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Article

Ownership concentration and bank performance: Evidence from India

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FINANCIAL ECONOMICS | RESEARCH ARTICLE

Ownership concentration and bank performance: Evidence from India

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Abstract: The purpose of this study is to examine the impact of ownership concentration on the performance of Indian commercial banks. A panel data approach has been used in this study. Particularly, the effect estimation and GMM has been used in this study to examine the relationship between ownership concentration and bank performance during 2009–2010 to 2018–2019. The findings reveal that the largest shareholder impacts the bank's performance positively. The results are robust across the various proxies of bank performance, and sub-samples based on ownership and size of the bank. The present study may be useful for Indian banking regulators and investors to understand the impact of ownership concentration on bank performance.

Subjects: Corporate Finance; Banking; Corporate Governance

Keywords: bank; ownership; performance; public sector banks; private sector banks



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PUBLIC INTEREST STATEMENT

This paper investigates the impact of ownership concentration on the profitability of Indian commercial banks. In India, the banking sector consists of public and private sector banks. This paper uses the hand collected data of ownership concentration from annual report of the banks operating in Indian banking sector. The financial data has been collected from the Reserve Bank of India (RBI), CMIE PROWESSIQ database and Bloomberg database. Fixed effect and GMM estimation methods have been used to analyse the impact of various ownership concentration variables on the profitability of Indian commercial banks. The central government is the largest shareholder in the public sector banks whereas the shareholding is dispersed in the private sector banks. The findings reveal that the largest shareholder impact the bank performance positively. The results are robust across the various proxies of bank performance, and sub-samples based on ownership and size of the bank. The findings may assist the investors in formulating their investment strategies. The study concludes that the ownership concentration impacts the Indian banks performance.

1. Introduction

The global financial system's collapse has heightened the discussion over the vulnerability of a banking system that had previously been seen as powerful, active, and inventive. These developments have brought the issue of the banking system's soundness to the attention of researchers, academics, and legislators. Banks do, in fact, play a crucial role in financial systems and serve as economic development engines (Levine, 1997). Based on the Basel Committee on Banking Supervision's 2010 publication "Standards for Enhancing Corporate Governance," the Basel Committee on Banking Supervision has amended corporate governance principles within banks. The committee has reiterated that good corporate governance is vital to a bank's, banking sector's, and economy's healthy functioning. In this vein, we have seen a number of studies that place a specific emphasis on the link between bank ownership structure and performance (Bonin et al., 2005). Owners' relative authority, motivations, and abilities to oversee managers are determined by disparities in identity, concentration, and resources (Douma et al., 2006). In recent years, academicians have begun to focus on emerging country banking sectors (Weill, 2007). The influence of ownership concentration on company performance is both theoretically and practically intricate. Concentrated ownership, in theory, improves performance through improving supervision and reducing free-rider problems in buyouts (Morck et al., 1986). None of these impacts may be substantial if ownership structure tends to be optimally adapted to firm characteristics with little relationship to performance (Demsetz, 1983). Experiential findings on the relationship between company performance and ownership concentration are conflicting. In the United States, Demsetz and Lehn (1985) find that concentration has no effect on accounting profits, and McConnell and Servaes (1990) find no effect on the market value to replacement cost of assets ratio (Tobin's Q), though they do find that ownership by corporate insiders and institutional shareholders have an affirmative effect. Wruck (1989) suggests that private transactions of lump sum shares are related to increased concentration, and have a though non-monotonic, effect on abnormal market yields, supporting the findings of Morck et al. (1988) of executive ownership, that earnings are growing when concentration is low, declining at moderate levels, and increasing again at high levels. Holderness (2003) notes that it has not been decisively established whether block holders have a positive or negative impact on firm value and that there is little evidence of a significant impact of block holders on company value.

This paper contends that past empirical studies paid little attention to the implications drawn from other techniques of evaluating ownership concentration. Most previous research used, Demsetz and Lehn (1985) to calculate concentration for a group of owners, which is defined as the total equity share held by the top five or top 20 investors. When a dominating shareholder is missing, lesser investors may join coalitions to employ unified control, as proposed by Zwiebel (1995). Furthermore, the group measure may mask certain important aspects of interface block holders. For example, they may have difficulty in cooperating or fighting because of competing interests or views about business direction. Another option is that, in the absence of major investors, new smaller block holders' marginal contributions to executive oversight are minimal, and the latter may help to increase the costs of concentration by reducing trading liquidity and the informative value of the share price. In addition, if the extra block holders do not provide net paybacks, including their stockholding in the concentration variable increases measurement miscalculation, lowering the predicted performance outcome and increasing the standard error. Estimates of the effect of concentration on performance may be influenced by how block holders interact and the concentration measure used in the study. For example, if a single dominant investor controls the firm, measuring only its holdings rather than the joint holdings of the top five or more owners appears to be more appropriate. The group measure, on the other hand, may be more useful if several average-sized investors are capable of creating genuine partnerships. The lack of attention to the likelihood of collaboration among block holders and the assumptions for the appropriate assessment of concentration may explain some of the previous experiential research' inconsistent outcomes.

In terms of the research gap and importance of this topic, the current study provides data on the impact of ownership concentration on the performance of Indian commercial banks. The majority of the literature on ownership concentration is from developed countries (Demsetz & Lehn, 1985; Demsetz & Villalonga, 2001; Leech & Leahy, 1991; McConnell & Servaes, 1995; Pervan et al., 2012; Prowse, 1992). In emerging nations, just a little research on the impact of ownership concentration has been done. However, there is still a gap in the evidence concerning Indian banks. Due to the varied regulatory requirements applicable to Indian commercial banks, we suggest that the impact of ownership concentration on bank performance would be different. The legal framework has been meticulously crafted to serve as a critical company governance tool. As a result, our decision to study Indian banks is influenced by a variety of variables. Firstly, in light of recent regulatory reforms, we focused our research on public and private sector banks, which have got less attention in previous studies. Second, the ownership structure of different banks is diverse. A major share of public sector banks is owned by the central government. The central government backs public sector banks. The central government owns more than half of all public-sector banks. In private sector banks, the maximum promoter stake allowed is 15 percent. Third, foreign direct investment in public sector banks is limited to a maximum of 20 percent. In private sector banks, however, the maximum permitted FDI is 74 percent. The Reserve Bank of India's regulations states that no single entity or individual can own more than 10 percent of a private sector bank. Fourth, private banks have a higher foreign shareholding than public sector banks. Four out of the top five private sector banks in India are foreign-owned. Fifth, the extent to which the investor protection system is enforced differs by country (La Porta et al., 1999, 1998). Hence, Indian banks have a unique legal structure since they are heavily regulated. This allows us to see if the differences in bank ownership structures among different ownerships have an influence on the banks' performance. In particular, our study differs from earlier ones in that it aims to investigate the influence of bank ownership structure on bank performance in India using an econometric technique that addresses endogeneity issues. This study makes two contributions: first, it fills a vacuum in the banking literature by concentrating on the banking industry in India. Second, it attempts to acquire a better understanding of a key predictor of bank performance, and ownership structure.

Because of the differences in market structure and ownership structure, Indian banks are considered out of sample evidence, prompting us to investigate the effect of ownership concentration on the performance of Indian banks. We examine these concerns using data from 36 banks in the Indian banking industry. To estimate fixed-effect panel regressions of ROA, NIM, and NPLR on various indices of ownership concentration, we use the available panel data for banks operating in the Indian banking industry from 2009–2010 to 2018–2019. This research adds to the current body of knowledge. We have evaluated the data by categorizing the banks based on ownership, i.e. public sector banks vs. private sector banks, to ensure that the findings were reliable. In several methodological areas, our work resembles the latter's, but there are a few key distinctions. It's worth noting that the endogeneity problem, which is one of the most common econometric issues in the corporate governance literature, might skew empirical results. "In the presence of any pattern of heteroscedasticity and autocorrelation, these results computed using the GMM approach are consistent" (Arellano & Bover, 1995; Blundell & Bond, 1998). The use of GMM solves the problem of heterogeneity by taking the initial differences and so eliminating the individual impact, resulting in unbiased findings. The endogeneity problem is likewise addressed by the GMM estimation. The estimate method, in particular, incorporates lagged explanatory variables as instruments, allowing for extra instruments by using the orthogonality criteria between the lags in the model's independent variables (Arellano & Bond, 1991). We find that different levels of ownership concentration have a substantial impact on bank performance whereas state control is associated with poor performance. We get comparable findings after performing a robustness test using the Generalized method of moments (GMM) methodology to estimate the purpos model.

The following is the organization of the structure. The second section discusses India's institutional basis. The third section examines the current literature and develops hypotheses. The data

and technique are described in Section 4. The analytical and empirical findings are presented in Section 5. The paper is discussed and concluded in Section 6.

2. Institutional background of India

Certain trigger points are defined in the Securities Appellate Tribunal (Procedure) Rules, 2000. The first percentage point is 5percent. After the investor achieves a holding level of 5percent of the company's total ownership, the investor is required to provide disclosure for each change of 2percent in holdings. As a result, the maximum limit for purchasing a share of the company on the secondary market is 5percent. However, in the IPO's, maximum subscription limit is \$25,000 per investor. A one-person company (OPC) is defined as a business with only one member who owns all of the firm's shares [(Section 2(62)] of the Indian Companies Act, 2013). Section 2 (68) of the Indian Companies Act, 2013 states that a Private Limited Company must have at least two members. A single person or corporation may possess 99 percent of the stock, while others may own the remaining 1 percent. The promoters' shareholding should be at least 20 percent of the paid-up capital at the time of the company's creation, with a three-year lock-in term. After a three-year term, the promoter may sell their interest. Companies can issue shares with differentiated voting rights up to a maximum of 26 percent of the paid-up equity share capital under the new Companies Act 2013, which can be used for dividend payments, voting, and other purposes. The promoter/promoter group is authorized a maximum stake of 15 percent. A maximum of 74 percent of the equity capital of private banks can be held by foreign institutional investors. In public sector banks, the government may own a majority of all of the bank's stock. The government of India maintained a 100 percent share in the banks when they were nationalized in 1969. However, owing to changes in the environment, nationalized banks offered shares to raise capital through an initial public offering (IPO), resulting in a shift in the ownership structure. Even yet, the Indian government retains a minimum of 51 percent of the stock by default. A banking firm is prohibited from owning more than 30 percent of a corporation's paid-up share capital. The acquisition of more than 5 percent of a bank's equity capital by an individual, organization, or group will require RBI permission in advance. A single entity or group of linked entities cannot own more than 10 percent of the bank's paid-up voting equity capital, either directly or indirectly. The Banking Regulation Act (1949), does not specify the maximum number of shares that a shareholder can own in a banking firm. However, regardless of the number of shares held, such stockholders cannot exercise more than 10 percent voting rights. The Securities and Exchange Board of India (Listing Obligations and Disclosure Requirements) Regulations, 2015, in conjunction with Regulation 19A of the Securities Contract (Regulation) Rules, 1957 ("SCRR") (Regulation 38), require listed businesses to have a minimum public shareholding of 25 percent. The SEBI takeover laws enable the promoter to own up to 75 percent of the company, with yearly creeping acquisitions of up to 5 percent allowed. A bank cannot have more than three directors who are also directors of firms with a combined voting power of more than 20 percent of the total voting power."

3. Literature review

3.1. Agency theory

This research's theoretical foundation is agency theory, which stems from Berle and Means (1932) study, which found that dispersed ownership leads to a shift of corporate power from individual shareholders (owners) to executives in listed corporations. Jensen and Meckling (1976) argued that such a separation between control and ownership would lead to agency conflict and provide agents (managers) additional incentives to do things that benefit them at the expense of the principals (shareholders). Both studies show that aligning the incentives of the executive and investors has a positive impact on business performance since agency clash disappears when the executives and stockholders are the same people. This impact was demonstrated by Morck et al. (1986), who discovered a clear link between ownership concentration and business value. New conflicts of interest between majority and minority shareholders have been investigated in other research (La Porta et al., 1999, 1998). La Porta et al. (1998) looked at ownership

concentration and found that Berle and Means (1932) reasoning does not apply to the majority of nations. Furthermore, Shleifer and Vishny (1997) claimed that the true rivalry is between large and small owners. They asserted that in less developed nations, where property rights are not legally protected, ownership concentration is higher. Stockholders may play a substantial role, according to Grossman and Hart (1980), since they have the rights and dangers associated with controlling their ownership. Nonetheless, when ownership is spread, they are at a disadvantage owing to a lack of shareholder oversight caused by the “free-rider” problem. Regardless of competing interests, it is critical to investigate the kind of ownership structure in order to determine the form of agency conflict and identify which parties are in charge of the conflicts of interest in order to resolve the agency problem. Ownership concentration, according to agency theory, boosts business performance, and large shareholders can provide organizations with the ability to oversee and control management. In the meanwhile, because of the various disputes that arise between minority shareholders and major shareholders in nations with relatively high concentrations of ownership and insufficient shareholder protection, this position is crucial to examine (Shleifer & Vishny, 1997). As a result, the agency conflict between managers and shareholders is not a huge issue in this context, because the true dispute is the expropriation of minority shareholders (La Porta et al., 1999, 1998).

3.2. Previous studies

According to existing research, the corporate governance process varies depending on the ownership structure. The ownership of a company might be dispersed or consolidated. Small shareholders own the firms that have a dispersed ownership structure, yet the management has control. Large shareholders control companies with concentrated ownership (Balsmeier & Czarnecki, 2017; Carney et al., 2015; Claessens & Fan, 2002; Morck et al., 1986). These firms’ controlling owners are expected to impose terms and conditions on the executives and force them to operate in accordance with their wishes. They profit from economies of scale and attempt to mitigate free-rider issues (Mollah et al., 2012). According to agency theory, ownership concentration is an important component of corporate governance that helps to reduce agency conflict (Balsmeier & Czarnecki, 2017; Jensen & Meckling, 1976; Morck et al., 1986; Nguyen et al., 2015). The main reason in favour of ownership concentration and firm performance is the trade-off between supervising and misappropriation effects (Filatotchev et al., 2013) because monitoring is difficult in the event of dispersed ownership, which might lead to free-riding issues. As a result, the monitoring hypothesis predicts a direct link between ownership concentration and company performance. As the percentage of shares held by these wealthy shareholders grows, so does the price of the stock (Filatotchev et al., 2013; Gillan, 2006; Shleifer & Vishny, 1987). Because controlling shareholders are genuine active monitors who may constrain management influence, a favourable link (Altaf & Shah, 2018; Boussaada & Karmani, 2015; Nashier & Gupta, 2020) is predicted based on the monitoring hypothesis. This may help to reduce agency conflict, resulting in better performance (Jensen & Meckling, 1976). The importance of concentrated ownership in monitoring becomes critical in underdeveloped governance markets because, in the absence of external monitoring or institutional mechanisms, shareholders are forced to participate in the monitoring process, which may be effective only when ownership is concentrated (Filatotchev et al., 2013; Gomes, 2000; Heugens et al., 2009). The expropriation theory, on the other hand, creates a worse state of ownership concentration. The conflict of interest between the majority and minority shareholders might be the source of the agency conflict (La Porta et al., 1999; Lefort, 2005; Murtinu, 2015; Sacristan-Navarro & Gomez-Anson, 2007; Yabei & Izumida, 2008). In this case, the large ownership may have a significant impact on business performance, which may differ from firm to firm. As a result, it’s possible that the agency problem in high-ownership-concentration organizations would move from principal-agent conflicts to principal-principal conflicts (Bebchuk & Weisbach, 2010). Furthermore, both hypotheses could point to a non-linear relationship between ownership concentration and performance, i.e., a firm’s performance may increase initially at low levels of ownership concentration due to the monitoring effect but then decline after a certain point when ownership concentration is high due to the expropriation effect. The federal government owns the majority of public sector banks in India. The results, however,

are mixed. A positive linear association has been identified in several researches (Karaca & Halil, 2012; Murtinu, 2015; Nguyen et al., 2015). Because dispersed ownership generates a free-riding problem, ownership concentration is a measure of shareholders' capacity to force managers' conduct and is predicted to have a positive connection with business value (Denis & McConnell, 2003; Grossman & Hart, 1980; Jensen & Meckling, 1976). In England, Cubbin and Leech (1983) find a positive relationship between ownership concentration and accounting profit. Shleifer and Vishny (1986) have found that as the ownership of large shareholders grows, share prices rise. However, Leech and Leahy (1991) and Guerrero-Villegas et al. (2018) find that ownership concentration has a negative influence on valuation ratio, trading profit margin, and net asset growth in UK enterprises. By affecting the allocation of voting rights and managing the shareholders, ownership concentration largely reduces the executives' diversion from shareholder welfare (Leech & Leahy, 1991). Another viewpoint contends that increased ownership concentration increases the possibility of embedded block shareholders causing a drop in corporate value. In Tunisia, Turki and Ben Sedrine (2012) discovered a negative correlation between company performance and ownership concentration. Ongore (2011) in Kenya, Pervan et al. (2012) in Croatia, and Foroughi and Fooladi (2012) in Iran all found similar outcomes. De Miguel et al. (2004) also discovered a quadratic link between value and ownership concentration, confirming not only the monitoring but also the expropriation impact in Spanish enterprises at the highest concentration values. An inverted U-shaped association has also been documented in other investigations (Balsmeier & Czarnitzki, 2017; Heugens et al., 2009; Ma et al., 2010; Selarka, 2005). Furthermore, several researchers have shown a non-significant link between company performance and ownership concentration (McConnell & Servaes, 1995; Pham et al., 2011). Ownership structure should impact monitoring efficiency and lessen agency difficulties, according to the current study, which is compatible with agency theory and the institutional framework in India. Because Indian banks have a highly concentrated ownership structure. We assume a positive linear relationship between ownership concentration and bank performance, despite the contradictory arguments of agency theory and empirical data. Hence, we form the following hypothesis:

H1: There is a positive relationship between ownership concentration and bank performance

3.2.1. State ownership

According to Atkinson and Stiglitz's (1980) social welfare theory, public banks may pursue social and economic development goals that make them less lucrative and hazardous than private banks. Public banks are seen as a way to increase social welfare. When the frequency of market failures is high in some industries, state-controlled banks must adopt a more active strategy; they may concentrate on those involving external finance, knowledge asymmetries, intangible assets, and significant spillovers (Yeyati & Micco, 2007). Because they prioritise larger societal aims, state-owned banks are less lucrative. According to political theory (Shleifer & Vishny, 1994), state-controlled banks are inefficient and politically exploited (Omran, 2007). Increasing the state's ownership enhances political lobbying. State-owned banks, are more susceptible to political influence than private banks. They are subjected to less surveillance (Megginson, 2005). Politicians construct and retain state-owned banks, according to this viewpoint, not to divert cash to economically effective purposes, but rather to maximize politicians' personal goals (Sapienza, 2004). Berger et al. (2008) show that state-owned banks had inferior long-term performance than domestically-owned banks or foreign-owned banks, based on a sample of 18 Argentine institutions from 1993 to 1999. According to Micco et al. (2007), state-owned banks in underdeveloped nations have considerably lower returns on assets than equivalent domestic privately-owned banks. According to Mohieldin and Nasr (2007), public sector banks in Egypt have several flaws, including a low capital adequacy ratio, poor asset quality, a high ratio of nonperforming loans, modest earnings and profitability, declining liquidity, and a moderate level of exposure to various forms of financial market risk. The relationship between ownership structure and bank performance is investigated by Kobeissi and Sun (2010) and revealed that private banks outperform state banks.

Additionally, Farazi et al. (2013) analysed developments in MENA banking system architecture, during 2001–2008, and discovered that state banks performed worse than private banks. As a result, we propose the following hypothesis:

H2: There is a negative relationship between state ownership and bank performance.

4. Sample and data

4.1. Sample

We are going for all of India's commercial banks. We chose commercial banks since they had continuous data throughout the sample period. Foreign banks were excluded since they are not registered under the Indian Companies Act, 2013, and are not listed on Indian stock markets. They are acting as a branch office for their parent company. They do not comply with the article 49 listing agreement, and their information is unavailable. Finally, we selected 36 banks of which 21 are public sector banks and 15 are private sector banks (Gupta & Mahakud, 2020a, 2020b). The research was conducted during 2009–10 to 2018–19. The information on ownership concentration is gathered by hand from annual reports. The financial data was compiled using the CMIE Prowess IQ database and the Bloomberg database. We separated the entire sample into public and private banks based on ownership. Banks with total assets in the upper tercile are referred to as large banks, while those with asset values in the lower tercile are referred to as small banks.

4.2. Models specification and estimation method

A panel data model is defined as follows, assuming a linear connection between ownership concentration and bank performance:

$$BANKP_{it} = \alpha_i + \theta_1 OC1_{it} + \theta_2 OC2_{it} + \theta_3 OC3_{it} + \theta_4 OC4_{it} + \theta_5 OC5_{it} + \theta_6 OC6_{it} + \theta_7 OC7_{it} + \theta_8 OC8_{it} + \theta_9 LDR_{it} + \theta_{10} RD_{it} + \theta_{11} FAGE_{it} + \epsilon_{it} \quad (1)$$

Where, $BANKP_{it}$ = Bank performance indicator are measured by ROA, NIM, and NPLR. ϵ_{it} is the disturbance term, i is the bank from 1 to 36, and t is the values of years from 2010 to 2019. The β parameters capture the possible effect of explanatory variables on bank performance indicators. ROA (Return of Assets), measures how efficiently the banks' assets are being utilized for generating earnings (Gupta et al., 2021c; Gupta & Mahakud, 2021a; Gupta et al., 2021b). NIM (Net Interest margin) is the net interest income minus net interest expenses divided by total assets. NPLR is the Non-performing loan ratio (Liang et al., 2013). Table 1 describes the variables used in our study.

The concentration ratio, Herfindahl Index, and entropy may all be used to calculate ownership concentration. The influence of various techniques of ownership concentration is examined using a varied concentration ratio. According to Earle et al. (2005), if the largest shareholder has a dominant position, it is more difficult for the other significant owners to interact, and hence they may be unable to discipline management. As a result, including additional block holders when calculating ownership concentration may reduce the impact of ownership concentration on performance. According to Maury and Pajuste (2005), the relationship between numerous block holders and firm performance is influenced by the size of the shareholders.

The fraction of shares held by the largest shareholder has been employed in most research to determine ownership concentration. Earle et al. (2005) and Rogers et al. (2008), on the other hand, employed both the largest shareholder concentration and the proportion of shares held by other major block holders, such as the top 2, top 3, or top 5, etc. Earle et al. (2005) discover a significant association between ownership and performance. However, Rogers et al. (2008) discover a weak relationship. We also used the eight ownership concentration variables - percentage of single

Table 1. Description of variables

Governance variables	
One largest shareholder ((OC1)	Percentage of largest block holder to the total equity
Two largest shareholders (OC2)	Percentage of the two largest block holders to the total equity
Three largest shareholders (OC3)	Percentage of the three largest block holders to the total equity
Four largest shareholders (OC4)	Percentage of the four largest block holders to the total equity
Five largest shareholders (OC5)	Percentage of the five largest block holders to the total equity
Six largest shareholders (OC6)	Percentage of the six largest block holders to the total equity
Seven largest shareholders(OC7)	Percentage of the seven largest block holders to the total equity
Eight largest shareholders (OC8)	Percentage of the eight largest block holders to the total equity.
Performance variables	
Return on Assets (ROA)	Net Profit divided by Total Assets.
Net Interest Margin (NIM)	(Interest Income—Interest Expenses)/Total Assets
NPLR	Problem Loan divided by Total Loans.
Control variables	
Revenue Diversification (RD)	Total Non-Interest Income/Total Income
FAGE	Log(Current year—year of establishment)
LDR	Total Loans/Total Deposit

largest shareholders (OC1), percentage of top two largest shareholders (OC2), percentage of top three largest shareholders (OC3), percentage of top four largest shareholders (OC4), percentage of top five largest shareholders (OC5), percentage of top six largest shareholders (OC6), percentage of top seven largest shareholders (OC7), and percentage of largest eight shareholders (OC8), as suggested by Earle et al. (2005) and Rogers et al. (2008). (See Table I for a list of variables and their definitions.)

Three control variables were considered: bank age, revenue diversification (RD), and loan to deposit ratio (LDR). The “learning by doing” idea claims that there is a positive association between bank age and profitability, and that as banks get older, their productive efficiency improves because they can learn from their prior experiences (Balk & Gort, 1993). According to Jiang et al. (2003), historic banks may be more lucrative due to longer customer relationships, a solid reputation, and a larger client base. It is expected that banks that operate in a variety of enterprises would earn more money (Stiroh & Rumble, 2006). Economies of scale can help banks with more diverse activities cut expenses (Tan, 2018, 2017; Y. Tan & Floros, 2012; A. Y. Tan & Anchor, 2017). However, Demircuc—Kunt and Huizinga (1999), Gischer and Jüttner (2001), and Tan (2016) have shown that revenue diversification has a detrimental impact on bank profitability since conventional interest-earning activities may encounter less competition than fee-earning activities. The evidence for a link between income diversification and bank profitability is contradictory. In the case of Italian banks, Chiorazzo et al. (2008) find that revenue diversification raises the risk/return trade-off, with a greater impact on large banks. Similarly, Demircuc—Kunt and Huizinga (2010) explained that income diversification improves banks’ performance, but that the gains are outweighed by the increased exposure to non-interest activities. According to DeYoung and Torna (2013), a sound bank’s collapse risk

is lower than that of economically challenged banks with a greater percentage of non-traditional operations. According to certain research, income diversification has a negative link with bank profitability (DeYoung & Roland, 2001; Stiroh, 2004). Lepetit et al. (2008) also found that banks that place a greater emphasis on non-interest operations (commission and fee) have a higher default risk than banks that are primarily focused on lending, which is especially true for small banks.

Fiordelisi et al. (2011) find that income diversification increases bank risk by analyzing European data. In addition, Khanh Ngoc Nguyen (2019), when analyzing Vietnamese commercial banks, finds that diversity has a negative impact on profitability since more diversification means more risk. In addition, we have included LDR as a control variable. Table 1 summarises the measurements of all of these factors.

“The panel data models with standard errors grouped at the industry level are used in this study.” Because the unobservable heterogeneity and endogeneity of ownership variables cannot be represented by pooled regression estimates, we employed panel data approaches to estimate the models. The most widely utilized panel data models are fixed effect and random effect models (Adams & Mehran, 2008). To discover an appropriate panel data approach for estimating the bank performance equation, statistical tests such as the LM test and the Hausman test were used. In the end, all of these experiments favoured the fixed-effect model over the random-effect one. Unobserved heterogeneity, which represents individual-specific effects not represented by observable variables, may be controlled using the fixed-effect model. Although the intercept may change between persons (banks), each individual’s intercept is time-invariant, thus the phrase “fixed effects.” The F-statistics define the accuracy of the models. Additionally, we divide the sample depending on several parameters such as ownership and bank size to conduct robustness tests to assess the models’ capabilities.”

5. Data analysis

5.1. Descriptive statistics

The descriptive statistics for the sample are shown in Table 2. It indicates that private-sector banks are more lucrative than their public-sector counterparts. According to the statistics, the largest shareholder owns 54.75 percent of the bank’s total stock. In public sector banks, the largest shareholder owns 68.56 percent, whereas in private sector banks, the largest shareholder owns 34.43 percent. This might be because the federal government is the main stakeholder in public sector banks. The central government owns as much as 80% of the shares in some public sector banks. In the private sector, however, the promoters are the majority shareholders. As per the RBI guidelines, the promoters of the private sector banks have to reduce their shareholding to 15% after a fixed time from the date of incorporation. The public sector banks are older in age. The loan to deposit ratio of private sector banks is higher than public sector banks. The private sector banks are better able to find the avenues for disbursement of loans for the deposits they are getting from the public or other resources. The income of private sector banks (13%) is more diversified as compared to the public sector banks (10%).

5.2. Correlation analysis

The correlation matrix of the variables utilized in the study is shown in Table 3. The correlation matrix demonstrates the problem of multicollinearity since the correlation coefficient values are quite high. As a result, we have employed ownership concentration factors in a variety of models. The concentration of ownership has a favourable relationship with performance. The performance of the banks has deteriorated over time, while their NPLR has increased. Revenue diversification has a favourable relationship with ROA but a negative relationship with NIM. LDR is favourably with associated bank performance, according to the correlation matrix.

Table 2. Descriptive statistics

Variables	All Banks		Public banks		Private banks	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
ROA	0.8742	0.5098	0.6502	0.3926	1.1879	0.4903
NIM	2.9457	0.7353	2.5978	0.5174	3.4580	0.6888
NPLR	2.6253	2.1085	3.6385	3.0173	1.2068	1.1975
OC1	54.7588	19.4105	68.5603	10.3139	35.4368	10.6840
OC2	71.0268	17.1352	81.7750	7.7189	55.9793	15.2674
OC3	80.8169	16.0804	89.9661	5.1476	68.0080	17.4000
OC4	86.4799	15.7646	94.4136	3.9001	75.3728	19.0957
OC5	89.9188	15.7409	97.1523	2.8786	79.7919	20.2115
OC6	91.6080	15.8479	98.3594	2.8549	82.1561	20.9684
OC7	92.1484	15.8436	98.6218	2.8619	83.0857	21.2539
OC8	92.2719	15.8403	98.7011	2.8670	83.2710	21.2923
LDR	0.8238	0.5245	0.7357	0.0561	0.9472	0.7952
RD	0.1210	0.0412	0.1099	0.0323	0.1366	0.0469
FAGE	4.1961	0.6885	4.4821	0.2579	3.7957	0.8790

Table 3. Correlation matrix

	ROA	NIM	NPLR	LOC1	LOC2	LOC3	LOC4	LOC5	LOC6	LOC7	LOC8	LDR	RD	FAGE
ROA	1.0000													
NIM	0.5410	1.0000												
NPLR	0.2806	0.4840	1.0000											
OC1	0.3748	0.5555	0.5003	1.0000										
OC2	0.2595	0.4780	0.4276	0.9384	1.0000									
OC3	0.1950	0.3709	0.3324	0.8531	0.9615	1.0000								
OC4	0.1454	0.3044*	0.2595	0.7588*	0.8881	0.9717	1.0000							
OC5	0.1136	0.2576	0.2087	0.6936	0.8312	0.9368	0.9860	1.0000						
OC6	0.0896	0.2255	0.1740	0.6495	0.7930	0.9083	0.9691	0.9950	1.0000					
OC7	0.0792*	0.2112	0.1599	0.6313	0.7783***	0.8962	0.9612*	0.9903	0.9906	1.0000				
OC8	0.0769	0.2084**	0.1572	0.6285	0.7762	0.8946	0.9602	0.9897*	0.9987	0.9998*	1.0000			
LDR	0.1736	0.1410	0.1462	-0.1566	-0.1491	-0.1127*	-0.0555	-0.0077	0.0056	0.0043	0.0321	1.0000		
RD	0.4200*	-0.2736	0.0601	-0.2698	-0.2077	-0.1502	-0.0928	-0.0471	0.0042*	0.1123	0.0342*	0.2300	1.0000	
FAGE	-0.5475	-0.4615	0.2858	0.3039	0.1988	0.1264	0.0766	0.0302	0.0432	0.2345	0.0432	-0.3410	-0.5742*	1.0000

Significance at the 10% level. ** Significance at the 5% level. ***Significance at the 1% level.

5.3. Discussion of results

5.3.1. Whole sample results

The results reported in [Tables 4, 5, and 6](#) reveal the panel data results of the impact of ownership concentration on bank performance for all banks measured by ROA, NIM, and NPLR. The LM test and Hausman test results conclude that the fixed-effect model estimation is suitable for this analysis. The p -value of F -statistics is significant at the 1 percent level, and thus indicates the fitness of the model. Additionally, the adjusted R^2 provides the percentage of variation reported by the explanatory variables having an impact on the dependent variable. We observe that the beta coefficient of ownership concentration is positively related to ROA and NIM. Our findings are consistent with the findings of Yasser and Al Mamun (2017). The impact of the ownership concentration of the largest shareholder and the top two largest shareholders is positive on the NPLR of all the banks. It shows that large shareholders can influence the management decision in disbursing the loans as a result of which the bad loans of the banks are increasing. For control variables, the impact of loan to deposit ratio is positive on ROA and NIM as well as on NPLR also. The higher loan to deposit ratio is leading to higher ROA, but higher bad assets as well. The impact of revenue diversification is negative on NIM but positive on ROA and NPLR. It suggests that the recent shift of the Indian banks towards non-interest activities from interest-earning activities has reduced the net interest margin. But it has also enhanced the bad assets of the banks. Over a period, the banks' profits are increasing but NPLR is also increasing.

5.3.2. Ownership effect

[Tables 7–12](#) show the estimation results regarding the impact of ownership concentration of private and public sector banks. The higher concentration leads to higher performance in the private sector banks. But, in public sector banks, the higher ownership concentration leads to higher NPLR. Whereas, the impact of the higher ownership concentration is negative on the NPLR of private sector banks. The public sector banks are mainly influenced by Central government decisions since they have a higher stake in it. Additionally, the central government has to undertake various social welfare measures through these public sector banks like priority sector lending which may also lead to higher bad assets. Whereas the private sector banks are established with a profit motive and the large shareholders mostly concentrate on maximizing the profits. Hence in line with this argument, we observe that for private sector banks, the ownership concentration is positively related to ROA and NIM, but negatively associated with the NPLR. The findings related to the control variables are more or less similar to the whole sample results.

5.3.3. Size effect

The Indian banking sector is reasonably large and extensive. The banks vary in size, shareholding pattern, and directors. The size of the bank and governance may be the determining factors of the financial stability of the banks. Magalhaes et al. (2010) showed that ownership concentration helps to increase the risk of small banks. The size of the bank has been measured in terms of the total assets. The large banks also witness higher equity capital which may also lead to higher ownership concentration. In Indian context, the public sector banks are larger in size and also have higher shareholding (ownership concentration) of the government. Hence, we may hypothesize as follows:

H3: All else equal the ownership concentration affects the performance of the banks of different sizes

[Tables 13–18](#) contain the results of regressions on large and small bank subsamples. The sub-sample of large banks includes the ones in which total assets are ranked in the first tercile and the small banks in the lower tercile. We observe that the higher ownership concentration enhances NIM and NPLR also in both banks. Its impact on ROA is insignificant. Similar to the whole sample results, we find that the higher

Table 4. ROA (Fixed effect estimation results for all banks)

Model	1	2	3	4	5	6	7	8	9
OC1	0.0017** (0.0005)		.						0.0089 (0.0019) **
OC2		0.0049 (0.0030)							0.0139 (0.0134)
OC3			0.0048 (0.0028) *						0.0402 (0.0173) **
OC4				0.0048 (0.0026)*					0.0189 (0.0065) **
OC5					0.0448 (0.0025)*				0.0679 (0.0378) *
OC6						0.0047 (0.0024)*			0.1205 (0.0418) **
OC7							0.0046 (0.0024) *		0.1098 (0.0543) **
OC8								0.0046 (0.0024) *	0.0738 (0.1346)
LDR	0.1190 (0.0641)*	0.1166 (0.0638)*	0.1179 (0.0637)*	0.1210 (0.0637) *	0.1255 (0.0638) *	0.1311 (0.0639) **	0.1328 (0.0640) **	0.1334 (0.0640) **	0.1389 (0.0714) *
RD	1.1116 (0.9511)	1.0514 (0.9478)	1.1253 (0.9463)	1.1252 (0.9457)	1.1427 (0.9462)	1.1612 (0.9455)	1.1568 (0.9456)	1.1588 (0.9457)	1.1479 (0.9751)
FAGE	-0.3450 (0.2801)	-0.3128 (0.2773)	-0.2883 (0.2780)	-0.2883 (0.2777)	-0.2851 (0.2781)	-0.2655 (0.2787)	-0.2560 (0.2794)	-0.2561 (0.2795)	-0.1948 (0.3086)
CONSTANT	2.1879 (1.2054)	1.8033 (1.2252)	1.6505 (1.2422)	1.6316 (1.2388)	1.6333 (1.2429)	1.5204 (1.2515)	1.4866 (1.2585)	1.4914 (1.2590)	1.3391 (1.3694)

(Continued)

Table 4. (Continued)

Model	1	2	3	4	5	6	7	8	9
F-TEST	3.12 (0.0000)	3.61 (0.0000)	3.74 (0.0000)	3.83 (0.0000)	3.83 (0.0000)	3.88 (0.0000)	3.88 (0.0000)	3.88 (0.0000)	2.91 (0.0000)
LM TEST (χ^2)	36.57(0.000)	46.50 (0.0000)	50.71 (0.0000)	53.69 (0.0000)	54.62 (0.0000)	55.61 (0.0000)	55.97 (0.0000)	56.10 (0.0000)	29.18 (0.0000)
HAUSMAN TEST (χ^2)	6.33 (0.0075)	10.13 (0.0082)	9.83 (0.0033)	9.75 (0.0048)	9.19 (0.0066)	9.45 (0.0008)	9.24 (0.0055)	9.12 (0.0081)	8.41 (0.0076)
Firm and TimeDummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	324	324	324	324	324	324	324	324	324
Adj-R ²	0.2645	0.2039	0.2151	0.2273	0.2356	0.2260	0.2243	0.3111	0.2761

The table presents the results of regressing ROA on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N) and adjusted-R². The definitions of variables are in Table 1. *, **, *** indicate statistical significance at 10%, 5% and 1% levels, respectively

Table 5. NIM (Fixed effect estimation results for all banks)

Model	1	2	3	4	5	6	7	8	9
OC1	0.0181 (0.0039)***								0.0069 (0.0023)**
OC2		0.0165 (0.0033)***							0.0598 (0.0142)***
OC3			0.0101 (0.0031)**						0.0377 (0.0084)**
OC4				0.0069 (0.0029)**					0.1013 (0.0461)**
OC5					0.0051 (0.0028)*				0.0851 (0.0401)**
OC6						0.0043 (0.0028)			0.0452 (0.0868)
OC7							0.0043 (0.0028)		0.1936 (0.1744)
OC8								0.0044 (0.0028)	0.0344 (0.1429)
LDR	0.1736 (0.0707)**	0.1703 (0.0702)**	0.1622 (0.0719)**	0.1560 (0.0725)**	0.1509 (0.0728)**	0.1470 (0.0731)	0.1451 (0.0732)**	0.1443 (0.07331)*	0.2187 (0.0758)**
RD	-5.4177 (1.0483)***	-5.2881 (1.0431)***	-5.5303 (1.0675)***	-5.5281 (1.0761)***	-5.5473 (1.0804)***	-5.5591 (1.0823)***	-5.5561 (1.0821)***	-5.5585 (1.0821)***	-4.2250 (1.0348)***
FAGE	-3.482 (0.3086)	-0.5609 (0.3052)*	-0.5907 (0.3136)*	-0.5647 (0.3160)*	-0.5565 (0.3175)*	-5.634 (0.3190)*	-0.5740 (0.3198)*	-5.751 (0.3198)*	-0.4898 (0.3275)
CONSTANT	6.1977 (1.3286)***	7.2553 (1.3483)***	7.0460 (1.4013)***	6.7149 (1.4096)***	6.5431 (1.4192)***	6.5011 (1.4326)***	6.5517 (1.4401)***	6.5582 (1.4405)***	6.4856 (1.4533) ***

(Continued)

Table 5. (Continued)

Model	1	2	3	4	5	6	7	8	9
F-TEST	9.70 (0.0000)	10.95 (0.0000)	11.73 (0.0000)	12.21 (0.0000)	12.43 (0.0000)	12.62 (0.0000)	12.71 (0.0000)	12.73 (0.0000)	9.95 (0.0000)
LM TEST	265.06 (0.0000)	309.68 (0.0000)	322.30 (0.0000)	329.16 (0.0000)	331.22 (0.0000)	335.48 (0.0000)	339.38 (0.0000)	340.09 (0.0000)	229.85 (0.0000)
HAUSMAN TEST	8.40 (0.0078)	7.15 (0.0280)	9.82 (0.0435)	11.46 (0.0219)	12.62 (0.0133)	12.90 (0.0118)	12.48 (0.0141)	12.40 (0.0146)	19.55 (0.0520)
Firm and Time Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	324	324	324	324	324	324	324	324	324
ADJ-R2	0.3145	0.3168	0.2278	0.1789	0.1554	0.1477	0.1497	0.1499	0.3694

The table presents the results of regressing NIM on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N), and adjusted-R2. The definitions of variables are in Table 1. *, **, *** indicate statistical significance at 10%, 5% and 1% levels, respectively.

Table 6. NPLR (Fixed effect estimation results for all banks)

Model	1	2	3	4	5	6	7	8	9
OC1	0.1356 (0.0193)***								0.1610 (0.0358)***
OC2		0.0677 (0.0173)***							0.1883 (0.0691)**
OC3			0.0239 (0.0165)						0.1958 (0.0896)**
OC4				0.0047 (0.0153)					0.1032 (0.0856)
OC5					0.0004 (0.0149)				0.1084 (0.1954)
OC6						0.0006 (0.0146)			0.2474 (0.4225)
OC7							0.0004 (0.0146)		0.4465 (0.8484)
OC8								0.0006 (0.0146)	0.2370 (0.6950)
LDR	0.9191 (0.3475)**	0.8472 (0.3664)**	0.8041 (0.3746)**	0.7903 (0.3758)**	0.7900 (0.3762)**	0.7920 (0.3772)**	0.7916 (0.3778)**	0.7923 (0.3780)**	0.9178 (0.3689)**
RD	29.5023 (5.1516)***	29.3294 (5.4399)***	30.3100 (5.5579)***	30.2970 (5.5775)***	30.2961 (5.5789)***	30.2886 (5.5797)***	30.2908 (5.5795)***	30.2889 (5.5796)***	26.3715 (5.0336)***
FAGE	9.0397 (1.5169)***	10.4433 (1.5918)***	10.4173 (1.6329)***	10.2547 (1.6379)***	10.2191 (1.6396)***	10.2056 (1.6449)***	10.2078 (1.6490)***	10.2044 (1.6493)***	7.9030 (1.5930)***
CONSTANT	-47.0625 (6.5288)***	-50.2616 (7.0316)***	-47.3586 (7.2955)***	-45.1327 (7.3064)***	-44.6179 (7.3282)***	-44.4601 (7.3857)***	-44.4897 (7.4255)***	-44.4570 (7.4279)***	-38.2854 (7.0691)***
F-TEST	3.62 (0.0000)	3.17 (0.0000)	3.52 (0.0000)	3.95 (0.0000)	4.20 (0.0000)	4.35 (0.0000)	4.39 (0.0000)	4.40 (0.0000)	4.34 (0.0000)
LM TEST	8.32 (0.0020)	8.54 (0.0017)	12.45 (0.0002)	19.14 (0.0000)	25.30 (0.0000)	29.34 (0.0000)	30.81 (0.0000)	30.94 (0.0000)	10.44 (0.0006)
HAUSMAN TEST	56.67 (0.0000)	41.05 (0.0000)	45.18 (0.0000)	48.31 (0.0000)	47.83 (0.0000)	47.28 (0.0000)	46.84 (0.0000)	46.84 (0.0000)	98.03 (0.0000)
Firm and Time Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	324	324	324	324	324	324	324	324	324
ADJ-R2	0.1948	0.1285	0.0999	0.0910	0.0894	0.0891	0.0892	0.0891	0.2306

The table presents the results of regressing NPLR on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N) and adjusted-R2. The definitions of variables are in Table 1. *, **, *** indicate statistical significance at 10%, 5% and 1% levels, respectively

Table 7. ROA (Fixed effect estimation results for the public sector banks)

Model	1	2	3	4	5	6	7	8	9
OC1	0.0205 (0.0268)								0.0228(0.0306)
OC2		0.0170 (0.0189)							0.0584(0.1228)
OC3			0.0109 (0.0104)						0.0322 (0.0249)
OC4				0.0055 (0.0104)					0.0154 (0.0180)
OC5					0.0302 (0.0143)**				0.1254 (0.0539)**
OC6						0.0387 (0.0151)**			0.3533 (0.1435)**
OC7							0.0042 (0.0151)		0.2685(4.4379)
OC8								0.0031 (0.0150)	0.0421 (1.3718)
LDR	1.7541 (1.0346)*	1.4525 (1.0326)	1.6041 (1.0383)	1.6952 (1.0375)	2.7608 (1.2918)*	1.7343 (1.0309)*	1.7525 (1.0311)*	1.7553 (1.0311)*	1.2753 (1.0094)
RD	2.7656 (1.2928)**	2.7784 (1.2770)**	2.8222 (1.2880)**	2.7745 (1.2901)**	2.7608 (1.2918)**	2.8084 (1.2923)**	2.7816 (1.2928)**	2.7772 (1.2933)**	2.8584 (1.2766)**
FAGE	-3.6801 (1.2059)**	-4.8750 (1.1350)***	-3.9404 (0.9783)***	-3.69134 (0.9411)***	17.8486 (4.3809)***	-3.5857 (0.9330)***	-3.5979 (0.9350)***	-3.6023 (0.9356)***	-3.9365 (1.2508)**
CONSTANT	18.0948 (5.1031)**	21.8705 (4.6653)***	18.1944 (4.2034)***	17.6141 (4.2291)***	17.8486 (4.3809)***	16.833 (4.5673)***	17.3403 (4.6009)***	17.4714 (4.6081)***	16.9058 (5.4500)**
F-TEST	7.41 (0.0023)	6.71 (0.0357)	4.58 (0.00637)	5.54 (0.0046)	3.48 (0.0042)	2.54 (0.0035)	3.52 (0.0082)	5.52 (0.0081)	4.92 (0.0143)
LM TEST	12.0089 (0.0000)	10.0897 (0.0000)	30.0345 (0.0000)	23.9564 (0.0000)	26.6543 (0.0000)	41.9376(0.0000)	32.3423 (0.0000)	63.6543 (0.0000)	48.0802 (0.0043)
HAUSMAN TEST	14.47 (0.0059)	20.29 (0.0004)	17.87 (0.0013)	17.31 (0.0017)	17.17 (0.0018)	18.65 (0.0009)	18.03 (0.0012)	17.94 (0.0013)	16.29(0.0002)
Firm and TimeDummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	189	189	189	189	189	189	189	189	189
ADJ-R2	0.0069	0.0048	0.0061	0.0068	0.0071	0.0070	0.0070	0.0070	0.0117

The table presents the results of regressing ROA on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N) and adjusted-R2. The definitions of variables are in Table 1. *, **, *** indicate statistical significance at 10%, 5%, and 1% levels, respectively

Table 8. NIM (Fixed effect estimation results for the public sector banks)

Model	1	2	3	4	5	6	7	8	9
OC1	0.0016 (0.0061)								0.0045 (0.0097)
OC2		0.0004(0.0081)							0.0225 (0.0208)
OC3			0.0046 (0.0094)						0.0145 (0.0228)
OC4				0.0070 (0.0094)					0.0074 (0.0165)
OC5					0.0034 (0.0128)				0.1064 (0.0192)
OC6						0.0172 (0.0134)			0.3240 (0.2309)
OC7							0.0168 (0.0135)		0.7477 (0.4995)
OC8								0.0172 (0.0134)	0.5543 (0.3392)
LDR	3.1257 (0.9278)**	3.1387 (0.9364)**	3.0801 (0.9338)**	3.0635 (0.9298)**	3.1638 (0.9267)**	3.1997 (0.9210)**	3.1807 (0.9207)**	3.1780 (0.9204)**	3.1741 (.9209)***
RD	-2.2956 (1.1594)**	-2.2793 (1.1580)*	-2.3052 (1.1583)**	-2.2970 (1.1562)**	-2.2673 (1.1585)*	-2.1831 (1.1547)*	-2.1936 (1.1545)*	-2.1856 (1.1545)**	-1.7302 (1.1647)
FAGE	-6.7207 (1.0815)***	-6.8711 (1.0292)***	-6.7677 (0.8798)***	-6.8133 (.8435)***	-6.9162 (0.8371)***	-6.8370 (.8336)***	-6.8179 (0.8350)***	-6.8097 (0.8352)***	-6.6625 (1.1411)***
CONSTANT	30.7680 (4.5766)***	31.3555 (4.2304)***	31.3214 (3.7802)***	31.7803 (3.7903)***	31.1677 (3.9289)***	29.4144 (4.0808)***	29.3734 (4.1085)***	29.3063 (4.1135)***	28.2738 (4.9721)***
F-TEST	10.33 (0.0000)	10.24 (0.0000)	11.23 (0.0000)	11.31 (0.0000)	10.35 (0.0000)	9.68 (0.0000)	9.72 (0.0000)	9.75 (0.0000)	9.06 (0.0000)
LM TEST	78.37 (0.0000)	72.62 (0.0000)	68.45 (0.0000)	53.57 (0.0000)	33.10 (0.0000)	32.91 (0.0000)	34.89 (0.0000)	35.76 (0.0000)	42.26 (0.0000)
HAUSMAN TEST	93.28 (0.0000)	8.35(0.0096)	58.70 (0.0000)	69.25 (0.0000)	70.20 (0.0000)	71.71 (0.0000)	71.75 (0.0000)	71.96 (0.0000)	166.62 (0.0000)
Firm and TimeDummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	189	189	189	189	189	189	189	189	189
ADJ-R2	0.0117	0.0123	0.0119	0.0124	0.0123	0.0109	0.0110	0.0110	0.0093

The table presents the results of regressing NIM on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N), and adjusted-R2. The definitions of variables are in Table 1. *, **, *** indicate statistical significance at 10%, 5%, and 1% levels, respectively

Table 9. NPLR (Fixed effect estimation results for the public sector banks)

Model	1	2	3	4	5	6	7	8	9
OC1	0.0799 (0.0263)**								0.0442 (0.0104)**
OC2		0.1537 (0.0341)***							0.3195 (0.0867)**
OC3			0.0773 (0.0414)*						0.1042 (0.1949)**
OC4				0.1534 (0.0416)**					0.1523 (0.0687)**
OC5					0.0858 (0.0568)				0.0008 (0.2049)
OC6						0.0914 (0.0597)			0.4831 (0.5454)
OC7							0.1041 (0.1596)		1.6202 (1.6639)
OC8								0.1060 (0.1593)	1.2093 (1.4127)
LDR	14.3012 (4.0092)***	12.5498 (3.9213)**	14.2281 (4.1054)**	15.9675 (4.1144)***	15.7597 (4.0866)***	15.6146 (4.0802)***	15.5423 (4.0693)***	15.5263 (4.0672)***	12.9893 (3.8350)**
RD	18.5549 (5.0097)***	17.8981 (4.8493)***	18.1700 (5.0924)***	17.5941 (5.1161)**	17.4437 (5.1088)**	17.2250 (5.1150)**	17.2078 (5.1025)**	17.1584 (5.1014)**	17.6970 (4.8502)***
FAGE	68.6684 (4.6730)***	66.3292 (4.3099)***	75.3966 (3.8678)***	78.3467 (3.7322)***	77.9578 (3.6916)***	77.3004 (3.6928)***	77.1248 (3.6903)***	77.0739 (3.6905)***	64.3607 (4.7521)***
CONSTANT	-301.1456 (19.7751)***	-298.9706 (17.7153)***	-332.7887 (16.6190)***	-332.6694 (16.7710)***	-327.7689 (17.3253)***	-324.244 (18.0772)***	-322.236 (18.1582)***	-321.8171 (18.1762)***	-283.5718 (20.7056)***
F-TEST	22.15 (0.0000)	24.15 (0.0000)	24.38(0.0000)	26.57 (0.0000)	26.85 (0.0000)	25.39 (0.0000)	25.19 (0.0000)	25.14 (0.0000)	23.45 (0.0000)
LM TEST	8.04 (0.0023)	6.88 (0.0044)	9.46(0.0024)	10.03 (0.0004)	9.09 (0.0024)	10.61 (0.0021)	8.76 (0.0019)	11.77 (0.0019)	15.09 (0.0001)
HAUSMAN TEST	118.82 (0.0000)	148.49 (0.0000)	403.72(0.0000)	499.31 (0.0000)	502.25 (0.0000)	478.34 (0.0000)	473.64 (0.0000)	472.38 (0.0000)	740.44 (0.0000)
Firm and TimeDummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	189	189	189	189	189	189	189	189	189
ADJ-R2	0.0006	0.0011	0.0001	0.0000	0.0000	0.0000	0.0001	0.0001	0.0016

The table presents the results of regressing NPLR on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N) and adjusted-R2. The definitions of variables are in Table 1. *, **, *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

Table 10. ROA (Fixed effect estimation results for the private sector banks)

Model	1	2	3	4	5	6	7	8	9
OC1	0.0119 (0.0041)**								0.0179 (0.0091)*
OC2		0.0066 (0.0029)**							0.0355 (0.0154)**
OC3			0.0052 (0.0025)**						0.0191 (0.0022)**
OC4				0.0050 (0.0023)**					0.0203 (0.0043)**
OC5					0.0047 (0.0022)**				0.0172 (0.0041)**
OC6						0.0046 (0.0022)**			0.1599 (0.0528)**
OC7							0.0047 (0.0021)**		0.2869 (0.0609)**
OC8								0.0046 (0.0021)**	0.1531 (0.0269)**
LDR	0.1355 (0.0581)**	0.1476 (0.0585)**	0.1521 (0.0586)**	0.1561 (0.0585)**	0.1613 (0.0585)**	0.1665 (0.0587)**	0.1686 (0.0587)*	0.1693 (0.0587)**	0.1238 (0.0670)*
RD	2.7520 (1.4931)*	2.9881 (1.5083)*	2.9323 (1.5158)*	2.9583 (1.5131)*	2.9663 (1.5138)*	2.9498 (1.5142)*	2.9556 (1.5125)*	2.9532 (1.5129)*	3.2178 (1.5341)**
FAGE	-0.1903 (0.2590)	-0.1474 (0.2644)	-0.1579 (0.2653)	-0.1700 (0.2641)	-0.1717 (0.2642)	-0.1580 (0.2650)	-0.1457 (0.2654)	-0.1455 (0.2655)	-0.0332 (0.2910)
CONSTANT	1.9900 (1.1045)*	1.9235 (1.1383)*	1.9733 (1.1457)*	2.0080 (1.1369)*	2.0218 (1.1368)*	1.9691 (1.1436)*	1.9118 (1.1477)*	1.9131 (1.1482)*	1.3650 (1.2475)

(Continued)

Table 10. (Continued)

Model	1	2	3	4	5	6	7	8	9
F-TEST	6.53 (0.0000)	6.37 (0.0000)	6.34 (0.0000)	6.53 (0.0000)	6.61 (0.0000)	6.69 (0.0000)	6.76 (0.0000)	6.76 (0.0000)	6.78 (0.0000)
LM TEST	57.17 (0.0000)	51.53 (0.0000)	52.55 (0.0000)	56.67 (0.0000)	57.97 (0.0000)	58.79 (0.0000)	59.41 (0.0000)	59.34 (0.0000)	41.82 (0.0000)
HAUSMAN TEST	4.44 (0.0034)	5.77 (0.0021)	5.25 (0.0026)	4.77 (0.0031)	4.71 (0.0031)	4.84 (0.0033)	5.00 (0.0028)	5.00 (0.0028)	6.04 (0.0008)
Firm and Time Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	135	135	135	135	135	135	135	135	135
ADJ-R2	0.1345	0.0440	0.0514	0.0610	0.0600	0.0437	0.0322	0.0320	0.0001

The table presents the results of regressing ROA on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N) and adjusted-R2. The definitions of variables are in Table 1. *, **, *** indicate statistical significance at 10%, 5%, and 1% levels, respectively

Table 11. NIM (Fixed effect estimation results for the private sector banks)

Model	1	2	3	4	5	6	7	8	9
OC1	0.0122 (0.0058)**								0.0196 (0.0019)**
OC2		0.0127 (0.0039)**							0.0845 (0.0203)**
OC3			0.0077 (0.0035)**						0.0489 (0.0292)**
OC4				0.0054 (0.0032)*					0.0258 (0.0053)**
OC5					0.0046 (0.0031)				0.0545 (0.0711)
OC6						0.0043 (0.0030)			0.0717 (0.1220)
OC7							0.0043 (0.0030)		0.0450 (0.2115)
OC8								0.0044 (0.0030)	0.0828 (0.1668)
LDR	0.1633 (0.0821)**	0.1598 (0.0797)**	0.1488 (0.0814)*	0.1423 (0.0820)*	0.1370 (0.0822)*	0.1322 (0.0824)	0.1305 (0.0825)	0.1296 (0.0825)	0.1671 (0.0882)*
RD	-5.9418 (2.1104)**	-5.7756 (2.0548)**	-5.8204 (2.1033)**	-5.7396 (2.1198)**	-5.7194 (2.1249)**	-5.7309 (2.1269)**	-5.7232 (2.1265)**	-5.7274 (2.1261)**	-4.5894 (2.0169)**
FAGE	-0.0519 (0.3661)	-0.0648 (0.3601)	-0.0130 (0.3682)	-0.0268 (0.3700)	-0.0350 (0.3709)	-0.0242 (0.3723)	-0.0141 (0.3732)	-0.0126 (0.3731)	-0.1582 (0.3826)
CONSTANT	4.6615 (1.5612)**	5.3580 (1.5508)**	4.9728 (1.5899)**	4.6894 (1.5927)**	4.6084 (1.5957)**	4.6347 (1.6064)**	4.6755 (1.6136)**	4.6860 (1.6137)**	5.2174 (1.6401)**
F-TEST	10.41 (0.0000)	11.47 (0.0000)	10.85 (0.0000)	10.54 (0.0000)	10.44 (0.0000)	10.41 (0.0000)	10.42 (0.0000)	10.43 (0.0000)	9.39(0.0000)
LM TEST	115.55 (0.0000)	124.43 (0.0000)	115.05 (0.0000)	114.03 (0.0000)	113.83 (0.0000)	113.76 (0.0000)	113.67 (0.0000)	113.66 (0.0000)	55.42(0.0000)
HAUSMAN TEST	4.99(0.0028)	5.21(0.0026)	5.61(0.0023)	5.19(0.0026)	5.02(0.0028)	4.88(0.0029)	4.85(0.0031)	4.86(0.0301)	15.16(0.0000)
Firm and TimeDummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	135	135	135	135	135	135	135	135	135
ADJ-R2	0.0479	0.0233	0.0471	0.0541	0.0556	0.0530	0.0509	0.0508	0.0174

The table presents the results of regressing NIM on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N) and adjusted-R2. The definitions of variables are in Table 1. *, **, *** indicate statistical significance at 10%, 5%, and 1% levels, respectively

OC1	-0.0130 (0.0031)**											
OC2	-0.0189 (0.0088)**											
OC3												
OC4												
OC5												
OC6												
OC7												
OC8												
LDR	0.1341 (0.1819)	0.1296 (0.1781)	0.1453 (0.1794)	0.1559 (0.1802)	0.1631 (0.1805)	0.1680 (0.1811)	0.1696 (0.1813)	0.1703 (0.1814)				
RD	3.2075 (4.6714)	3.3174 (4.5900)	3.2302 (4.6344)	3.3810 (4.6588)	3.4177 (4.6652)	3.4233 (4.6711)	3.4370 (4.6714)	3.4337 (4.6715)				
FAGE	2.1807 (0.8104)**	1.9895 (0.8045)**	2.0564 (0.8112)**	2.1316 (0.8133)**	2.1475 (0.8144)**	2.1454 (0.8176)**	2.1372 (0.8198)**	2.1365 (0.8199)**				
CONSTANT	-7.1725 (3.4556)**	-5.8587 (3.4641)*	-6.3377 (3.5031*)	-6.9106 (3.5003)*	-7.0713 (3.5033)*	-7.1487 (3.5278)**	-7.1320 (3.5446)**	-7.1285 (3.5456)**				
F-TEST	4.46 (0.0000)	4.83 (0.0000)	4.62 (0.0000)	4.48 (0.0000)	4.44 (0.0000)	4.41 (0.0000)	4.41 (0.0000)	4.41 (0.0000)				

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Table 12. (Continued)

LM TEST	27.41 (0.0000)	29.11 (0.0000)	27.99 (0.0000)	27.15 (0.0000)	27.15 (0.0000)	27.14 (0.0000)	27.33 (0.0000)	27.36 (0.0000)	14.81 (0.0001)
HAUSMAN TEST	6.07 (0.0019)	7.69 (0.0013)	6.60 (0.0015)	6.10 (0.0018)	5.85 (0.0004)	5.65 (0.0022)	5.51 (0.0023)	5.49 (0.0024)	19.85 (0.0047)
Firm and Time Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	135	135	135	135	135	135	135	135	135
ADJ-R2	0.0866	0.0868	0.0862	0.0857	0.0859	0.0860	0.0862	0.0862	0.1019

The table presents the results of regressing NPLR on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N) and adjusted-R2. The definitions of variables are in Table 1. *, **, *** indicate statistical significance at 10%, 5%, and 1% levels, respectively

Table 13. ROA (Fixed effect estimation results for the large banks)

OC1	0.0066 (0.0024)**									0.0304 (0.0135)**
OC2		0.0026 (0.0056)								0.0296 (0.0261)
OC3			0.0008 (0.0079)							0.0087 (0.0313)
OC4				0.0017 (0.0083)						0.0076 (0.0208)
OC5						0.0018 (0.0096)				0.0624 (0.0607)
OC6							0.0027 (0.0084)			0.0513 (0.0922)
OC7								0.0019 (0.0081)		0.1194 (0.3921)
OC8									0.0020 (0.0081)	0.1327 (0.3690)
LDR	0.8243 (.6030)	0.8565 (0.6116)	0.9043 (0.6277)	0.9193 (0.6252)	0.9153 (0.6235)	0.9196 (0.6155)	0.8962 (0.6092)	0.8955 (0.6090)	0.9535 (0.7630)	
RD	1.9206 (1.4840)	2.5855 (1.4436)*	2.8040 (1.4049)**	2.7552 (1.3886)*	2.7035 (1.4360)*	2.6257 (1.4600)*	2.6559 (1.4767)**	2.6539 (1.4745)*	1.5872 (1.7486)	
FAGE	-0.3350 (0.1098)**	-0.3889 (0.1108)**	-0.4206 (0.1188)**	-0.4284 (0.1195)**	-0.4288 (0.1240)**	-0.4351 (0.1172)**	-0.4271 (0.1126)**	-0.4274 (0.1124)**	-0.2851 (0.1532)*	
CONSTANT	3.0133 (0.8327)***	2.9678 (0.8613)**	2.8385 (0.8933)**	2.7968 (0.9052)**	2.7856 (0.9410)**	2.7359 (0.9313)**	2.7605 (0.9552)**	2.7550 (0.9597)**	2.9732 (1.1294)**	
F-TEST	6.53 (0.0011)	5.69 (0.0009)	7.76 (0.0009)	8.76 (0.0003)	8.76 (0.0001)	9.74 (0.0006)	6.75 (0.0007)	10.75 (0.0001)	11.19 (0.0001)	
LM TEST	10.49 (0.0024)	10.96 (0.0016)	11.24 (0.0013)	11.24 (0.0013)	11.25 (0.0013)	10.04 (0.0012)	21.07 (0.0001)	12.03 (0.0003)	10.00 (0.0032)	
HAUSMAN TEST	13.12 (0.0023)	12.63 (0.0032)	11.90 (0.0075)	14.17 (0.0018)	10.50 (0.0021)	10.96 (0.0015)	11.06 (0.0001)	11.16 (0.0018)	19.95 (0.0000)	
Firm and Time Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	108	108	108	108	108	108	108	108	108	108
ADJ-R2	0.4372	0.4183	0.4148	0.4146	0.4329	0.4163	0.4158	0.4158	0.4827	

The table presents the results of regressing ROA on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N) and adjusted-R2. The definitions of variables are in Table 1. *, **, *** indicate statistical significance at 10%, 5%, and 1% levels, respectively

OC1		0.0279 (0.0062)**										
OC2		0.0356 (0.0077)***										
OC3				0.0381 (0.0115)**								
OC4					0.0434 (0.0120)***							
OC5						0.0458 (0.0138)**						
OC6							0.0355 (0.0124)**					
OC7								0.0350 (0.0119)**				
OC8									0.0350 (0.0119)**			
LDR	0.5459 (0.8465) -1.4532(2.0833)	0.3813 (0.8452) -2.4159(1.9949)	0.0780 (0.9070)	0.0667(0.8944)	0.1627 (0.9009)	0.4170 (0.9014)	0.6736 (0.8902)	0.6909 (0.8903)	0.6995 (0.9733)			
RD			-3.8992 (2.0300)**	-5.6246 (1.9862)*	-6.8726 (2.0749)**	-6.9989 (2.1383)**	-7.2525 (2.1578)**	-7.2165 (2.1555)**	-2.4071 (2.2306)			
FAGE	-0.1604 (0.1541)	-0.1537 (0.1532)	-0.1652 (0.1717)	-0.1310 (0.1710)	-0.1230 (0.1792)	-0.2162 (0.1716)	-0.2471(0.1646)	-0.2502 (0.1643)	0.1387(0.1954)			
CONSTANT	5.3981 (1.1690)***	6.1179 (1.1902)***	6.2934 (1.2907)***	6.5918 (1.2948)**	6.8602 (1.3597)***	6.5200 (1.3640)***	6.7783 (1.3958)**	6.8102 (1.4029)***	8.0228 (1.4408)***			
F-TEST	11.13(0.0035)	11.32(0.0024)	11.68(0.0011)	11.86(0.0007)	12.19(0.0003)	12.26(0.0002)	12.33(0.0002)	9.33(0.0002)	11.59(0.0001)			
LM TEST	23.45(0.0000)	32.24(0.0000)	43.32(0.0000)	41.67(0.0000)	26.54(0.0000)	27.43(0.0000)	34.54(0.0000)	54.35(0.0000)	45.08(0.0000)			

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Table 14. (Continued)											
HAUSMAN TEST	7.29(0.0081)	8.06(0.0009)	17.59(0.0015)	22.97(0.0001)	31.23(0.0000)	25.89(0.0000)	28.62(0.0000)	29.07(0.0000)	30.78(0.0000)		
Firm and TimeDummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	108	108	108	108	108	108	108	108	108	108	108
ADJ-R2	0.4837	0.4811	0.4155	0.4184	0.3878	0.3645	0.3617	0.3617	0.3617	0.5784	

The table presents the results of regressing NIM on ownership concentration variables The table reports the regression coefficients, standard error (in parentheses), number of observations (N) and adjusted-R2. The definitions of variables are in Table 1. *, **, *** indicate statistical significance at 10%, 5%, and 1% levels, respectively

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The table presents the results of regressing NPLR on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N) and adjusted-R2. The definitions of variables are in Table 1. *, **, *** indicate statistical significance at 10%, 5%, and 1% levels, respectively

Table 16. ROA (Fixed effect estimation results for the small banks)

OC1	0.0123 (0.0025)**									0.0186 (0.0079)**
OC2		0.0004 (0.0024)								0.0054(0.0213)
OC3			0.0011 (0.0023)							0.0530(0.0357)
OC4				0.0009 (0.0022)						0.0130(0.0587)
OC5								(0.0008) (0.0021)		0.1530(0.1030)
OC6								0.0208 (0.0020)**		0.2885 (0.1531)*
OC7									0.0008(0.0020)	0.3888(0.2522)
OC8									0.0008(0.0020)	0.2087(0.1996)
LDR	0.0381 (0.0615)	0.0325 (0.0621)	0.0311 (0.0617)	0.0331 (0.0615)	0.0343 (0.0615)	0.0352 (0.0616)	0.0354(0.0617)	0.0355(0.0617)	0.0057(0.0732)	
RD	1.7898(1.7350)	2.1621 (1.7519)	2.2724 (1.7449)	2.2345 (1.7378)	2.2163 (1.7360)	2.2171(1.7346)	2.2112(1.7347)	2.2125(1.7348)	2.3804(1.6818)	
FAGE	-0.2623 (0.0933)**	-0.2382 (0.0960)**	-0.2292 (0.0955)**	-0.2328 (0.0944)**	-0.2343 (0.0940)**	-0.2341 (0.0940)**	-0.2345 (0.0941)**	-0.2343 (0.0941)**	-0.1386 (0.1005)	
CONSTANT	2.0108 (0.5598)**	1.7419 (0.6032)**	1.634329 (0.6070)**	1.6626 (0.5961)**	1.6783 (0.5927)**	1.6757 (0.5912)**	1.6810 (0.5918)**	1.6795 (0.5925)**	1.1152 (0.6254)*	
F-TEST	10.58(0.0007)	10.59(0.0007)	10.59(0.0007)	10.58(0.0007)	10.58(0.0007)	10.58(0.0007)	10.58(0.0007)	10.58(0.0007)	10.97(0.0004)	
LM TEST	43.23 (0.0000)	34.00(0.0000)	21.32(0.0000)	19.87(0.0000)	18.45(0.0000)	35.67 (0.0000)	32.23(0.0000)	45.02(0.0000)	23.42(0.0000)	
HAUSMAN TEST	13.21 (0.0012)	13.34(0.0020)	13.36(0.0049)	13.31(0.0034)	13.31(0.0032)	13.31 (0.0041)	13.31 (0.0036)	13.31 (0.0032)	17.57 (0.0027)	
Firm and TimeDummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	108	108	108	108	108	108	108	108	108	108
ADJ-R2	0.1786	0.1706	0.1723	0.1724	0.1722	0.1722	0.1720	0.1720	0.1720	0.2559

The table presents the robustness test results of regressing ROA on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N) and adjusted-R2. The definitions of variables are in Table 1. *, **, *** Indicate statistical significance at 10%, 5% and 1% levels, respectively

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Table 17. (Continued)

LM TEST	20.03 (0.0000)	32.34 (0.0000)	13.23 (0.0000)	20.04 (0.0000)	14.05 (0.0000)	21.23 (0.0000)	13.93 (0.0000)	14.52(0.0000)	13.45(0.0000)
HAUSMAN TEST	11.85 (0.0215)	12.20 (0.0006)	11.81 (0.0007)	11.38 (0.0084)	11.31 (0.0025)	11.32 (0.0015)	11.30 (0.0036)	11.30(0.0046)	16.57(0.0013)
Firm and Time Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	108	108	108	108	108	108	108	108	108
ADJ-R2	0.4288	0.3513	0.2687	0.2322	0.2157	0.2059	0.2028	0.2028	0.5146

The table presents the robustness test results of regressing ROA on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N) and adjusted-R2. The definitions of variables are in Table 1. . , * , ** , *** indicate statistical significance at 10%, 5% and 1% levels, respectively

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Table 18. (Continued)

LM TEST	10.05 (0.0000)	33.05 (0.0000)	27.42 (0.0000)	27.50 (0.0000)	26.56 (0.0000)	25.56 (0.0000)	25.19 (0.0000)	25.10 (0.0000)	10.03 (0.0000)
HAUSMAN TEST	30.40 (0.0000)	38.13 (0.0000)	90.69 (0.0000)	60.93 (0.0000)	46.78 (0.0000)	33.84 (0.0000)	31.43 (0.0000)	30.16 (0.0000)	21.59 (0.0078)
Firm and Time Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	108	108	108	108	108	108	108	108	108
ADJ-R2	0.3711	0.1884	0.1301	0.0890	0.0708	0.0626	0.0582	0.0575	0.4893

The table presents the robustness test results of regressing ROA on ownership concentration variables. The table reports the regression coefficients, standard error (in parentheses), number of observations (N) and adjusted-R2. The definitions of variables are in Table 1. *, ***, **** indicate statistical significance at 10%, 5% and 1% levels, respectively

ownership concentration is helpful in improving the NIM, but it increases the NPLR as well. The findings related to the control variables are more or less similar to the whole sample results.

5.3.4. Robustness test

5.3.4.1. *Endogeneity concern (Generalized method of moments (GMM) estimation results).* We employ the System Generalized Method of Moments (SGMM) estimators established by Arellano and Bover (1995) and Blundell and Bond (1995) to solve the endogeneity problem (Blundell & Bond, 1998). For panel data, the SGMM concurrently accounts for unobserved heterogeneity, endogeneity, and heteroskedasticity of the explanatory factors (Andres & Vallelado, 2008). In addition, the SGMM helps us to tackle the problem of ownership structure and company value simultaneity (Demsetz & Villalonga, 2001). The application of GMM takes care of the problem of heterogeneity by taking the first differences and thereby eliminating the individual effect, which makes the results unbiased. The estimation process includes the lagged explanatory variables as instruments, which allows for additional instruments by taking advantage of the conditions of orthogonality existing between the lags in the independent variables of the model (Arellano & Bond, 1991). We apply the Arellano–Bond test for autocorrelation, sargan test for over-identifying restrictions, and the Wald test for the joint significance of the estimated coefficients for all the variables. The value of the sargan test (J-statistics) confirms that the instruments are valid. We use the AR (1) autoregressive process, in which the current value is based on the immediately preceding value, while an AR (2) process is one in which the current value is based on the previous two values.” We present system estimator regression results in Tables 19–21. We find more or less similar results after conducting the robustness test by estimating the purposed model through the Generalized Method of Moments (GMM) technique.

6. Conclusion

This present study examines the relationship between ownership concentration and bank performance in a sample of 36 banks operating in the Indian banking sector from 2010 to 2019. For achieving this objective, we estimate several data models using the fixed effects estimation technique. Our research highlights the fact that ownership concentration plays a central role in the governance of Indian banks and these structures also determine the performance of these banks. Our results indicate that ownership concentration has a significant and positive impact on bank performance. Conversely, to the aforementioned theoretical assumptions that the largest shareholder may misappropriate the banks’ wealth, our findings reveal that the largest shareholding has a positive effect. Empirically, our results are consistent with those of Nishizaki and Kurasawa (2002) and Wiwattanakantang (2001). However, they are inconsistent with those of Omran et al. (2008) and Deb and Chaturvedula (2003). Regarding the control variables, the loan to deposit ratio and bank age have a negative influence on bank performance, while the influence of revenue diversification is positive.

There are a number of policy implications related to our study. Given the vital role and importance of banking governance in the economy, we think effective governance is a challenge in Indian banks. The Indian banking sector is still dominated by state banks and privatizing these institutions is recommended in order to ameliorate their performance. Besides, even in the cases where the presence of state banks may be sustained, the governance structure of these banks must be reviewed and authorities should minimize political interference and avoid credit misallocation. The policy regulators of banks in India may help in boosting their efforts of increasing the efficiency of the capital markets and protecting investors and may help in augmenting the understanding of ownership structure in the Indian banks. Our findings may assist investors in formulating their investment strategies. Recently, the government of India is trying to attract investors and improve the efficiency of the banks by merging some of the public sector banks. The central government has also provided guidelines regarding the dilution of ownership in private sector banks. Now in the private sector banks, the promoter’s shareholding cannot be more than 15%.

Table 19. ROA (GMM estimation results for the whole sample)

Model	1	2	3	4	5	6	7	8	9
L1	0.445 (0.003)***	0.443 (0.003)***	0.447 (0.003)***	0.446 (0.002)***	0.448 (0.004)***	0.448 (0.005)***	0.447 (0.005)***	0.447 (0.005)***	0.362 (0.050)***
OC1	0.0008 (0.0001)***								0.0001(0.002)
OC2		0.0001(0.0001)							0.012 (0.004)**
OC3			0.002 (0.0001)***						0.004 (0.002)**
OC4				0.001 (0.0001)***					0.005 (0.003)*
OC5					0.002 (0.0001)***				0.034 (0.011)**
OC6						0.002 (0.0001)***			0.064(0.029)**
OC7							0.002 (0.0001)***		0.032 (0.009)**
OC8								0.002 (0.0001)***	0.009 (0.004)**
LDR	0.091 (0.008)***	0.090 (0.008)***	0.096 (0.010)***	0.089 (0.010)***	0.089 (0.010)***	0.088 (0.010)***	0.087 (0.010)***	0.086 (0.010)***	0.060 (0.010)***
RD	(0.654) (0.229)**	0.771(0.565)	1.036 (0.399)**	0.732 (0.360)**	0.800 (0.346)**	0.766 (0.304)**	0.776 (0.304)**	0.769 (0.298)**	-0.086 (0.863)
FAGE	-0.617 (0.095)***	-0.622 (0.096)***	-0.703 (0.078)***	-0.626 (0.098)***	-0.606 (0.114)***	-0.613 (0.120)***	-0.620 (0.124)***	-0.624 (0.126)***	-0.805 (0.368)**

(Continued)

Table 19. (Continued)

Model	1	2	3	4	5	6	7	8	9
CONSTANT	3.018 (0.398)***	3.046 (0.400)***	3.555 (0.328)***	3.257 (0.421)***	3.219 (0.504)***	3.238 (0.535)***	3.274 (0.556)***	3.291 (0.561)***	4.060 (1.595)**
N	252	252	252	252	252	252	252	252	252
Number of banks	36	36	36	36	36	36	36	36	36
Wald-test (χ^2)	39665.73 (0.0000)	49184.96 (0.0000)	23037.37 (0.0000)	42097.57 (0.0000)	31642.51 (0.0000)	28040.63 (0.0000)	27199.82 (0.0000)	27743.54 (0.0000)	3253.56(0.0000)
Sargan test (p-value)	0.1758	0.1669	0.1818	0.1937	0.216	0.2139	0.2616	0.2165	0.5289
AB Test AR(1) (p-value)	0.1001	0.4001	0.5001	0.3001	0.1981	0.6501	0.8713	0.4514	0.2304
AB Test AR(2) (p-value)	0.2469	0.2428	0.2395	0.2363	0.2381	0.2383	0.2395	0.2387	0.3229

The table presents the results of the two-step system GMM estimate of regressing ROA on ownership concentration variables. The sargan test statistics is the test of over-identifying restrictions. The definitions of variables are in Table 1. Figures in parenthesis are t-statistics of regression coefficients while p-values are in brackets. * Statistical significance at 10% level. ** Statistical significance at 5% level. *** Statistical significance at 1% level.

Table 20. NIM (GMM estimation results for the whole sample)

Model	1	2	3	4	5	6	7	8	9
L1	0.647 (0.020)***	0.654 (0.020)***	0.689 (0.016)***	0.710 (0.013)***	0.711 (0.012)***	0.710 (0.012)***	0.710 (0.012)***	0.710 (0.012)***	0.567 (0.035)***
OC1	0.004 (0.0001)***								0.011 (0.002)***
OC2		0.005 (0.001)***							0.021 (0.003)***
OC3			0.003 (0.0001)***						0.008 (0.004)*
OC4				0.001(0.001)					0.012 (0.002)***
OC5					0.001 (0.0001)**				0.031 (0.013)**
OC6						0.002 (0.001)**			0.018 (0.002)**
OC7							0.002 (0.001)**		0.136 (0.044)**
OC8								0.002 (0.001)**	-0.143 (0.033)***
LDR	0.008(0.025)	0.023(0.030)	0.001(0.029)	0.003(0.028)	0.006(0.028)	0.006(0.028)	0.006(0.028)	0.006(0.028)	0.040(0.027)
RD	-0.695 (0.341)**	-0.582 (0.306)**	-0.673 (0.213)**	-0.739 (0.168)***	-0.724 (0.192)***	-0.692 (0.195)***	-0.691 (0.194)***	-0.691 (0.194)***	-0.499 (0.476)
FAGE	-0.048 (0.054)	-0.053 (0.067)	-0.076 (0.029)**	-0.062 (0.027)**	-0.082 (0.031)**	-0.092 (0.036)**	-0.091 (0.036)**	-0.090 (0.036)**	-0.138 (0.177)

(Continued)

Table 20. (Continued)

Model	1	2	3	4	5	6	7	8	9
CONSTANT	1.035 (0.233)***	1.581 (0.355)***	1.439 (0.187)***	1.148 (0.199)***	1.288 (0.217)***	1.363 (0.240)***	1.355 (0.240)***	1.341 (0.239)***	2.315(0.780)
N	252	252	252	252	252	252	252	252	252
Number of banks	36	36	36	36	36	36	36	36	36
Wald-test (χ^2)	2844.31(0.000)	5105.90(0.000)	15907.68(0.000)	35478.79(0.000)	38020.01(0.000)	38091.25(0.000)	39815.56(0.000)	40032.90(0.000)	18648.80(0.000)
Sargan test (p-value)	0.3342	0.3403	0.3226	0.2992	0.2902	0.2923	0.2942	0.2942	0.3962
AB Test AR(1) (p-value)	0.0693	0.0535	0.0517	0.0579	0.0571	0.0674	0.0676	0.0778	0.1509
AB Test AR(2) (p-value)	0.0689	0.0657	0.0635	0.0523	0.0531	0.0538	0.0526	0.0524	0.0952

The table presents the results of the two-step system GMM estimate of regressing ROA on ownership concentration variables. sargan test statistics is the test of over-identifying restrictions. The definitions of variables are in Table 1. Figures in parenthesis are t-statistics of regression coefficients while p-values are in brackets. * Statistical significance at 10% level. ** Statistical significance at 5% level. *** Statistical significance at 1% level.

Table 21. NPLR (GMM estimation results for the whole sample)

Model	1	2	3	4	5	6	7	8	9
L1	0.754(0.022)***	0.733(0.014)***	0.743(0.017)***	0.743(0.018)***	0.744(0.017)***	0.744(0.017)***	0.744(0.017)***	0.744(0.017)***	0.683(0.051)***
OC1	0.006(0.002)**								0.091(0.017)***
OC2		0.018(0.004)***							0.214(0.037)***
OC3			0.001(0.003)						0.137(0.022)
OC4				0.005(0.002)*					0.035(0.015)**
OC5					0.006(0.002)**				0.029(0.007)**
OC6						0.007(0.003)**			0.143(0.067)**
OC7							0.007(0.003)**		1.093(0.229)***
OC8								0.007(0.003)**	0.970(0.218)***
LDR	0.205(0.150)	0.208(0.148)	0.219(0.150)	0.227(0.148)	0.232(0.148)	0.241(0.149)	0.244(0.150)	0.246(0.149)	0.451(0.115)***
RD	20.838 (1.153)***	20.685 (1.211)***	21.060 (1.434)***	21.242 (1.525)***	21.176 (1.504)***	21.288 (1.492)***	21.353 (1.511)***	21.336 (1.510)***	26.681 (5.364)***
FAGE	6.857 (1.073)***	6.520 (1.030)***	6.706 (1.093)***	6.670 (1.114)***	6.582 (1.129)***	6.485 (1.151)***	6.503 (1.128)***	6.493 (1.123)***	8.389 (1.282)***
CONSTANT	-29.900 (5.052)***	-29.911 (4.921)***	-29.747 (5.189)***	-28.975 (5.281)***	-28.493 (5.366)	-28.016 (5.468)***	-28.106 (5.360)***	-28.012 (4.345)***	-36.002 (6.236)***
N	252	252	252	252	252	252	252	252	252
Number of banks	36	36	36	36	36	36	36	36	36
Wald-test (χ^2)	10545.76 (0.000)	10621.02 (0.000)	10435.85(0.000)	11065.51 (0.000)	11575.76 (0.000)	12106.32(0.000)	12874.13(0.000)	12969.42(0.000)	15670.92(0.000)

(Continued)

Table 21. (Continued)

Model	1	2	3	4	5	6	7	8	9
Sargan test (p-value)	0.2313	0.2264	0.2265	0.2367	0.2328	0.2309	0.2252	0.2273	0.4303
AB Test AR(1) (p-value)	0.2356	0.3245	0.6543	0.3423	0.1231	0.3421	0.4232	0.2324	0.3425
AB Test AR(2) (p-value)	0.2072	0.1934	0.1956	0.1888	0.1889	0.1882	0.1893	0.1884	0.3975

The table presents the results of the two-step system GMM estimate of regressing ROA on ownership concentration variables, sargan test statistics is the test of over-identifying restrictions. The definitions of variables are in Table 1. Figures in parenthesis are t-statistics of regression coefficients while p-values are in brackets. * Statistical significance at 10% level. ** Statistical significance at 5% level. *** Statistical significance at 1% level.

Although we have conducted several robustness tests, some limitations are likely to be considered in interpreting the results conducted in this study. First, our sample consists of public and private sector banks, and thus, it may not apply to foreign banks operating in India. Second, the data is hand collected and is limited to nine years only. Hence the longer-term effects of ownership concentration on bank performance cannot be studied based on this data. Additionally, a possible extension of the study may be to examine the impact of the board of directors and other governance variables on Indian bank performance. We contribute to the literature on economics and finance. It enriches the subject knowledge by providing evidence from an emerging economy like India. Finally, we conclude that ownership concentration plays an important role in Indian banks' performance.

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