerns regarding potential market power and competitive balance in the private banking segment. Similar trends have been documented in post-reform studies of the Indian banking sector (Bishnoi & Devi, 2017; Khan & Ahmad, 2022).

Fig 3. Reveal a moderate and gradually increasing trend across all three indicators



### Foreign Banks

Fig 4. presents the concentration trends for foreign banks based on assets, deposits, and advances. The HHI values indicate moderate but relatively stable concentration levels over the study period. Although foreign banks exhibit higher concentration within their group, their overall impact on the Indian banking market remains limited due to their smaller market share. The close alignment of HHI trends across the three indicators suggests that foreign banks primarily operate in niche segments, with a strategic focus on wholesale and corporate banking. Regulatory constraints and limited branch expansion further explain the absence of significant fluctuations in concentration within this group.

**Fig 4.** The concentration trends for foreign banks based on assets, deposits, and advances

### 5.3 Comparison Across Balance-Sheet Indicators

Concentration patterns vary across balance-sheet indicators, as reflected in differences in average HHI values based on total assets, deposits, and advances, as shown in Table 1. While the overall level of concentration remains low across all indicators, the observed variation suggests that competitive conditions differ across banking functions. This underscores the importance of adopting a multidimensional approach to concentration measurement to capture structural differences across assets, deposits, and credit markets.

**Table 1.** Average HHI Values of Commercial Banks: Bank Group Wise (1999-2024)

Bank Groups	Total Assets	Deposits	Advances
Public Sector Banks	0.145	0.134	0.140
Private Sector Banks	0.206	0.174	0.208
Foreign Banks	0.156	0.177	0.158
Total Commercial Banks	0.093	0.092	0.094

### 5.4 Statistical Evidence on Differences in Concentration

The one-way ANOVA results confirm that differences in bank concentration across ownership groups are statistically significant for all three indicators: total assets (HHI<sub>ta</sub>), deposits (HHI<sub>d</sub>), and advances (HHI<sub>ad</sub>) (Table 2). The null hypothesis of equal mean concentration across public, private, and foreign banks is rejected at the 1% significance level, indicating that ownership structure significantly influences market concentration.

To identify the specific pairs of bank groups that differ, a Dunnett T3 post hoc multiple-comparison test was conducted after confirming a violation of homogeneity of variances using Levene's test. The post hoc results (Table 3) reveal that:

- For **total assets**, public sector banks have significantly lower concentration than private sector banks (mean difference = -0.062,  $p < 0.01$ ), while private sector banks exhibit higher concentration than foreign banks (mean difference = 0.051,  $p < 0.01$ ).
- For **deposits**, public sector banks display significantly lower concentration compared to both private (-0.039,  $p < 0.01$ ) and foreign banks (-0.043,  $p < 0.01$ ).
- For **advances**, public sector banks again show lower concentration relative to private (-0.068,  $p < 0.01$ ) and foreign banks (-0.018,  $p < 0.05$ ), whereas private sector banks have significantly higher concentration than foreign banks (0.050,  $p < 0.05$ ).

These results confirm that public sector banks maintain the lowest concentration levels across all key indicators, while private and foreign banks exhibit relatively higher concentration. The post hoc findings provide a nuanced understanding of inter-group differences that complements the aggregate HHI trends discussed earlier.

**Table 2.** ANOVA F-test and Levene’s test of Homogeneity of Variances across Bank Groups

Dependent Variable	F	p-value	Levene Statistic	p-value
HHI <sub>ta</sub>	14.850	0.000**	8.463	0.001**
HHI <sub>d</sub>	13.710	0.000**	6.447	0.003**
HHI <sub>ad</sub>	14.090	0.000**	15.242	0.000**

**Table 3.** Post Hoc Analysis of Bank Concentration across Bank Groups

Dependent Variable	(I) Bank Groups	(J) Bank Groups	Mean Difference (I-J)	Std. Error	p-value
HHI <sub>ta</sub>	Public Sector Banks	Private Sector Banks	-0.062	0.014	0.001**
		Foreign Banks	-0.011	0.006	0.174
	Private Sector Banks	Public Sector Banks	0.062	0.014	0.001**
		Foreign Banks	0.051	0.014	0.005**
	Foreign Banks	Public Sector Banks	0.011	0.006	0.174
		Private Sector Banks	-0.051	0.014	0.005**
HHI <sub>d</sub>	Public Sector Banks	Private Sector Banks	-0.039	0.011	0.003**
		Foreign Banks	-0.043	0.005	0.000**
	Private Sector Banks	Public Sector Banks	0.039	0.011	0.003**
		Foreign Banks	-0.003	0.011	0.981
	Foreign Banks	Public Sector Banks	0.043	0.005	0.000**
		Private Sector Banks	0.003	0.011	0.981
HHI <sub>ad</sub>	Public Sector Banks	Private Sector Banks	-0.068	0.016	0.001**
		Foreign Banks	-0.018	0.006	0.011*
	Private Sector Banks	Public Sector Banks	0.068	0.016	0.001**
		Foreign Banks	0.050	0.016	0.014*
	Foreign Banks	Public Sector Banks	0.018	0.006	0.011*
		Private Sector Banks	-0.050	0.016	0.014*

## 6. Discussion and Policy Implications

The findings suggest that while India's banking sector remains broadly competitive, **structural shifts in concentration are occurring within ownership groups**, particularly among private sector banks. The rise in private-sector concentration highlights the need for vigilant competition policy and regulatory oversight to prevent excessive market power. At the same time, low concentration among public sector banks indicates that consolidation initiatives have not undermined competitive balance.

The observed increase in concentration among private sector banks can be attributed to several structural and policy-driven factors. First, post-2008 regulatory strengthening and capital adequacy norms favoured well-capitalised private banks, enabling them to expand credit more aggressively than weaker competitors. Second, technological adoption and digital banking platforms allowed large private banks such as HDFC and ICICI to scale rapidly, capture retail markets, and improve cost efficiency relative to smaller banks. Third, consolidation episodes and the exit of stressed institutions reduced the number of competitors, indirectly increasing the market shares of dominant private banks. In addition, reforms promoting financial inclusion and payment system modernisation disproportionately benefited technologically advanced private banks. These developments suggest that rising concentration is not merely mechanical but reflects asymmetric growth strategies and regulatory environments that reward scale, efficiency, and innovation.

The differentiated concentration patterns across bank groups call for ownership-sensitive regulatory strategies rather than uniform policy prescriptions. Regulators should strengthen competition policy by closely monitoring asset and credit concentration among large private banks and subjecting major mergers and acquisitions to market power assessments using HHI thresholds. To prevent excessive dominance, the Reserve Bank of India may encourage contestability through niche bank licensing, fintech collaboration, and easing entry barriers for well-capitalised institutions. Small and mid-sized banks, particularly public and regional private banks, should be supported through targeted capital infusion, technology adoption incentives, and governance reforms to enhance their competitiveness. Furthermore, macroprudential supervision should integrate concentration metrics with stress testing and CAMEL indicators to detect systemic risks arising from the accumulation of market power. Such a balanced approach would allow India to reap efficiency gains from consolidation while preserving competition and financial stability.

These findings carry important policy implications:

1. **Regulatory Oversight:** Authorities should monitor concentration levels to prevent excessive dominance that may reduce competition and increase systemic risk. Policymakers should balance consolidation with measures that foster market entry and innovation.
2. **Profitability and Solvency Management:** Banks must strengthen capital adequacy and improve asset quality to maintain solvency, especially in sectors with high concentration. Focused strategies on cost management and efficiency enhancement can help mitigate the adverse effects of concentration.
3. **Digitalisation and Efficiency:** Leveraging technology can reduce operational costs and improve service delivery. Digital banking initiatives may also enhance liquidity management, particularly for mid-sized banks facing competitive pressures.
4. **Targeted Support for Smaller Banks:** Public sector and small private banks may require policy incentives or capacity-building measures to improve market share, competitiveness, and stability.
5. **Macroprudential Surveillance:** Given the correlation between concentration and systemic risk, regulators should adopt comprehensive monitoring frameworks, integrating HHI metrics with CAMEL-based stability indices, to ensure long-term resilience in the banking sector.

While concentration can offer economies of scale and risk diversification, excessive concentration

undermines competition and banking stability. Policymakers and bank managers must adopt a dual approach—promoting efficiency and innovation while safeguarding solvency and financial stability—to ensure a resilient Indian banking sector capable of supporting sustainable economic growth.

## 7. Scope for Future Research

While the present study provides a comprehensive assessment of bank concentration in India, several avenues for future research remain. First, future studies may examine the role of digitalisation and fintech adoption in reshaping concentration dynamics, particularly in retail and payment markets. Second, incorporating new entrants such as small finance banks and payments banks could provide richer insights into evolving competitive structures. Third, extending the framework to comparative analysis across emerging economies would help contextualise India's experience within global banking reforms. Finally, future work may integrate concentration measures with bank performance, risk, and inclusion indicators using dynamic panel models to better identify causal relationships between market structure and financial stability.

## 8. Conclusion

The study highlights notable variations in concentration levels across public, private, and foreign banks in India. Public sector banks exhibit the lowest concentration, whereas private banks demonstrate moderate levels with a rising trend, signalling consolidation within this segment. Over time, the Indian banking sector has grown increasingly competitive, reflected in declining concentration levels, especially among commercial banks. Despite maintaining dominant market shares, public sector banks are experiencing negative growth, underscoring the need for restructuring and efficiency improvements. While moderately concentrated, foreign banks have not substantially expanded their market presence. Overall, the declining HHI values indicate a more competitive banking landscape, shaped by regulatory reforms, digitalisation, and market liberalisation.

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